



Dr. Babasaheb Ambedkar Open University

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DMA-102
Digital Imaging



Diploma in Multimedia and Animation (DMA)

2020

Digital Imaging

Dr. Babasaheb Ambedkar Open University



Digital Imaging

Editor

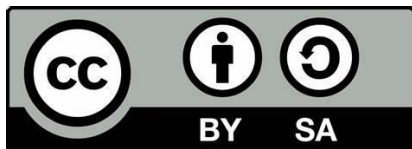
Dr. Himanshu Patel

Assistant Professor, School of Computer Science

Dr. Babasaheb Ambedkar Open University, Ahmedabad

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Digital Imaging

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Unit-1 Introduction to Graphics Design

Introduction

Today due to technological advancement and improved tools in computer software programs almost every computer and Smartphone is equipped with capability to perform some effects of graphics. Now even common people can perform some creative tasks easily on their devices, in many cases so good that they look to have been done by professionals.

Creating meaningful and effective graphic visuals for television requires very simple but specific design that communicates the message to the audience / viewer straight as the diverse audience has different understanding levels. Sometime, what you are viewing neatly and easily readable on your computer or laptop, may look clumsy and difficult to be read on television screen. So one has to be careful, while producing any graphics that will be viewed properly on a TV screen too besides a Smartphone. In short, graphics shall be prepared in such a manner so they can be easily readable and understood by TV viewing audiences within short time. People are easily discouraged by reading rapid graphics. Hence we can say that the key for all appealing visuals lies in their simplicity and boldness.

Outcomes

Upon completion of this unit you will be able to:

- Describe Evolution of Computer Graphics;
- Use Digital technology in Graphics;
- State the Principles of Graphic Design;
- Explain the Fundamentals of Computer Graphics and
- Prepare Print Graphics and TV Graphics

Terminology

Broadcast: Program transmitted from Radio or Television

Computer Graphics: Designs, Art or Illustrations created through computer

Chroma Key: A technique used in removing a particular colour (blue or green) from video image and replaced by another image or colour.

Clipart: Readymade simple icons, pictures, logos etc. available for use in computer designs

Graphics

What does the term “Graphics” stands for?

A graphics is an image or visual representation of any object. It can be a Map, Sketch or Picture that was produced using various techniques of paintings, i.e. etchings, engravings and lithographs. Later on as the technology developed, drawing and painting techniques gradually transformed into new avatars and this fusion came to be known as ‘**Computer Graphics**’ later. It is the stage when imagery based graphics are created without pigment colours and paper. It is not only an interesting method but also a more convenient way to create art works. Even on this media one can work like a traditional artist and with much more precision and possibility of corrections.

It would have been interesting to see whether the old great masters in the history of world art, like **Salvador Dali** or **Van Gogh** were alive today, would they still paint canvas using pigment colours and use charcoal or pencil to draw on a sketchpad or sit on their PC holding a mouse or a Graphics Tablet instead to draw their masterpieces on screen on a virtual canvas using virtual colours.

Digital Painting is now growing popular among next-gen who creatively uses modern tools for making digital art or digital imagery in the computer. Computer software that help in creating virtual canvas and virtual colours and many tools that have replaced traditional painting mediums and woven canvas-cloth / paper now seem to be the first choice of digital artists. Here more accurate drawings of any form of geometrical designs, symmetry, repetition of motifs can be created very easily those are less possible in traditional painting. The option of undo without leaving trace adds more finishing and freshness to any digital graphics. Thus use of technology in creating graphics proves to be more accurate than that by human hands and traditional methods. It is now possible to generate more complex shapes and figures using computer programs by an artist for their visuals. Taking an example of ‘Fractal Art’ (*Fig. 01*) which was rarely drawn or painted by hand can now easily be created on computer, which is capable in creating any type of complex nature of patterns just by its calculations resulting to a mesmerizing fractal in form of still images or animated sequences.



Fig 01: Computer Generated Fractal Art (Created by Author)

Overview of Evolution of Computer Graphics

If you look back into the history of computer and technology you'll find a guy from mid twentieth century a scientist named Ben Laposky (1950) who invented first ever Graphic Images, he was a mathematician and artist in Cherokee, Iowa, he used electronic machine (which was an analog vector device) named Oscilloscope. By utilizing it as a medium for creating abstract images he produced most of the images. It was achieved by manipulating the electronic beams on the device and later on recording those on photographic films. He named these images as "Oscillons". Laposky created electronic vibrations on the screen of his Oscilloscope which produced a number of abstract images which were named as "**electronic compositions**" by the artist and by using photographic stills he captured those images, which he displayed too in an exhibition at Sanford Museum in Cherokee.

Later on, as technology advanced many inventions happened in this field. Invention of light pen (1955) as input device is one of them. By using this device (Light pen) earlier graphics designers were able to create basic shapes on computer screen by using **Ivan Sutherland's** software "**Sketchpad**" for sketching. Light pen has small photoelectric cell on its tip. When placed near a screen, with the help of cursor, one can easily draw any shape and fill desired colours to it. Sutherland's software has lots of self-programmed features like basic primitive shapes, which can help in easy drawing, hence one can choose from them and the shape is automatically created; only operator has to modify or reposition it in his composition.

In 1965 **Jack Bresenham** invented "Line drawing algorithm". By the early 70's Raster displays were introduced so the magnification of images became more clear and crisp. In 1977 **Apple II** design was presented to this world of computing which became the first ever Personal Graphic Computer. In the 80's various technologies were invented for creating and producing digital images on computer. Star Wars like programs used optimum graphic effects by using 'chroma key' (blue screening). We find the same revolutionary techniques of imagery introduced in printing technology too where the use of Computer Aided designs starts replacing conventional techniques. Many tools were developed to visualize data. In later stage this was bifurcated into 2D and 3D computer graphics. Over the past few decades we saw the growth in visualization, be it informative or scientific visualization.

Further advances in computing technology led to greater advancements in Post Script Page descriptions when "**John Warnock**" and pioneers founded **Adobe Systems** and made revolutionary entry into Photo editing and Movie editing software's "**Adobe® Photoshop®**" and "**Adobe® After Effects®**" respectively. By this time in early 1980s we see commercialization and modernization of computer graphics at steady rate. Computer was now

adopted by many sectors of society. Software Developers are increasing now significantly. Artists and animators have started using computers as a design tool on which they can design more accurately and saves lots of time. Macintosh computers are highly popular among artists and design studios.

During the 1990s' use of 3D modeling grows on mass. As the CGI quality improved, more users are now able to use their home or personal computers for 3D modeling and rendering. Earlier it was limited to heavy 'Silicon Graphic workstations' only. Growing demand of cost effective machines leads to popularity of Microsoft Windows and Apple Macintosh which are now capable of running 3D studio and Autodesk products. 3D graphics became far more popular among multimedia artists and animators.

Later in 2000s' video games and CGI cinema's accelerated pace leads digital revolution to new highs. Increase in digital processing and 3D rendering capabilities improved the efficiency of computer in texturing, shading, bump mapping allowing the simulation of details in imagery. Computer graphic imagery that was used in film and animation gradually increased the realism due to these advance GPUs. Animated 3D films like 'Ice Age', 'Finding Nemo' and 'Madagascar' are some examples where one can witness the close to reality and their photorealistic CGI characters that can be possible only with motion capture technique.

Use of Digital Technology in Graphics

As technology progressed we saw more advancement in 3D computer graphic use. It emerged as a new tool for generating virtual images, complex 3D models having vast number of polygon which were used in almost all major streams, like Architecture, Films, Medical science, Astrophysics, Advertising and promotional videos. Now graphics are nearly scientifically photorealistic, having texture mapping in matured stage we see that designers/modelers can create more complex objects, shapes and anatomy figures quite easily and that too with realistic ambience.

Here are some common terms that are used as technological tools in graphic context.

Desktop Publishing : Vast number of software are developed for integrating graphics and texts in layout so that it may be arranged in desired order for production of various images, magazine, catalogs, newspaper and other media in printed form. This form of technology allows users to create and print their data in magazine, book or paper formats. It is also used for Digital Typography where large number of fonts, symbols and icons can be used for composition. There are two types of pages that can be created on Desktop Publishing -

1. **Electronic pages:** These pages are published only in electronic form. e.g.,

Web newspaper, magazines etc.

2. **Virtual pages:** These pages are digitally designed page layouts to be printed on physical paper of varied size. e.g., News Paper, Books, catalogs etc.

Graphics Programs: Any software that is used for generating, modifying, or editing the digital images. Scribus, Krita, Inkscape, Microsoft Word, Adobe Indesign, Adobe Photoshop, CorelDraw, Blender, Maya etc. are some examples of Graphic programs.

Internet and Web: It is a worldwide network of computers interconnected with each other by internet protocol suite (TCP/IP) sharing extensive data of information resources and services among group of computers through graphical interface. Internet service providers made the connectivity available to the users who then share or obtain the information on network. This is a vital tool that was helpful for artist for gathering or sharing graphic data. Graphic artist can access various and enormous information from web uses it in their composition or can share his creative output to the outer world also.

You can find in later units of this course how effectively digital technology can be used as designing tool and helps artist in creating its artwork more easily and accurately.

Historical Background of Broadcast Graphics

In television technology 'Broadcast Graphics' were adapted as like they are used in films. Since the invention of Television in 1936, there were constant experiments were done for the enhancement of its potential visual communication by creating attractive graphics. During this period all graphics were created by hand on celluloid, paper and card board. Some studios use embossing machines to give the feel of 3D. Usually Program Title, Maps, Illustrative charts, Credits and weather report featuring temperature were common graphics prepared by artists. Whole process was extremely time consuming and due to limited resources and technical limitations in resolution of only 405 lines restrict the professional painters in achieving desired results. Most of the areas around borders and corners of screen was not fully utilized as it remains out of focus as the resolution of cameras was very low.

Letters and text that was written on black paper sheets are bold and larger in size. For credit rolls lettering was done on paper roll and then manually or with the help of electric motor it was physically rolled. All illustrative work would also be created with bold outlines. Sometime limited animation gimmick were done by designers. They make cut holes a window like shape on black paper sheet then write lengthier text matter on little bigger size of black paper strip which was placed behind that cut window opening. (*Fig 02*) Then a path was made

by sticking little thick paper so when this text written strip was dragged or pulled from one side only some part of text appears on screen and gives crawl like effect.

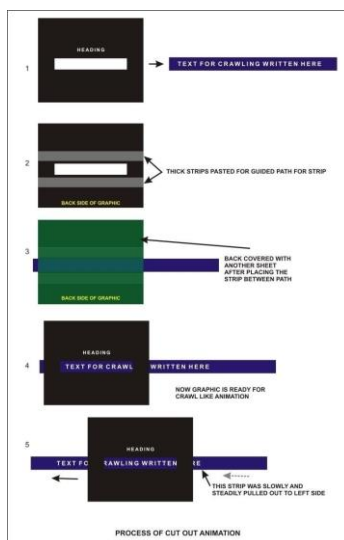


Fig02: Manual Process of scrolling by making cutout mask on paper

It was the time during 1920's when Graphic designer, **Saul Bass** made Graphics for Films and Television. He was the earlier artist before computer generated graphics invaded the industry. He had designed many opening titles for number of films. *The Man with the Golden Arm* (1955), *Vertigo* (1958), and *Psycho* (1960) etc. are few famous films for which he made title sequences. He was a creative and talented designer, and a pioneer of motion graphics. Comparing from today's standards, Bass' designs seem very simple and amateur, but they were effective and considered state-of-the-art visuals at the time when all graphics were created by hand, without the aid of any computer.

Later **Rostrum camera** was invented and frequently used in Graphic designing. By the help of this vertically mounted Rostrum camera Graphics and cell animation sequences become automated to some extent. This camera has the function to move up and down and any artwork which was placed in front of it was exposed on film and later on after processing like any other film these exposed negatives were edited manually and pasted so as to give the motion effect to that artwork. With the help of Rostrum camera 'Still images' like Photographs, Paintings or hand drawn artwork was exposed on film. This also helps in shooting lots of cell frames for 2D animations. Later on as the technology advances further these Rostrum cameras were attached with motorized units which helps in taking more variety of camera moves such as '**Slit-scan**' and '**Streak-timing**'.

The 1980's more development happened in Graphic technology, resulted to the evolution digital paint systems like '**Quantel Paintbox**'. This gadget strengthens the creativity of Graphic designers and enabling them to assemble collages and montages as well as to adapt more images into their compositions. Graphic Designers are now able to type on Quantel Paintbox by choosing varied Fonts, though limited, but this text typing saves a lot of time and also the finishing in artwork was improved. Earlier these compositional Lettering or typography were drawn either by hand or by using stencils, later on **Letterset transfer sheets** and **character generators** came to help designers in formatting, composing text matter with wide range of fonts, borders and corners readymade designs. By the help of Quantel machines text captions could now be composed in few seconds. The computer systems are become so functional, that it was used in varied form of designing with numerous ranges of fonts and symbols.

After computers were introduced to graphic industries, companies in association with BBC develop Character Generator, an initial device for creating onscreen graphics named '**Aston**' and '**Chyron**'. These hefty and bulky machines are very popular in that era as the graphic generated on these machines are quite crispy and fast as compared to the traditional manual graphic making process. It consumes less time, paper & pigment colours were replaced by electronic generated imagery.

In 1990s 3D Character Generators were introduced to electronic media, they are improved versions of their ancestor CG machines, Quantel Paintbox was one of them which were very costly and bulky also. It was generally used for generating backgrounds and small animated sequences. It takes frame by frame rendering process which was very tedious and time consuming. Later Silicon Graphic computers invaded the industry, though they also had memory like issues but become the first choice of designers and 3D animators as they can operate various dedicated programs on it. This era of Silicon Graphic® and Qantel Paintbox® was not as lengthy because Windows based Computer machines stepped into the market and programs like Adobe® Photoshop®, Adobe® After Effects®, Adobe® Premier®, Digital Fusion®, were equipped with lots of Tools and Effects. Windows- driven software is easy to operate and was programmed by keeping in mind the artistic sense of Visual art.

Principles of Design

Before starting any artwork or painting or any digital layout it is good to follow some rules and principles that will enhance the composition's aesthetic value and appears more effective, balanced and meaningful. Some aesthetic principles are drawn which guides for a

good and balanced composition. These principles are – Unity, Harmony, Contrast, Repetition, Variety, Emphasis, Balance and Proportion (*Fig 03*). According to the author of ‘*The Elements of Graphic Design*’, Alex White: “*To achieve visual unity is the key concept and main aim of any graphic design. If all elements are in linear arrangement, a graphics design is treated as unified*”.

The expert designers sometime break these rules of designing. They usually compensate this by some unusual composition for viewer’s attraction or achieving something different. But it is always recommended that unless you are not sure or be certain of doing something miraculous, it is better to abide by these principles.

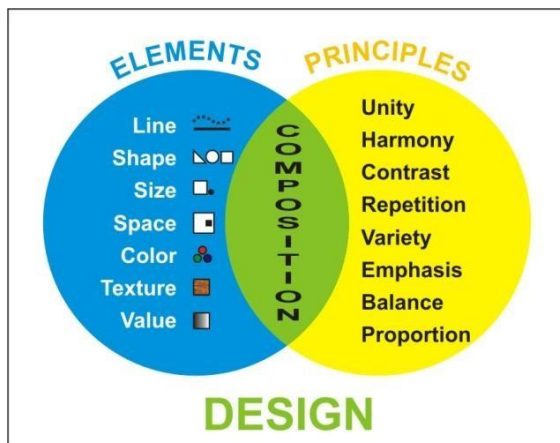


Fig. 03: Design

Created by Author

- **Unity:** It refers to a sense that all elements in your composition or in a piece of work will be in proper order i.e. having some sort of relation in between them. If proper unity is achieved it will bind all forms into a single piece of work that is an ‘artwork’ in proper sense. Unity can be achieved by proper use of balance in composition, repetition of graphic forms.



Fig. 04: Unity, Created by Author

- **Harmony:** Always remember that Harmony is a very important element in composition and it is created by the balance of unity and variety. It can also be achieved by Colours, using complementary colours. It appears visually pleasing and makes any composition more lively and balanced.



Fig. 05: Harmony, [Created by Author]

- **Contrast:** Separating and making the subject prominent is the main use of contrast. It can be achieved by choosing variation of great difference in colour, value, size, etc. It creates significance in layout and attracts the viewer's attention close to the important area in the subject.

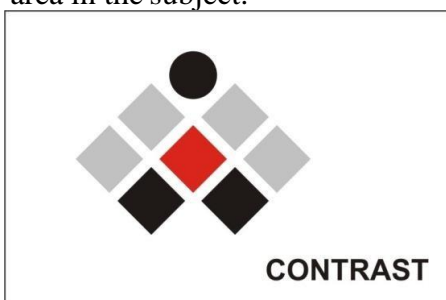


Fig. 06: Contract [Created by Author]

- **Repetition:** Repeating some elements within a composition, be it in the forms of
- colours, lines, shapes, values, etc. with some variations to generate interest in design.

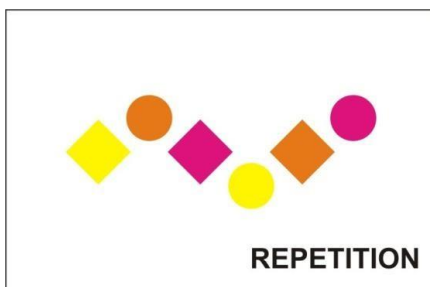


Fig. 07: Repetition [Created by Author]

- **Variety:** The use of various elements in composition, which creates interest in the mind of viewer with variation of forms and colours in order to make design more dynamic and not have monotony, is called variety, another important principle in design.

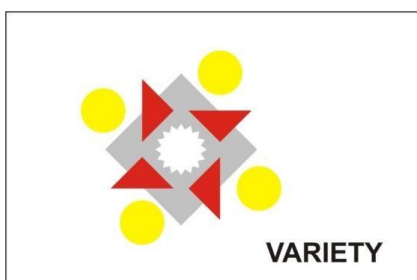


Fig. 08: variety [Created by Author]

- **Emphasis:** It specifies the prominent area of interest where the designer wants to pull more attention of the spectator. It is the main point of interest in any composition. It also gives direction and specific pattern to a design. Emphasis or ascendancy of an object can also be achieved by increasing the object size, by placing it in the prominent area or foreground, and making it visually emerge more compared to other objects in a painting or artwork.



Fig. 09, Emphasis [Created by Author]

- **Balance:** There are two types of Balance, symmetrical or asymmetrical. It depends on artist's visual sense how to use it. Sometimes this balance can be gained by arranging its objects according to their figure or sizes and sometimes it can be according to its colour also. Symmetrical colour scheme can also help in making the composition more Balanced.

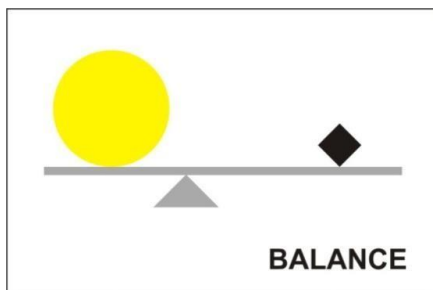


Fig. 10:Balance [Created by Author]

- **Proportion:** It involves directly with the relationship of size of different objects. Sometime Proportion is also relative to size of areas of different colours. Proportion also depends on purpose of used object in composition.

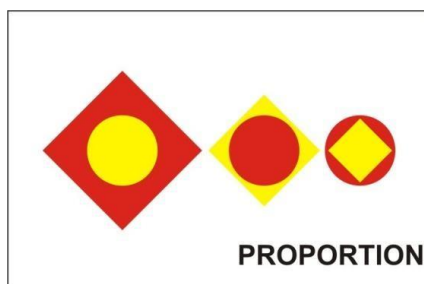


Fig. 11: proportion [Created by Author]

Design Elements

E. Graves (1902-1978) in his book *'The Art of Colour Design'* mentions that any composition can be created by using these elements of design. (Fig 03). These design elements are Line, Shape, Size, Space, Colour, Texture and Value. Hence these are the components which are used in creating any painting or digital layout.

- **Line:** Line is treated in two ways. The linear marks made by any writing/painting tool or the boundary created when two shapes meet. While making any composition be careful in adding Line shape horizontally, It should be more than 4 points thick otherwise it flickers like crazy on screen due to interlacing.
- **Shape:** A shape is a geometric form, drawn to create objects, figures and visual components in any layout. A shape may be round, square, triangular or oval etc. Try using similar shape throughout your Compositions.
- **Size:** It is an important element as it makes your artwork attractive and organized. Choosing the right size for selective layout is very important. If you are creating Graphics for Television your layout must be in horizontal shape and usually be either a 4:3 or 16:9 displays. Hence it is better to know what your target output size is. In television broadcast system there are various display sizes. Some of them are listed as below:
 - **Display Size –4:3 format**
 - a) VGA:640 x 480
 - b) PAL: 768 x 576
 - c) SVGA:800 x 600
 - d) XGA: 1024 x 768
 - e) 1280: 960
 - f) SXGA+:1400 x 1050
 - g) UXGA :1600 x 1200
 - **Display Size –16 : 9 format**
 - a) WVGA : 854 x 480
 - b) HD 720 : 1280 x 720
 - c) 1366 x 768
 - d) HD 1080 : 1920 x 1080

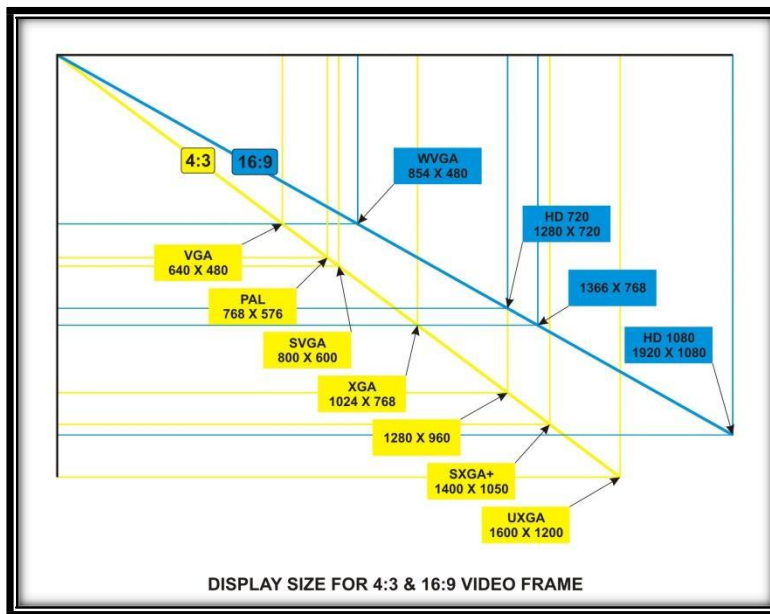


Fig. 12 – Display size for 4:3 & 16: Video frame [Created by Author]

Some other Display Sizes are as below :

- a) Cineon Half : 1828 x 1332
 - b) Cineon full : 3656 x 2664
 - c) Film 2K : 2048 x 1556
 - d) Film 4K : 4096 x 3112
- **Space:** It is the area that contains any visual image or shape in the given picture. It is referred in design element as an aesthetic element also as it gives some meaning and aesthetic value to any composition. There are two types of space in any composition ‘Positive’ and ‘Negative’ space. Positive space is referred as the ‘Brimming’ space or you may say it is any form, object or element that is occupying space in any design layout. While Negative space is the empty space leftover in design.
 - **Colour:** In technical terms colour is referred to as ‘Hue’. It is the most important element of composition hence its use is very crucial. In any composition choosing right colour is very important as artist should know the properties and their combinations of colour schemes for effective and meaningful output or composition. Colour schemes or colour harmonies are made to help artists choose the colour that suit their composition or layout. For the help of designers and artists in choosing proper colour; having certain properties and meaning, colour wheel was invented. This colour wheel is a visual representation of all Basic colours specifically known as Primary, Secondary and Tertiary colours.
 - **Texture:** Texture is like material coated on the surface. It reflects the quality of a shape –means viewer can assume the surface after looking the drawing, that gives the feel of smooth, soft, hard, rough, glossy etc. Texture can be created by two methods, Physical

(tactile) or Visual. *Physical Texture* is that texture which you can actually feel by your hand. *Visual Texture* is only an illusion. It just gives the feel of physical texture to the viewer. Use of Digital Paint in artwork gives the effect of texture to it.

- **Value or Tone:** Value is referred here as the lightness or darkness of a colour. It is also termed as Tone sometime. Difference between the light and dark areas in a graphic composition is known as Tonal contrast.

Fundamentals of Computer Graphics

In the field of Information & Technology Computer Graphics is an emerging trend. Almost any venture now days make some use of Computer Graphics. Some major areas are - creating Cartoon Films, Animations, Architecture, Fashion Designing, Photography, Special effects for films and Ads, and for visualising Print publicity for which we use Computer as a tool.

In addition computer graphics are massively used in the Film and Video industry, exclusively to develop special effects in movies and animations. Video games are now very much popular among all generation groups. In the field of Animation there are graphic artists, who efficiently blend different techniques by using or exploring different media effects to enhance the creative aspect.

Now the question arise how we perceive any information in a computer? Answer to it is obviously by seeing Images, Texts and Through Videos, while sound support us in understanding the visuals. These visual are created by the computer using various input devices. These are:

- **Keyboard and Mouse**



Fig. 13- Keyboard and Mouse [Created by Author]

- **Wacom Tablet**



Fig. 14-Wacom Tablet[Created by Author]

- **Scanners**

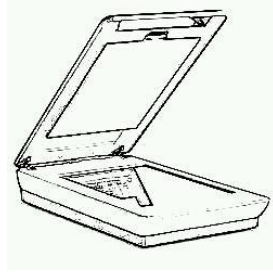


Fig. 15-Scanners [Created by Author]

- **Digital Camera**



Fig. 16-Digital Camera [Created by Author]

We have output devices on computer through which we can obtain the information are:

- **Monitor**

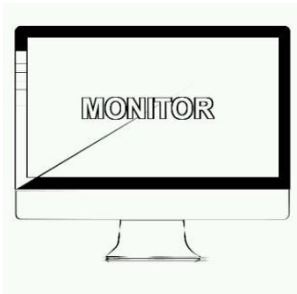


Fig. 17: Monitor [Created by Author]

- **Screen**



Fig. 18-Screen [Created by Author]

- **Printers**



Fig. 19-Printers [Created by Author]

- **Speakers**

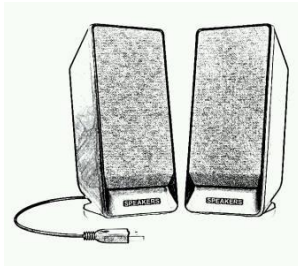


Fig. 20- Speakers [Created by Author]

In computer we have CD/DVD ROMs, Hard drives and Tapes as storage devices. These all devices are connected with various cables, wires and fibre optics through which the information was carried to different devices and transmitted to different places for e.g. transmission using computer networks and through different broadcasting mediums.

Multimedia production for presentation, films requires Graphics, some moving images, such as animation and sound. It also requires effective approach of utilising the data consisting of text, voice, audio components, video components and image animation. Here in integrated multimedia applications user can modify this data by cutting partial sections of all or any of these components and pasting them in their project for making their presentation.

While working on computer graphics we use some media elements for creating our projects, these are as follows

- **Images** : These can be imported from digital cameras or scanned through scanners using a hand scanner, sheet fed scanner, flatbed & drum scanner. After scanning these photographs or other various images save them in any desired format (JPEG, TIFF, GIF etc.). You can use any other program to generate your own graphics/image like Paint®, Inkscape®, Krita® etc. If one has good hand in drawing and painting then they can create sketches, painting on paper and then after scanning that artwork you can use them as digital images.
- **Text**: Using variety of fonts and symbols.
- **Video**: This can be recorded by camcorder or digital camera, now even smart phones

comes with high quality recording facilities in it and animated sequence.

- **Audio:** Adding music to compositions is very important; it can be created or recorded from any source.

Note, however, if you won't be able to create drawings/sketches through pen and paper or in any computer program, need not to worry, you can pick up existing images for a wide range of purposes. Collections of clip art are available on web and in many commercial and shareware software packages.

Term Clip art is used for image files (sometimes for other media files like animations or sound tracks) that you get readymade and not created by you but which are made available to you for use in your graphic compositions. Clip art libraries can be found on Web, it comes along with some software packages, and on CD-ROM/DVD disk from different vendors like "Getty Images" or any local software store. These Clip art as a rule are offered copyright-free, and you can use them any way you like. Some Clip art collections are copyright protected for some uses; be sure to read any copyright notice accompanying any clip art before using them into your artwork.

Downloading Clipart from web

1. Using Internet browser, go to web page of Clip art/Image site.

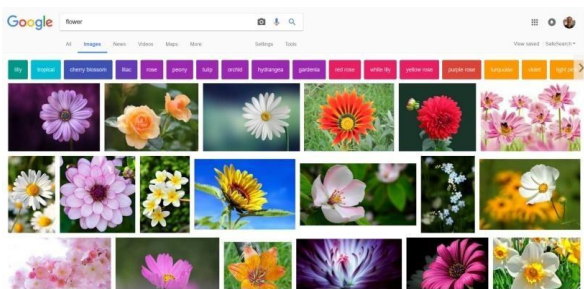


Fig. 21 Screenshot

2. Browse your desired picture and select it.



Fig. 22 Screenshot

3. Right click you mouse button and choose Save Picture As from the pop-up menu.

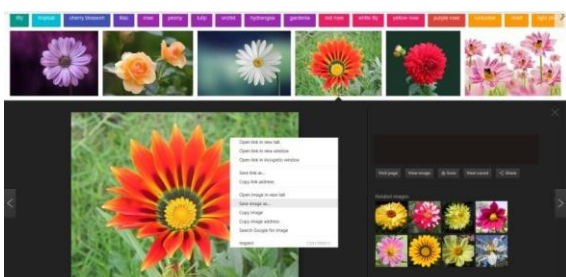


Fig. 23 Screenshot

- Save this file on your computer using the path and filename desired. All image files has name by default, but you can rename those to for your identification. Do not change he extension, which informs browsers of the image's type.

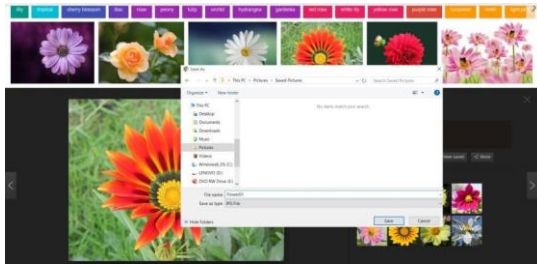


Fig. 24 Screenshot

- Now switch to your Program and import/insert this image.

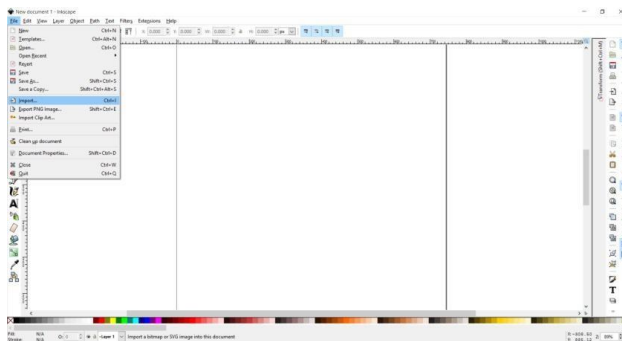


Fig. 25 Screenshot

- Select the image from the location it was saved on computer and click the open button.

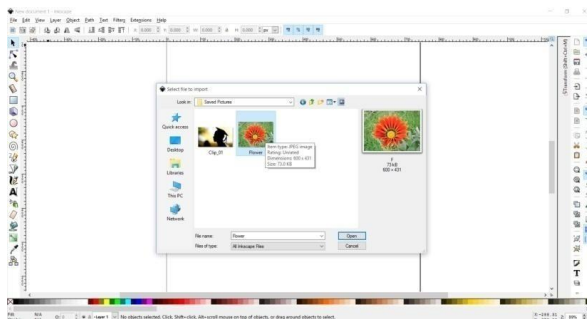


Fig. 26 Screenshot

- Now this image is placed or imported to working software/program.

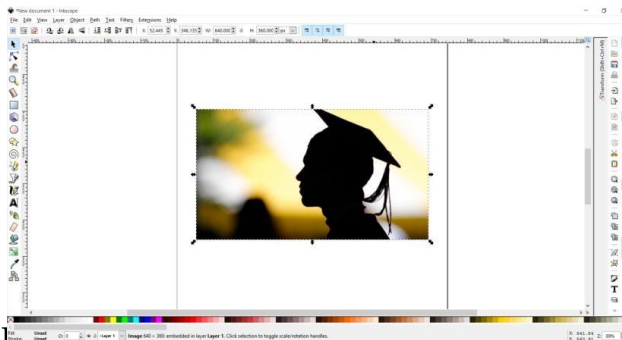


Fig. 27 Screenshot

Using Images from CD-ROM/DVD

1. You can insert/import a picture directly from your disk (CD/DVD) into your program or
2. You can copy Clip art/ Images from CD-ROM or DVD to your project folder on your Local drive by creating a new folder and renaming it 'Clip art' or whatever you like.
3. Use 'My computer' to navigate to the CD/DVD drive where it is stored, locate the exact image (can preview by increasing the Icon size) you need.

Important Stuff about using Images

Before inserting any image into your composition check the quality and resolution of chosen image. Resolution of image may differ from medium to medium, for Print medium, image should be not less than '300 Pixels per inch' but in video it will be of '72 Pixel per inch'. Images used for printing purpose require more colour depth in image and higher resolution. Higher resolution means bigger file size.

Print Graphics and TV Graphics

Computer screen has relatively low-resolution as compared to printed surface. Computer screen has 72 dots per inch resolution display while most four colour printing of magazines is done on 300 dpi at least. It means the resolution of printing is higher hence more fine details were produced on paper as compared to television screen.

Four colour print reproduction is separated into four colours also known as '**Subtractive Colours**' These colours also known as CMYK colour scheme where 'C' is 'CYAN', 'M' is 'MAGENTA', 'Y' is 'YELLOW' and 'K' is referred to 'BLACK'. (Fig 28)After mixing these combinations with different tonal values we get the image printed on paper. These four colours give the illusion of full range of colour on any printed surface but only 4 primary colours are printed through separate plates of each colour.

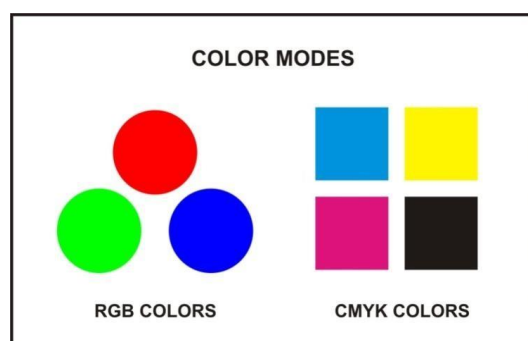


Fig. 28-Color Modes [Created by Author]

Trans illuminated Images on Television or Computer monitors are generated by three colours RED, BLUE and GREEN commonly known as RGB colour where each initial represent each colour. This scheme is also known as ‘Additive Colours’ also. These illuminated images have greater range of contrast and colour intensity as compared to subtractive colours printed on paper. One reason may be that what is printed on surface was received by human eye as a reflected light, but RGB colours system appears to be much broader and subtler range of colour.

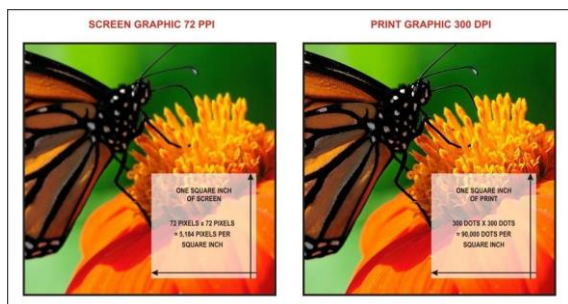


Fig. 29 Additive color [Created by Author]

Unit summary

In this unit you learned the **Basic of Graphic Design and Use of Digital technology**; ‘Historical Background’ of Graphics since the beginning of Television and stages of development of Television. You were able to understand about the ‘Elements of Designs’ and ‘Principles of Design’. How to add aesthetics to any composition? Why these elements are important for any layout.

We also addressed about ‘Fundamental of Computer Graphics’ and able to distinguish Additive and subtractive colours. How their properties are different from each other? While working on TV graphics or Print Graphics you may be able to select the appropriate colour mode. You also learn the difference of pixel size between Screen Graphic and Print Graphic along with CMYK and RGB colour.

We also discussed importing and cropping the clipart, images from internet or CD-ROM/DVD.

Assignments

1. Name the person who invented Computer Graphics?
2. List the elements of design? Briefly explain their use in multimedia designing.
3. Describe the term ‘Fractal Art’
4. Describe the use of Computer Graphics.
5. Explain the need to use Principles of Design.
6. What is Chroma key and how it is beneficial in making videos.
7. Describe the use of Desktop Publishing.

8. Write the role of Scanners and Cameras.
9. Differentiate between additive and subtractive colour mode.
10. Identify the primary colours for Print medium and Colour Monitor? How do they differ in properties?
11. Write the difference between 4:3 and 16:9 display size of video frame?

Resources

1. *Lidwell, William; Kritina Holden; Jill Butler (2010) Universal Principles of Design* (2nd edition). Beverly, Massachusetts: Rockport Publishers. ISBN 978-1-59253-587-3.
2. *Charlotte Jirousek. Art, Design, and Visual Thinking*. An online, interactive textbook. Cornell. edu, 1995.
3. *Graves, Maitland. The art of colour and design*. (2nd edition). New York, N.Y.: McGraw-Hill, 1951.
4. *Alex White. The Elements of Graphic Design*. New York, NY: Allworth Press. pp. 81–105. ISBN 978-1-58115-762-8.

Unit 2 Understanding Digital Images

Introduction

Pixel and resolution are the primary source of the video which displays any image on the screen or monitor. Clarity of any image depends upon its resolution which is calculated by the amount of pixels having in it under standard and universal measurement unit i.e. “Per Square Inch.” It means that the more the pixel per inch present in an image, more colour information and details is present in it. Increasing the quality of image is possible by increasing the PPI.

Secondly, every digital image must be saved in desired format or which will suit to your requirement. As now there are lot of common formats like “JPEG”, “TIFF”, “PNG”, “GIF”, and “TARGA”, “BMP” etc.

Outcomes

Upon completion of this unit you will be able to:

- Describe Pixel, Resolution and Bitmaps;
- Differentiate Square and non-square pixel and Pixel dimension;
- Recognize different file formats;
- Practice optimizing Digital Images;
- Modify colour by reduction algorithm;

Terminology

Alpha Channel:	It represents the degree of transparency present in any colour.
Algorithm:	A procedure to solve any complex problem.
Bitmap:	It is a type of memory organization that stores the image format
Mega Pixel:	Unit used for One Million Pixel.
Optimization:	Process of reducing the Image file size without any change in quality, sharpness or tonal value for faster download from web.
Pixel:	Single rectangular shape dot that contains blend of RGB colour information.
Resolution:	Amount of Pixels presents in Display monitor on ‘x’ and ‘y’ co-ordinates.

A Brief History of Designing

Since the inception of civilisation humans were fond of making images. During those

ages humans communicated through signals, symbols and sounds. Sometimes they used to create images of their daily life on cave wall where they dwelled. They were very much intrigued by the majestic nature and hence they used to draw to express their thoughts and reverence towards the unknown power. That was the only way of communication in prehistoric era as the knowledge of languages had not come to humans till then. Mostly hunting, animals, motifs, and images related to nature were common subjects whom they engraved by rough tools generally stones, charcoal and chalk. Initially colours were not used, only outline of figures were engraved without any details. These images were drawn either for their memories or to show the strengths of their habitation.

As the times passed, prehistoric humans started inventing more means of communication. By the ancient time around 1000–500 BC humans had developed the alphabets; their drawings were now little more advance and had greater details like paintings of later period. Use of pigment colours was introduced to wall paintings. Later after the invention of paper and inks these groups started making paintings on paper. Engraving techniques like Lithography and Etching were developed. Artists were now well equipped with different tools, brushes and colours which they used in creating their artworks.

During 400 & 1000 AD books were the storage medium of information. Decorated illustrations were given place as visual communication; the contents of books were hand written initially. Much later, after invention of printing press Typographic fonts, blocks and screens were used for printing on paper surface. This period is known as Renaissance era of human civilisation; the period approximately from 1300 to 1800 AD. A lot of inventions were made during this period in all fields. Various Printing techniques were developed; Books, newspapers and magazines now became the main storage medium of information.

In the modern world when film and magnetic tapes were invented, they brought a revolution in the field of information and communication. Now it was very easy to document anything by photograph with a new invention, ‘**camera**’, now everybody’s most popular machine. The photographs taken from a camera produce images that are more realistic, more authentic and accurate than those produced by paintings or illustrations or any other traditional method of creating images. Films and magnetic tapes are the storage devices that store all these artworks and information. After it came the electronic era (1950 – 1980) what we call Telecommunications. Television and Computers were invented as tools of information and now all information is stored on these electronic tools like Electronic memory cassette, L.P. records etc.

After the invention of digital techniques there were drastic changes in information and communication mediums. It also helps other varied sectors in their functioning, for example in

Medical science, Astrology, Space missions, Banking and Insurance sector. These are just a few examples that have been benefited and are now using newer techniques in their functioning.

CD-ROMS, DVD, Blu-ray Hard disks became the storing devices for any information. Digital cameras and computers had given a new meaning to the digital art. Higher details in photography are now possible through advance cameras. They have processor to generate stunning results. Digital images produced by these cameras are very much clear, sharp, and instant. Variety of mesmerising effects of virtual world can be generated by these tools. Film and television industry, Printing and Gaming industry are main gainers of this digital revolution. Pictures are now displayed through “**Pixel**”.

Pixel and Bitmaps

A **Pixel** is a tiny dot which contains RGB information of any picture. Computer monitor reflects colours through this information. Millions of pixels are connected in lines and columns and attached together to form an image on display monitor. Each pixel has RGB (Red, Green and Blue) information which was calculated in bits. It is binary and only has two possible values, 0 or 1. Colours or shades of gray present in any displayed image are determined by bits which are used to represent each pixel. If we take an example of 8-bit colour mode, it means that our colour monitor is using 8 bits for each pixel, hence the monitor is capable of displaying $2^8 = (256)$ of different shades of gray.

Here you may note that aspect of any display monitor depends on its resolution. VGA system displays 640 x 480 resolutions; it means about 3, 00,000 pixels. While SVGA monitors can display 800 x 600, or 4, 80, 000 pixels. 24 bits per pixel were used by True colour system monitors that are capable of displaying 16 million different colours. One more important point you may note that Pixels of any image don't have a definite / fixed size. They are relative to the screen's resolution.

Every pixel stores its own value or colour information, or intensity. If all the pixels in any image have the same value or colour information, then it is a uniform colour image. Intensity in a Black and white image is from 100% white to 100% black. While on the other hand, intensity of each **Red**, **Green** and **Blue** value in all colour images are from their brightest to darkest value.

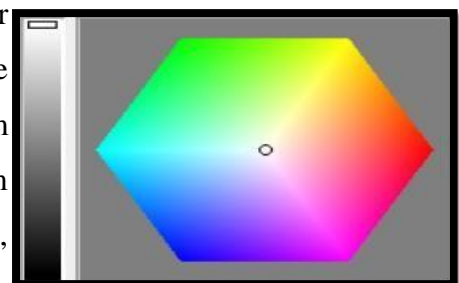


Fig 01-Pixel [Created by Author]

By mixing these primary or basic colours, in varying proportions, another colour is

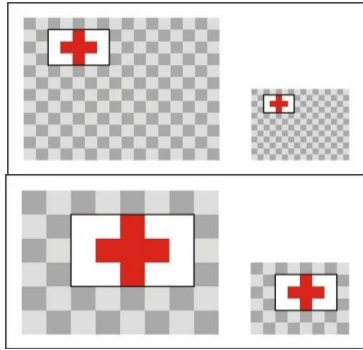
produced that is called 'secondary colour'. Image generated in such way will contain varied range of tonal values. Since one more thing is added, all RGB images consist of 3 x 8-bit intensities; that's why, they are also called as 24-bit colour images. It is important to mention here that in theory, an 8-bit range stores values from "0" to "1" using $1/256^{\text{th}}$ increments, while in real term, 8-bit images appear only in whole number; that is from 0 to 255

All digital images consists Pixels that stores 24-bit colour information. These digital images are also called as Raster images. **Bitmap** is a file that indicates a colour of each pixel along its horizontal and vertical axis i.e. "x co-ordinates" and "y co-ordinates" respectively. A 'JPEG', 'BMP' or 'TIFF' for example contains a bitmap of an image. In some images transparency value is also stored. Those images having transparency channel also are of 32-bit. Image files like - Targa, PNG and GIF are capable of storing this transparency value.

Resolution and Pixel Dimension

Any image appears on screen can be displayed high and low quality due to screen resolution. This screen image is expressed as "**dpi**" (Dots per inch), here Dot is represented as pixel or "**ppi**"(pixel per inch). This resolution is determined by both physical screen display size or by resolution settings. **Pixel Dimension** is the horizontal and vertical measurements of a digital image. Dimensions of any image can be calculated by multiplying the width and the height by the dpi. All digital cameras work on this pixel based technique; dimensions of their output images are calculated as the number of pixels in horizontal and vertical co-ordinates which also specify its resolution.

Image size exactly specifies the number of "**Pixels**" within a digital image, while "**Resolution**" is the pixels occupying the image or can say groups of pixel carrying colour information. For resolution we use following terms "**ppi**" as **pixels per inch** and "**dpi**" is **dots per inch**. "**ppi**" refers to 'pixel arrays', while "**dpi**" refers to 'Printer resolution'. There is one more resolution term that you may encounter is "**Lpi**", which is known as '**lines per inch**'. It is generally used in printing technology. By default resolution of images captured by camera or video is 72 ppi. Depending on each monitor specification, its screen can display maximum amount of pixels, but their resolution can be increased or decreased by adjusting the settings of any display monitor screen. By reducing the number of pixels of display monitor we can increase the size of image and therefore increase or expand the image size. See below two examples of screens.



(Fig 02) (Fig 03) [Created by Author]

This can be understood by above illustration more easily. There are two images one has 16 x 12 pixels (Fig 2) and 8 x 6 (Fig 3). Let's assume each square as 1 pixel and the whole area as screen. Observe that when resolution was lowered to half (Fig 3) the image appears double in size, but if image was scale down as shown in smaller images of both figure we observe that their resolution is twice and have more pixel per square inch of monitor.

Hence, we can say that the higher is the pixel resolution, the higher is the quality of the image. Higher pixel may also increase the file size of image also.

Aspect ratio

It is an important concept with the pixel resolution of output device of computer. Every monitor or screen is quite different from one another. We can easily understand size of any screen without physically seeing it or can assume it. Aspect ratio is helpful in making digital images where the exact size is not known, only ratio is known. Just by ratio one can easily able to design his composition which can be scaled up or down later to fit in desired size. Aspect ratio is the ratio between "X" and "Y" co-ordinates of an image. It can be differ in separate image sizes and in separate screens.

The common aspect ratios of video screen resolutions are - 3 : 4 and 16 : 9 in video format. There are some other few ratios also like 5 : 3, 16 : 10 (WXGA), 5 : 4 (SXGA).

While creating any graphics these ratios must be kept in mind and follows as a thumbs rule otherwise crated image may get distorted or become non-impressive.

Square and Non-square Pixel

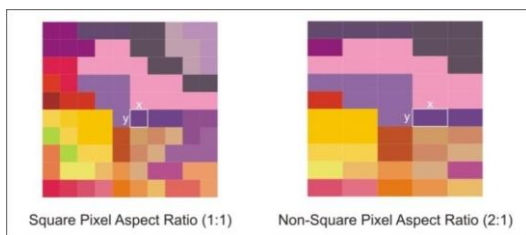


Fig 04-types of pixel [Created by Author]

It is very important to learn the properties of “**Square**” and “**Non-Square**” pixel as both have certain differences. If we design any composition of graphic in Square Pixel (as most of graphic software generate image in this format) on computer display or computer based software like Adobe®Photoshop®, Flash etc. it will be fine but if we display the same image on conventional Standard-definition Television (PAL or NTSC) that uses rectangular pixels our image will get horizontally distorted and unnaturally stretched.

Digital camera images, web videos is always ‘Square Pixel’ based but videos shot on PAL D1/DV or NTSC D1 video, a digital electrical video signal (SDI)are rectangular or non-square pixels. So if you are using this format into your project do changes to get even output. Similarly, consider it also before making any graphics on these formats. A Circular shape will appear horizontally stretched while in PAL video it is squeezed. Following illustration will make it clearer. Here are three monitors, ‘A’ is ‘Square Pixel’ based computer screen on which circular object is perfect round.

But if it is not corrected it will appear distorted in ‘B’ (PAL) and ‘C’ (NTSC) non-square monitors.

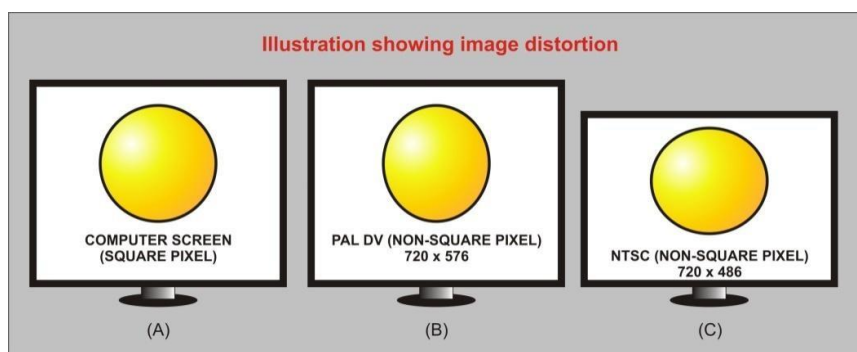


Fig 05- image distortion [Created by Author]

While doing editing on Standard Definition software Pixel Aspect Ratio must be taken into consideration. Graphics or video footages generated on Square Pixel ratios must be used very with cautiously. Adobe®Photoshop® software had reduced this size related puzzle with its default file sizes for various frame size. Hence need not to worry distortion of image the only care one has to take is just choose the right size for output. Adobe After effect software will also be helpful in handling or making correction to this type of complexity. See below when creating new file in Adobe® Photoshop® following options are suggested by software when we choose our preset size as ‘Film & Video’.

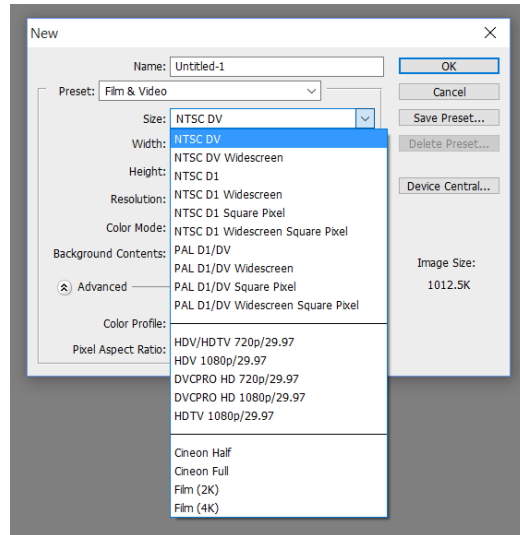


Fig 06: Size templates for different video formats in Adobe® Photoshop®[screenshot]

When your project is ready for outputting, Adobe Media Encoder is software that can take care of your size with properly scaling it for any format.

Pixel Dimensions

As we know that an “inch” is a standard unit of measurement, which cannot be change and remains same and equal. But Pixels may vary in different photographs; say one picture of 10 inches x 8 inches may be of 300 PPI and can be of 72 PPI. Size doesn’t matter but the resolution of image that is holding more pixels in one inch appears to be more sharp and clear. Here size of a pixel in one inch is much smaller as compared to the 72 PPI’s pixel size, for example, you can accommodate more tennis balls as compared to footballs in the same area.

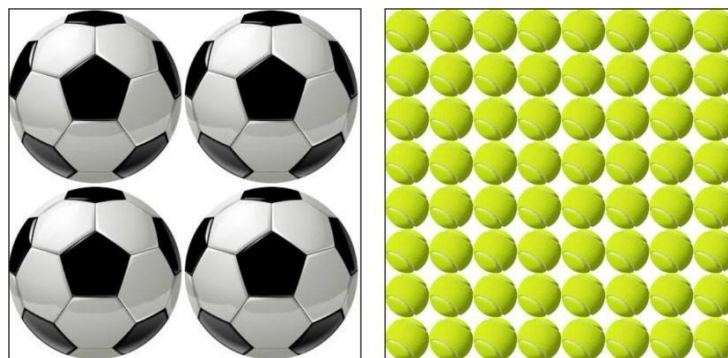


Fig 07-Pixel dimensions [Created by Author]

You need not to worry about it as Image editing software including “Adobe®Photoshop®” do resizing of pixels for us. Here I just want to brief “image resolution” has two things – size of a pixel and number of pixel per inch (PPI) that will be printed on surface. Hence you have to be very conscious of using correct “PPI”.

Here’s one photograph which is clicked by 10 MP camera, having resolution of 3648 x 2736 to illustrate how re-sizing of images works.



Fig 08-Photograph [Taken by author]

This picture obviously appears smaller as to fit in the screen window of “Adobe® Photoshop® Software” to see the actual size of image you have to open “Image menu” and scroll to “Image size”.

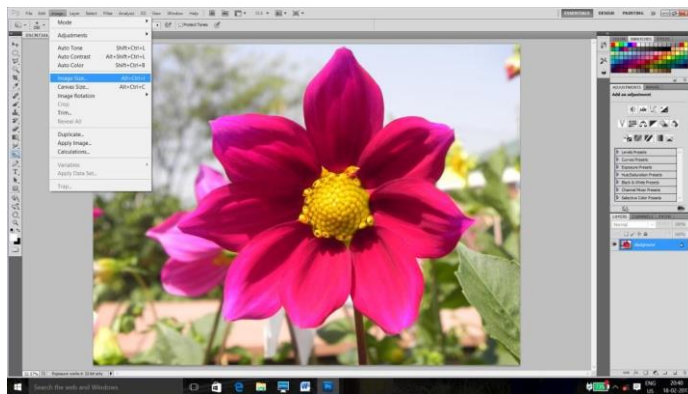


Fig 09 screenshot

After clicking on “image size” a dialogue box will appear on the screen, which provides the information about the size, resolution and pixel dimensions of this picture. On top you can see “**Pixel Dimension: 28.6M**” which is the file size of this Image on disc. Here you saw two types of Sizes, “Pixel Dimensions” and “Document Size”. Adobe®Photoshop® is giving measurement of this image in “Pixels” as well as in Centimeter or Inches, as per Width and Height of above image which is 3648 and 2736 respectively. It means that 3648 pixels are in “x” co-ordinate and 2736 in “y” co-ordinate. If we multiply ‘x’ co-ordinate times ‘y’ co-ordinates we get total number of pixels in image. If we calculate for this picture, 3648×2736 we get total 9,980,928 pixels.

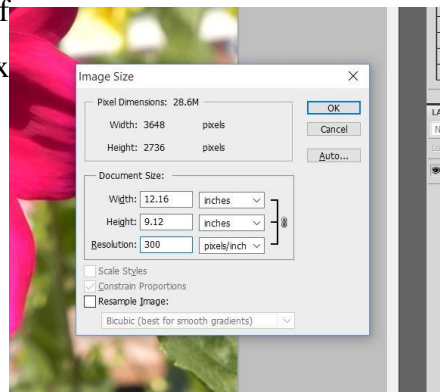


Fig 10-screenshot

If you remember, it is mentioned above that this picture was taken by 10 Mega Pixel

Camera. Here Mega stands for “Million” hence “10 MP” means 10 Million Pixels. Our total pixels (9,980,928) come near to it. Similarly if 16MP or 24MP camera, we get 16 Million or 24 Million pixel images from it.

Document Size

Now, let’s discuss the “Document size” which is 12.16inches in width and 9.12 inches in height with 300 Resolution. It means above image having 3648 pixel x 2736 pixel on 300 resolution when get printed on paper will cover area of

“x 9.12”.Let’s do some maths here if we divide pixel width by resolution, we gets the printable width.

$$3648 \div 300 = 12.16 \text{ (width)}$$

$$2736 \div 300 = 9.12 \text{ (height)}$$

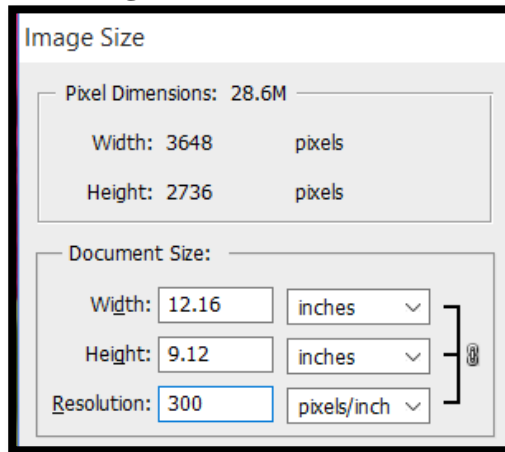


Fig 11-screenshot

Now, if we reduce the resolution from 300 to say 72 pixels/inch, our width and height’s size increased to 50.667” and 38” respectively. It means this document is oversize for A4 size print.

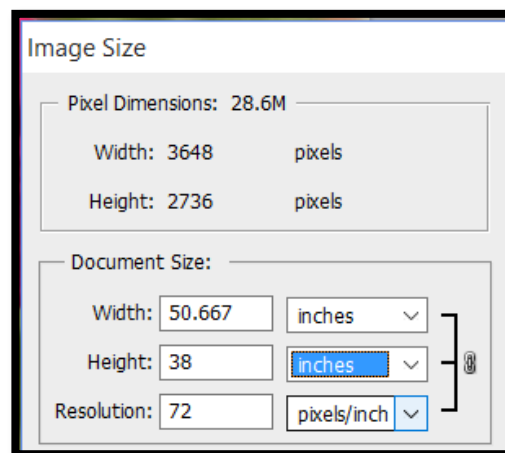


Fig 12-screenshot

One important thing you may notice here that even after reducing the resolution 300 pixel/inch to 72 pixels/inch width and height of pixels remains same and even it size also i.e.

You can also use **GIMP (GNU Image Manipulation Program)** as it is open source (free) editing software very much similar to Adobe® Photoshop® for changing the size and resolution of image. **Krita®** is also a similar image editing program where you can manipulate the digital images.

Re-sizing of image

We know any picture can be used in different means of communication, like – Newspaper, books, magazines, HD videos and on Web pages. Each format has its own limitation and pixel requirements. Magazine and Newspaper require higher resolution, say more than 300 DPI.

Re-sizing of image for webpages save lot of bandwidth and page loading time. Determining the right size for web image is only its “Pixel” size not resolution. Let’s say if the web page is 960 pixels wide, your image cannot be more than 960 pixels.

You can find the size of an image on the web.

1. First right-click the image in Firefox viewer.

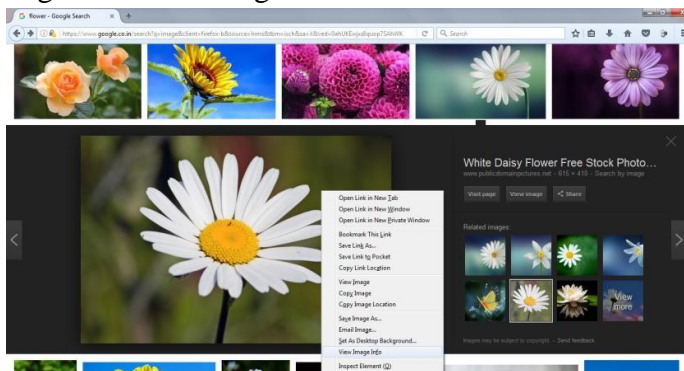


Fig 13 Screen shot

2. Select “view image info”
3. In the dialogue box you will see the file name, size, Dimensions of the image and all web page information.

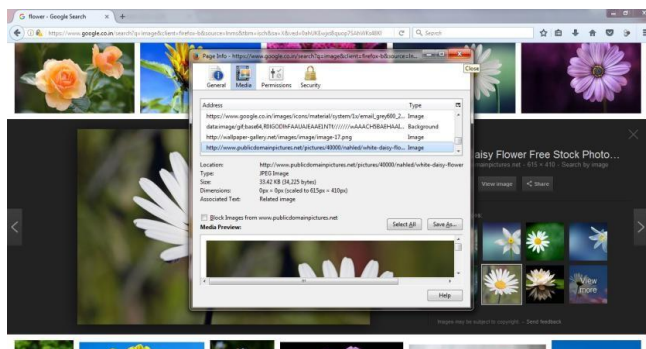


Fig 14 Screenshot

Understanding image File Formats

In this digital era, when you take a photograph or acquire any image from scanners what is essentially happens is the data was generated in form of Digital Image. This data requires to be saved for further use. Now there are several file formats into which this data was saved and retrieved, edited and transferred using several image editing software available today. Be it open source (free) or commercial ones. Digital artist / photographers generally use JPG, GIF, TIFF, PNG, DNG, BMP, PSD & RAW formats commonly for creating or capturing digital images.

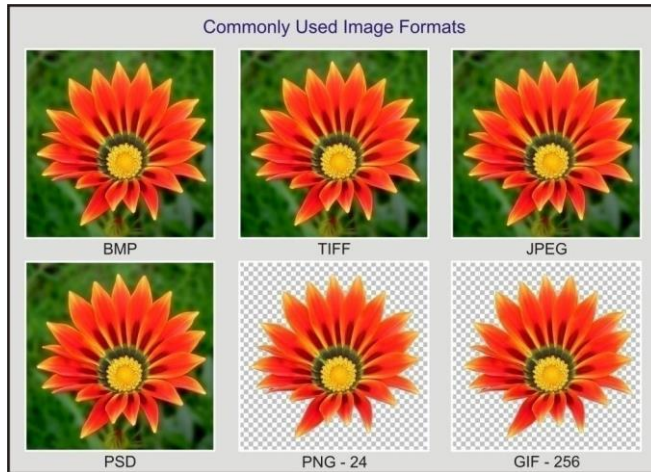


Fig 15- image formate illustration [Created by Author]

Some Digital Image files can be quite bigger in file size, which means they consume more disk space and slower to transfer or download. To reduce this, Compression technique is used to scale down the size of any file. Compression can sometimes reduce the image details leading to a hazy picture.

BMP (Bitmap Graphics): This is a Microsoft’s® uncompressed proprietary format. It is now universal format that saves each pixel data of image without any compression; which results to heavy file size and qualitative image resolution simultaneously. BMP images are assumed good and suitable for use in printing but due to bulky size these are not ideal for Web.

Advantages: These images have higher quality of pixels.

Disadvantages: Bigger size of image needs more storage space.

TIFF (Tagged Image File Format)

it is in principle most commonly and frequently used industry standard file format, it is preferred in printing industry due to its uncompressed and lossless feature. Due to this feature images saved under this format are bulky and much bigger in size. These files also take more memory and disk space. Sometime you may find ‘LZW’ term in software while converting to TIFF format. It’s Lossless compression algorithm’, This “LZW” is not universally supported by

some software. Most digital cameras now days have TIFF as the highest image quality level.

Advantages: It has ability to manipulate images extensively in editing software. Printing larger size and highest quality without any loss is also strength of Tiff.

Disadvantages : More loading/transfer time is required due to fat size of image that again leads to more storage or disc space requirement.

JPEG (Joint Photographic Experts Group)

This format is especially optimized for digital photographs and other identical rich tone digital images that contain wide range of colours. These files have ability to store compressed information in much smaller size. Most of the cameras stores digital images in JPEG format. A JPEG file can store pixel colour information as 24 bit colour. Its compression levels is so much balanced that photographs saved in this format are next to uncompressed quality, it is very difficult for the human eye to find any difference in quality. Sometimes even at large enlargements these files produced spectacular results without any blur or haziness. JPEG files help users to upload their pictures on web portals easily, as smaller size gets quickly uploaded on web. JPEG are not good for Line drawings or fine illustrations as these images, after compression, look jagged or broken.

Advantages: Smaller file size results in quick upload/download and more storage in small size discs.

Disadvantages: Loss in quality due to compression leads to limited image manipulation in any photo editing software.

PSD (Photoshop)

This file format is a proprietary formats used by Adobe®Photoshop® programs. It is by default saving format of Adobe®Photoshop® and allows user to save his document in layers. This feature makes it unique and easy to manipulate each layer separately without affecting other layer data. Layers are used for making complex images while editing and saving them as it is, while in other non-proprietary programs this feature is not available.

Advantages: Separate layers and accurate colour information are main USP's of this format.

Disadvantages: Due to more information the file size grows larger and larger by addition of Layers.

PNG (Portable Network Graphics)

It is also a lossless storage format. However, in comparison to TIFF format (indexed or RGB, 1 to 48-bits), it reviews the arrangement of pixels in the image that it can use to shrink file size. Transparency is also retained in these types of 24 bit RGB images. Normally PNG files are much smaller than LZW compressed TIFF or GIF format. In this format the compression is volatile; hence the image is recovered exactly. PNGs are much slower to read and write but these are good option for lossless quality with transparency work for saving photographs, PNG is considered as not so good format as compared to JPEG, the reason is it creates larger size.

Advantages: Lossless compression feature is its strength. It means during and after editing quality of image is not changed and its transparency feature remains as it is.

Disadvantages: PNG images are not good for high quality printing.

GIF (Graphics Interchange Formats)

This format is able to create up to 256 colours from available bandwidth of 16 million colours. If there are less than 256 colours in the image, GIF can render the image exactly. It was designed by 'Compuserve' in the starting days of computing era when computers functions on 8-bit video. This format is fine for computer and video screen images. GIF is not recommended for printing related designing due to less colours storing capacity. GIF format is "lossless" only for images with 256 colours or lesser and good for transparency in animated images.

Advantages: Animation and small file size is its uniqueness, it is ideal for web graphics.

Disadvantages: Due to limited colour use it is not good choice for photographs. It also not supports partial transparency.

RAW

These file formats are generally used on DSLR cameras while taking high quality images. Mostly RAW files are compressed using a process which stores all of information which was originally captured, like white balance, exposure, contrast, saturation, etc. The major drawback of RAW is that all manufacturers coded their RAW individually and according to their standards, which means you may have to use their indigenous software to view these images. Photographing in this format is very expensive in the manner of storage. This format requires lot of processing time and user must be capable of handling graphic editing software as after finishing some editing one has to share these images perfectly on internet or export them into various file formats.

Advantages: Images captured in this format are best in quality, Extensive options of editing and post production remains open due to best quality and details in pictures.

Disadvantages: Bigger file size and conversion from RAW to another format after editing is very longer process and time consuming activity.

Optimising Digital Images

It is the process of adjusting the display quality and lowering the file size of any digital image you are preparing for the webpage use or on other online media. You can also term it as ‘Conversion of Digital image file to a type that can be affectively displayed on web page’. It is a process to reduce the file size of an image so it can be quickly sent or received electronically across the World Wide Web. There are several programs available now in which you can optimize your images. Among those “Adobe® Photoshop®” and “Adobe ImageReady®” gives you more effective and wide range of controls for compressing the file size.

Now the question arise, why it is necessary to reduce the file size? Answer is, as you know that all web pages are downloaded into web browser window, it is good for user experience that all information on visiting page immediately opens up and all images on that HTML page appears without any wait. For this optimization of images is required. Without sufficient optimization, digital images file can increase the file size of web page which will slow down the download process. This leads to the increase in waiting time for users, sometime their patience lost and user become irritated and frustrated due to wastage of his time.

How the files are optimized?

It is very simple, if we reduce the visual information, i.e. colour or tones of an image we can reduce its size, but this also reduces the quality of an image. When displaying image resolution is lowered it is not taken as big issue, since the image is only for viewing purpose and not for printing. As you know the computer monitor’s display resolution is lower than that resolution required for printing.

There are two approaches for optimizing digital images:

- Basic image optimization can be done in Adobe®Photoshop® software by using “Save As” command. This lets you save any image as a GIF, JPEG, PNG, or WBMP file. Here as per your requirement, you can define quality, select transparency or matting, choose the colour display, and also determine the downloading method.
- For actual optimization, you have to use the given features of optimization in software like “Adobe®Photoshop®” or “Adobe ImageReady®”.There only you can preview optimized images in different formats and attributes. In this software you can see

different views of your image results after assigning required parameters you may get the desired result. Out of these best required image can be chosen. In these software you can also add and specify transparency, dithering can also be adjusted, and can resize the image to the required size.

Types of Image that can be optimized for web:

- JPEG
- PNG-8
- PNG-24
- GIF
- WBMP

Below here is step by step optimization process for PNG-8 and GIF format is described-

Solid colour areas are compressed in PNG-8 format along with retaining the sharper details. **GIF** is also a good format for compressing images. This format also retains flat colour and crisp details. Here also by reducing the number of colours you can decrease the size of your GIF images. PNG-8 is very similar to the GIF format in terms of file settings. Below is the image of Optimization Panel (*Fig 16*) which controls the conversion of optimization in Adobe®Photoshop®.

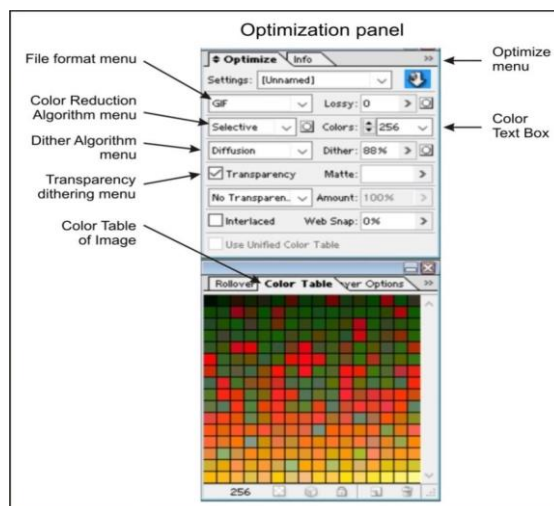


Fig 16 composition [Created by Author]

Colour Reduction Algorithm and Colours

For optimizing a JPEG image to GIF in Adobe ImageReady® first choose algorithm for generating a colour table from the Colour Reduction Algorithm menu. There you find some options like – Perpetual, Selective, Adaptive, Web, and Custom, Black and White, Grey Scale, Mac OS and Windows options. After choosing desired option, say ‘Perpetual’ or ‘Selective’

then choose the maximum number of colours from the Colour text box, For Perpetual, Selective, and Adaptive selection from colour reduction algorithm menu, you can choose 2 to 256 colours, while for others like - Web, Custom, Black and White, Grey Scale, Mac OS and Windows options you have option either to select 'Auto' or any number of given colours.

Dithering

Dithering is technique of simulating colours that are not available in your computer colour system. Solid colour images are good without dithering but those having continuous gradation type tone of **colour** must need this process (Dithering) because if it is not processed or dithered it may shows colour banding in image.

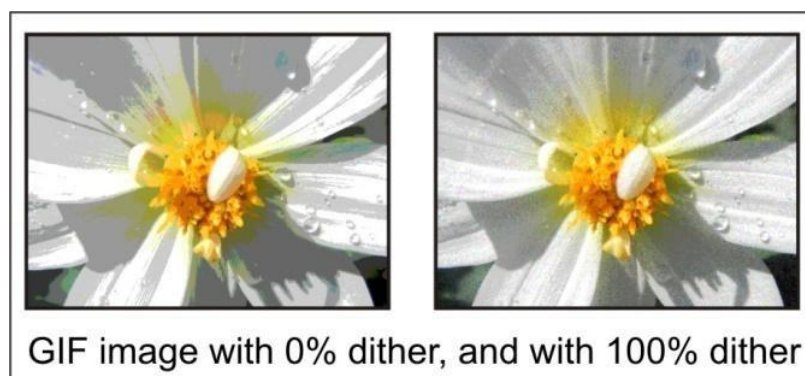


Fig 17 [Screenshot]

- If 'No Dither' is selected from the menu box then it won't be applied to the image.
- Diffusion control can only be applied to the random pattern which is very much less noticeable.
- Pattern option only applies like a halftone pattern.
- Noise option gives a grainy random like pattern which is very much similar to the Diffusion dither option.

Apart from above Dithering and Colour control algorithm there are some more controls, like 'Transparency', 'Matte', 'Interlaced' and 'Web snap' which you can try yourself and enjoy the results. You can use transparent image also by checking the Transparency box and then choose from drop menu; 'Diffusion Transparency Dither', 'Pattern Transparency Dither' and 'Noise Transparency Dither'. Try and use Matte option also for more dramatic results.

Let's optimize given below JPEG picture (Dimensions: Width 3648 Pixels x Height 2736 Pixels) and see how it appears after optimization in GIF and PNG-8 formats.



Fig 18 Screenshot

Go to 'File' menu bar, select Save for Web

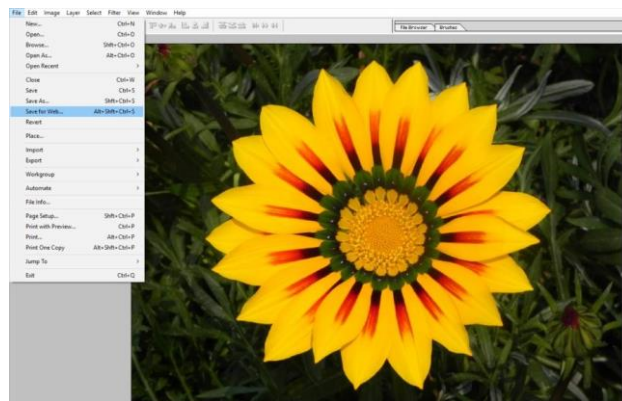


Fig 19 Screenshot

Then another window open up. In this window there are several options for adjustments. Choose 4-Up in top left corner. It gives you 4 displays of same image. You can assign different values to 3 displays, I suggest you to leave first one (Top Left) as original one for comparison.



Fig 20 [Screenshot]

Here in different windows (Except first one) notice that some information was given, i.e. file format, image size and Data transfer speed and time was displayed at bottom left of the window. In the right side Colour reduction algorithm menu, Dither algorithm menu and total number of colours presents in file are displayed.



Fig 21 Screenshot

Change the settings in colour reduction algorithm menu to ‘Perceptual’ and Dither algorithm to ‘No Dither’ with 256 Colours. See the result of New Size i.e. 2.44M and transfer rate 101 sec @ 256 kbps. It means this image is now reduced to 2.44Mega Pixel and will take 101 seconds @ the speed of 256kbps.

Now let’s try more options.



Fig 22 Screenshot

This time I Choose GIF File format and ‘Web’ in colour reduction algorithm menu and choosing ‘Diffusion’ with Dither as ‘0%’. Now image again reduced to 754.5K having transfer rate 35 sec @ 256kbps. See the colours chosen are web palette having only 55 colours in the image. Now I wish it to convert image in WBMP. Let’s see the result below.



Fig 23 Screenshot

Wow, here I get nice stippling B/w result of my image. See its transfer rate is 50 sec @ 256kbps and the file size is 1.19M



Fig 24 Screenshot

Output results shown in the above example of optimisation of JPEG image may vary from picture to picture due to their resolution, document size, colours and pixel dimensions. Illustrative example is only for demonstration purpose. You may get different results with different images.

Unit Summary

In this unit you learned about **Pixel and Bitmaps**. Based on prior learning you can practice importing the images and changing it size and resolution for different usages. You also learn the names of different image file types and their properties, Importing and exporting those files into different formats. You are able to reproduce the images by using various outputting techniques. In this unit you were able to recognise Square and non-square Pixels. Here you learn about x and y co-ordinates of pixel. We have also learnt step by step optimisation process of images for web usable images.

Assessment

1. What is a Pixel?
2. Differentiate between square and non-square pixels.
3. Describe the common aspect ratios used in video.
4. What is Resolution and Pixel Dimensions?
5. Write different types of file formats, and how do you choose these formats?
6. Write the advantages of JPEG file format. What makes this format more popular?
7. What is dithering?
8. Why Optimisation of image for web is needed?
9. Write the full forms of following :
 - (a) BMP
 - (b) PNG
 - (c) TIFF
 - (d) JPEG

(e) GIF

Resources

1. *A History of Modern Design: Graphics and Products Since the Industrial Revolution*, by David Raizman, Laurence King Publishing (February 9, 2004), [ISBN 978-1-85669-348-6](#)
2. Foley, J. D.; Van Dam, A. (1982). *Fundamentals of Interactive Computer Graphics*. Reading, MA: Addison-Wesley. [ISBN 0201144689](#).
3. John Naughton, *A Brief History of the Future: The Origins of the Internet*, Phoenix; 2nd Revised edition (5 October 2000), [ISBN 978-0-7538-1093-4](#)
4. Jakob Nielsen, *Designing Web Usability: The Practice of Simplicity*, Peachpit Press (January 2000), [ISBN 978-1-56205-810-4](#)
5. *The Art of 3-D: Computer Animation and Imaging*, 2nd Edition, by Isaac Victor Kerlow, John Wiley & Sons; 2 Sub edition (May 11, 2000), [ISBN 978-0-471-36004-9](#)
6. Derek Doeffinger (2005). *The Magic of Digital Printing*. Lark Books. p. 24. [ISBN 1-57990-689-3](#).
7. Poynton, Charles (2002). *Digital Video and HDTV: Algorithms and Interfaces*. San Francisco: Morgan Kaufmann Publishers. [ISBN 1-55860-792-7](#).
8. Harald Johnson (2002). *Mastering Digital Printing*. Thomson Course Technology. p. 40. [ISBN 1-929685-65-3](#).

Unit 3 Understanding Colour

Introduction

Colour is the basic element for any Art. It spreads the essence of composition to the viewer's eyes and brain or makes the viewer to feel the given composition. It helps in translating the image grasped by humans through their eyes. Since the civilisation of humans, colours have attracted the human beings. They had the passion for them. Later it transformed every part of their lives. Artist plays with colours to form different artistic form and compositions, which were accepted to eyes of patron like the poetry to ears. Putting right colours to any composition is highly skilled job and has some aesthetics behind them. In this unit we will learn the development process of colours since start and nature of colours, their use in compositions and making variety of colour harmonies from the hues and shade.

Outcomes

Upon completion of this unit you will be able to:

- Describe Color;
- Differentiate between primary, secondary and tertiary colors;
- Explain Hue, Value and Chroma;
- Practice using the proper color harmony;
- Explain Additive and Subtractive color modes;
- Practice optimizing Digital images;
- Practice converting images color modes;
- Use the Hexadecimal representation code for web colors

Terminology

Color Wheel : It is a circular shape consisting basic Hues with their values around a circle for creating different color schemes.

Electromagnetic Waves : Waves used in transmitting Long / Short / FM wavelength TV / Telephone / Wireless signals.

Infrared : Thermal in nature these rays extends from the edge of visible spectrum at 700 nanometers (nm).

Ultraviolet : These are also an electromagnetic ray shorter than visible spectrum.

Wavelength : Distance measured between the two high and low points in a wave.

Introduction to Color

What is Color? How do we see them? How colors affect our composition? These are some questions which come to our mind as a digital imaging learner. We will be going to address all such queries in this unit which will not only broaden the learner's knowledge about color but also make him better understand color schemes and their use in their digital compositions / animation scenes.

Color is not only very important element of composition but it also helps us in many ways in our day to day life. Our eyes see visible subject in the presence of light, which was processed by brain and then we recognize it. Hence we can say that Color is only a perception. We see what our eyes and brain tells us. When light was reflected from any object it was in different combinations of wavelengths. Our brain processed this wavelength combination and tells us about the image we are viewing or in other words we were able to identify the colors in that image.

Digital Images has vast numbers of colors in them. The least number in any image is only two colors, Black or White; only 1 bit for each pixel is needed for these types of images. It is also known as bitmapped 1-bit image, as it has a bit depth of 1. During the early stage PC's video cards support only 16 colors. Later on these were developed to display 256 colors and gradually, 16 million colors can be shown up in monitors. Now new display cards are capable of displaying 24 bits to each pixel, therefore more than 16 million colors can be displayed now.

In this unit we will learn the different color models, their usages, color mixing and visual effects of color combination, Color wheel, Hue, shade, tint and tone. We will also study history of color theory and color harmony schemes.

Color Theory

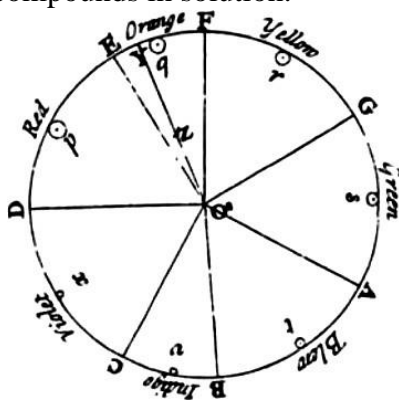
A Brief History

Humans have always had a passion for colors. Since early ages people had been using color as a mode of expression. Many civilizations, from early era to modern days attached symbolic meaning to color. They used to paint and decorate their bodies, masks, totems, dwellings, clothing and items used in everyday life as well as in the ritualistic life with their favorite colors. In many cases the colors represented their society, culture, identity etc. and were used in specific manner choosing specific colours only. Many archeological excavations discovered colored Pottery shreds, funerary remains; rock art which gives visual testimony that the colors, dyes and pigments were integral part of ancient human lifestyle. We see this trend all

over the world. Ancient and prehistoric multi-colored rock art that early humans had created using pigment colors for aesthetic pleasure and to convey their beliefs symbolically.

Over the centuries, artists and scientists have studied this affection for color by humans. There are numerous volumes of findings and research on color was done by scientists and artistic color theorists during the last three centuries. We can now enjoy the benefits of those findings as now we are using more scientifically developed tools like digital mediums for creating artistic compositions in which we can implement those golden principles for aesthetically sound designs.

Why do some people respond to some color schemes more favorably than others? Why some designs attracts us while some not appeals us and looks dull and unimpressive? It can be a subject to personal choice. After years of studies of color properties artists and scientists came to a conclusion and developed an organized way of displaying colors more scientifically which lead to the creation of “Color Wheel”. Several theories evolved during these decades to explain the relations and significance of color patterns, Hues and contrasts. Scientist like Newton, Holze, Wilhelm von Bezold, Johann Wolfgang Goethe and Albers derived their color theories on their experiments and measurable color attributes called ‘colorimetry’ in technical language. ‘Colorimetry’ or ‘colourimetry’ as it is called is a technique "used to determine the concentration of colored compounds in solution."

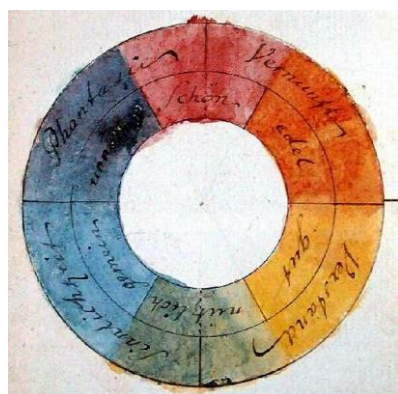


Title- Fig 01: Newton's asymmetric color wheel relates colors with musical notes and planetary symbols from 1704

Attribution- Isaak Newton - Opticks. 1704, from Book I, Part II, Proposition VI, Problem 2.

Source- Wikipedia

Link- https://en.wikipedia.org/wiki/Color_wheel#/media/File:Newton%27s_colour_circle.png

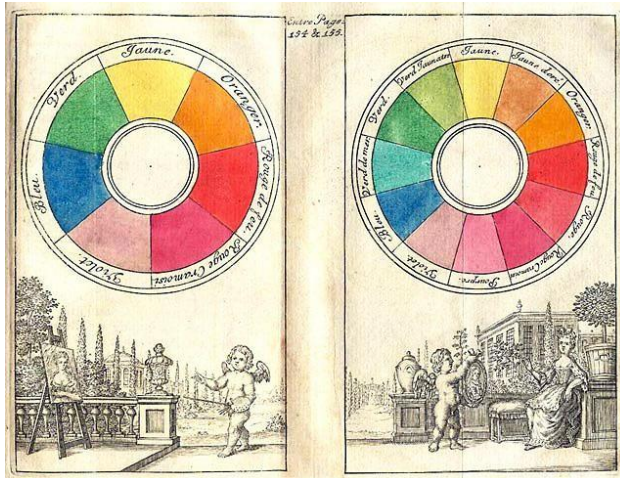


Title- Fig 02 : Goethe's symmetric color wheel with 'reciprocally evoked colours'

Attribution- [Luestling](#) at [German Wikipedia](#), Transferred from [de.wikipedia](#) to Commons by [Andrei Stroe](#) using [CommonsHelper](#).

Source- Wikipedia

Link- https://en.wikipedia.org/wiki/Color_wheel#/media/File:Newton%27s_colour_circle.png



Title- Fig 03: Boutet's 7-color and 12-color color circles from 1708

Attribution- [Luestling](#) at [German Wikipedia](#), Transferred from [de.wikipedia](#) to Commons by [Andrei Stroe](#) using [CommonsHelper](#).

Source- Wikipedia

Link- https://en.wikipedia.org/wiki/Color_wheel#/media/File:Newton%27s_colour_circle.png

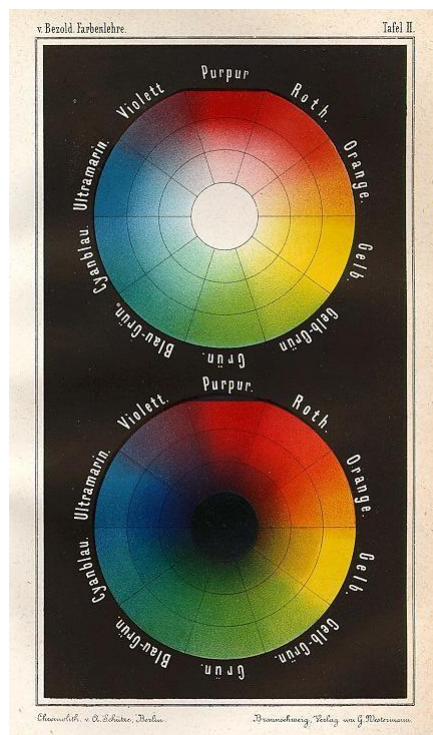


Fig 04: Wilhelm von Bezold's 1874 Farbentafel

Title- Wilhelm von Bezold's 1874 Farbentafel

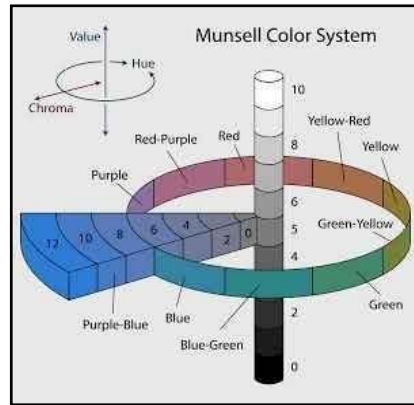
Attribution Wilhelm von Bezold

Source- Die Farbenlehre im Hinblick auf Kunst und Kunstgewerbe

Link- https://commons.wikimedia.org/wiki/File:Bezold_Farbentafel_1874.jpg

Basic of any theory is to distinguish color and give them precise name. For example if you choose Yellow, it can be bright sunshine yellow or a deep mustard yellow.

Albert Henry Munsell, (1898) an American painter and art professor in Boston, Massachusetts Normal Art school, developed a color-modeling system which is more scientific for literally naming the colors. In his study, Munsell attained a meaningful documentation of colors which is more organized and specific. He separated Saturation into ‘Value’ and ‘Chroma’. Munsell interpreted Chroma as difference between a pure ‘Hue’ and a ‘pure grey.’ Munsell identified following three independent components of color –



Title- Fig 05: Munsell Color System Attribution- Jacob Rus

Source- wikimedia

Link- <https://commons.wikimedia.org/wiki/File:Munsell-system.svg>

1. **Hue**—It is the quality through which we distinguish one color from another. He mentioned that wavelength of light differs according to different Hues.
2. **Value**—Munsell described value as “The quality by which we distinguish a dark color from a light one.” Value is a range between brightness and darkness of a color. Any color at full brightness appears “White” and when it is full dark it looks Black.
3. **Chroma**—Affluence of hue can be termed as color saturation. For example it differentiates between Deep Yellow and Pale

Yellow. If you add white color to Yellow, this will reduce its saturation or chroma, leading to the paler yellow.

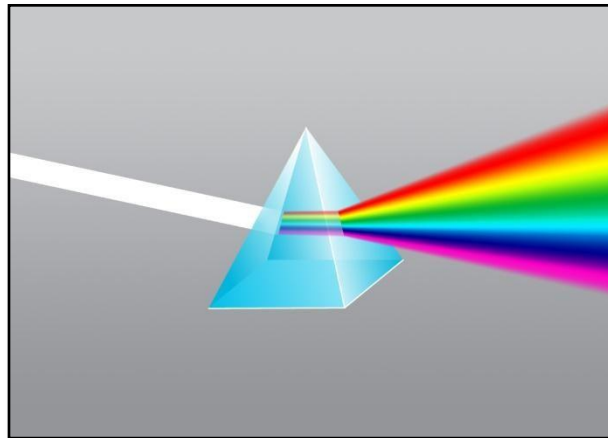
Chroma specifies the difference between pure hue and pure grey. Here it is important to note that the ultimate chroma of any color is represented by the hue of color. Let’s take an example; color with hue of yellow has lower chroma values as compare to color with purple hue.

How do we see colors?

When the light was reflected or emitted from any object to our eyes it contains color

element. To see the color you have to have light. This reflected light consist color information that our brain reads and process for identifying the objects or images. When light shines on any surface it bounce off some colors and other colors were absorbed. Our eye only sees those reflected or bounced off colors.

Sir Isaac Newton (1642-1726) was the first scientist who introduced the rainbow spectrum from the ray of light (*Fig 06*). He placed a prism near his window and saw 7 colors were projected out in form of ‘Violet, Indigo, Blue, Green, Yellow, Orange and Red’, also termed as “VIBGYOR”. Newton also proved that Light alone was responsible for color.



Title- *Fig 06:* Newton’s Prism Experiment

Attribution- Source- wikimedia **Link-**

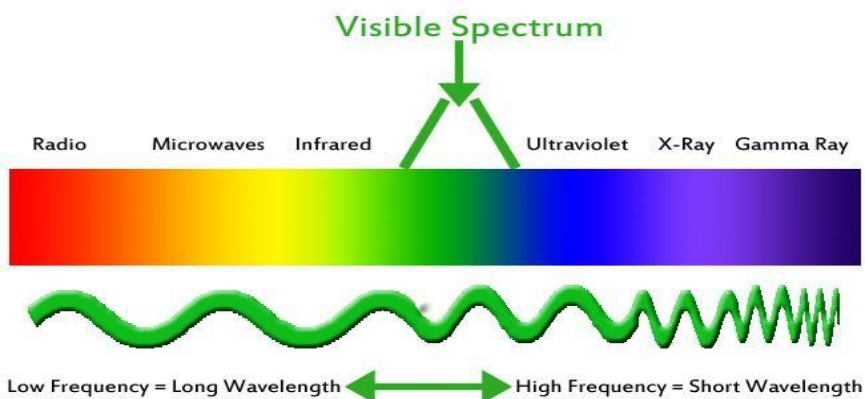
As we know that sun is a primary source of light which contains all colors, this rainbow when mixed all together forms pure white light. When this light falls on a white surface none of the colors are absorbed or in other words we can say when all colors are reflected back we see the surface as white. Similarly when this light falls on black surface it absorbs all colors and none of the colors is reflected back, then the surface appears as black.

When an artist paints something black, they use black pigment as a color but in light spectrum black is not a color. It is only absence of light or of all colors.

Light is a form of electromagnetic energy emitted from any source in the form of varying degree of waves (wavelengths). Every color has a certain wavelengths (*Fig 07*). Human eye can perceive only a small portion of these wavelengths that is known is ‘**Visible Spectrum**’; **the range of wavelength that is visible to naked human eye without the help of any special device**. This range of ‘Visible Spectrum’ is from 380nm to 780 nm (referred to as 400nm to 700 nm approx in most references) where ‘nm’ stands for ‘nanometre’ {a unit of length in the metric system, equal to one billionth of a metre (0.000000001 m)}.

At the each extreme ends of the ‘Visible Spectrum’ are violet and red color wavelengths and only up to this length humans can see. Red has the longest wavelength while Violet colour

has the shortest wavelength that is visible to human eye. There is another “Ultraviolet” color which is also a shorter wavelength but it is not visible to us. Only some birds and insects can see ultraviolet light. Likewise “Infrared” has a longer wavelength than that of Red color but human eyes cannot see this light too. This can be easily understood by this given below Figure (Fig 07).



Title- Fig 07: Visible Light Spectrum with wavelength

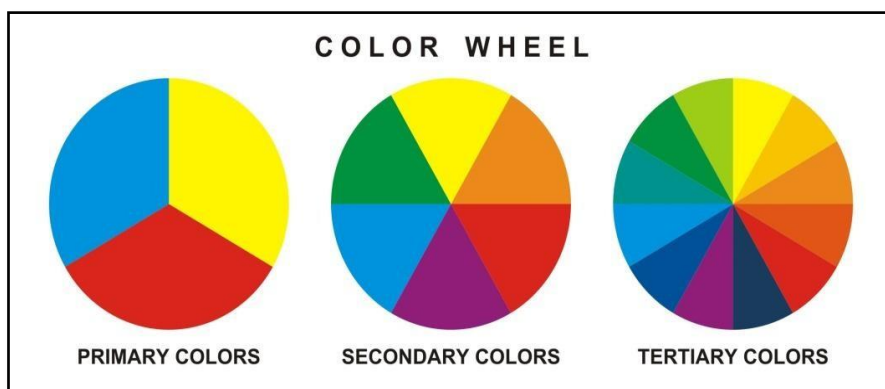
Attribution- [NetKismet](#) **Source-** wikimedia

Link- https://commons.wikimedia.org/wiki/File:Visible_Light_Spectrum.jpg

Color Wheel

The color wheel is a representative circle for all color Hues. It contains combination of colors of different values in purest form. It is designed in such a way that when any color is virtually chosen from it, it has interrelationship all together in a circular pattern. First color wheel was created by famous scientist, Sir Isaac Newton in 1666. Since then over the years, traditional color wheel has been changed several times with different shapes. Most of the color wheels express only primary and secondary color hues, and then show a vibrant relationship between analogous colors.

Traditionally there are 12 colors in a color wheel based on RYB (Subtractive Theory) color model (Fig 08). These colors are considered as pleasing colors and have harmony between them.



Title- Fig 08: Color Wheel

[created by author]

Besides RYB (Subtractive) theory there is another theory RGB (Additive). ‘Subtractive

Colour Theory is applied for pigment colours (the colours we normally paint with) whereas *Additive Colour Theory* is applied for light.

Numerous computer based programs are now available that function on the color wheel with interactive color wheel and is available for desktop applications and Internet as well.

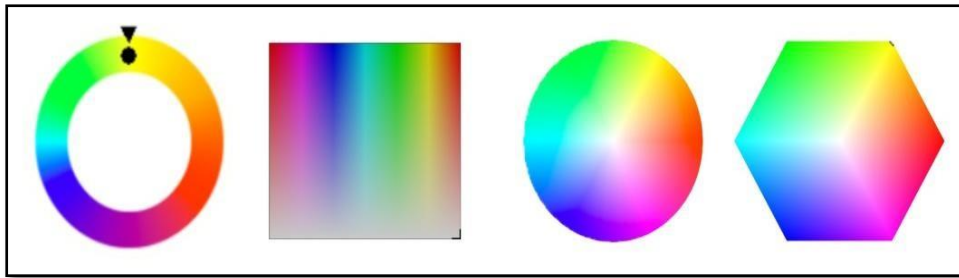


Fig 09: Some Different Types of Interactive Color wheel used in different programs. [Created by author]

Color Harmony

Color harmony is a type of balance or unity of colors schemes in any art composition or photograph. Color that is used in any composition must be soothing and pleasing to our eye. Our brain can easily distinguish the visual interest in composition and the sense of order that was created by the harmony of forms and color. Just keep in your mind that what you learned above in ‘color wheel’ that those color combination that are aesthetically appealing and pleasant can create more harmonious art composition. Once you are clear about color harmony you’ll be able to choose good color from thousands of colors for a balanced harmonious composition.

Creating Color Harmony

Successful color schemes can be obtained when you have good knowledge of Hue, Value and Chroma.

1. **Monochromatic** : This type of harmony use variety of tonal values (tints, tones and shades) within the same color family.(*Fig 10*)



Fig 10: Monochromatic Color Harmony [Created by author]

2. **Analogous**: These harmony use colors that are neighbors on color wheel (*Fig 11*) or can say next to each other. These schemes are serene and pleasing to eye and harmonious. In this color scheme three or more colors that sit side by side are used.

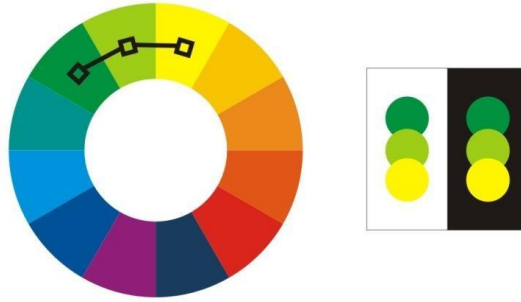


Fig 11: Analogs Color Harmony [Created by author]

3. **Complementary: Directly** opposite to each other colors on color wheel (*Fig 12*) are known as complementary colors.



Fig 12: Complementary Color Harmony [Created by author]

4. **Split Complementary: Three** colors out of which two on either side direct complementary from another single color arrangement results in this scheme. (*Fig 13*) This scheme has the same visual appearance in terms of color contrast as complimentary scheme has. This is good choice for artists as the colors used in this scheme are difficult to mess up.



Fig 13: Split Complementary Color Harmony [Created by author]

1. **Double Complementary: Under** this harmony two neighbor colors those are directly opposite to each other on color wheel (*Fig 14*).



Fig 14: Double Complementary Color Harmony [Created by author]

2. **Tetrad: Four** hues or four colors having equal distance from each other is known as Tetrad harmony scheme. (*Fig 15*) Under this square or rectangle shape is formed

virtually.

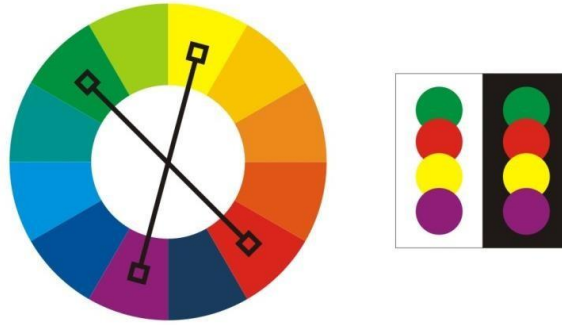


Fig 15: Tetrad Color Harmony [Created by author]

3. **Diad** : When two colors that sit two steps apart one other under this adjacent color is skipped are selected then formation of this color scheme is known as Diad. (Fig 16)



Fig 16: Diad Color Harmony [Created by author]

1. **Triad** : On color wheel when chosen colors are equally far away and form equilateral triangle. (Fig 17) To use triad harmony efficiently the colors you choose should be balanced.

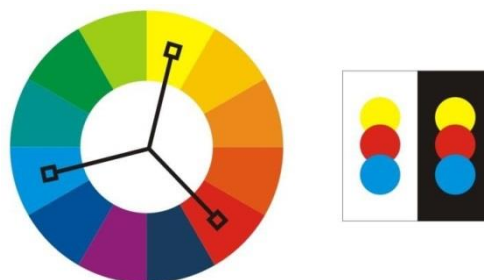


Fig 17: Triad Color Harmony [Created by author]

Selecting right color harmony in art composition creates more appealing message and impressive artistic look.

Color Contrast

Adding contrast in any art composition enhances the visual appeal. As it is clear itself by word contrast, that there should be some color difference between your visual subject and its background or surrounding area. The more you add color contrast between subject and background the more it appears visible and focused.

Contrast of color can be added to any composition in two basic variations, ‘**Value contrast**’ (light vs. dark color) and ‘**Hue contrast**’ (deference in color hue).

On color wheel complementary colors are just opposite to each other like Red and

Green, Orange and Blue. This color combination when used together in design creates good contrast in design composition. However you must be very careful by using complimentary colors Red and Green directly, these colors influence and pulsate when used next to each other in design. It is not advisable to use both colors directly in layouts, especially when you are using both color in text composition directly as Red in foreground and green as background or vice versa (*Fig 18*). If we print it on a black and white printer tonal variation will be very low, which means that our text is not clearly readable. Using high contrast, complementary colors are good in producing more contrast and readable look on screen as well as on paper (*Fig 19*). Lack of contrast between text and background can irritates the user, he may get confused which color to focus, this leads to the strain on the eyes of a viewer.



(*Fig 18*) [Created by author]

Important point after seeing above figure we observe that it is not necessary that complimentary color give desired contrast value. It is because this combination has maximum “Hue” contrast. For getting better results from this type of complimentary color scheme we need to adjust the value.



(*Fig 19*) [Created by author]

Itten's Theory on color contrast



Title- *Fig 20: Farbkreis* by Johannes Itten (1961)

Attribution- Zeichner: Malte Ahrens

Source- [de.wikipedia](https://de.wikipedia.org/)

Link- https://commons.wikimedia.org/wiki/File:Farbkreis_Itten_1961.png

Johannes Itten, Swiss painter and theorist was one of the early people who had defined and identify approach for good and effective combinations of color by his vast and deep subjective research. Itten had defined seven types of contrast plans.

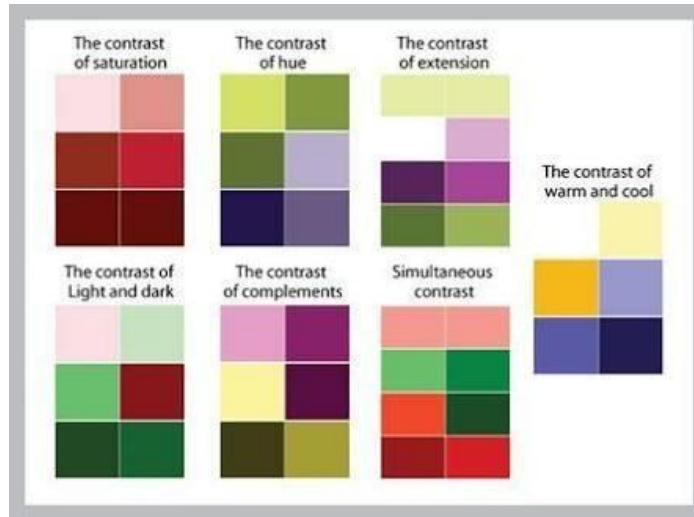


Fig 21: Itten's contrast color schemes [Created by author]

1. **Contrast of Saturation:** This contrast is between pure intensive color and neutral or grayed color. Dull color appears duller when they are placed near pure intense color.
2. **Contrast of Hue:** When contrast creates difference between Hues or by juxtaposition of Hues is known as contrast of hue. Wider distance between hues on color wheel creates more contrast.
3. **Contrast of extension:** when we need different amount of one color to balance other or the contrast of extension is used to indicate contrast between the proportions of color area of any shape.
4. **Light Dark contrast:** This is contrast between light values and dark values. Like Night and Day. This type of contrast is effective in monochromatic compositions.
5. **Complementary contrast:** Complimentary contrast refers to opposite (complimentary) colors on placed on color wheel which creates maximum contrast. For example, Yellow, violet, blue, orange, red and green.
6. **Simultaneous contrast:** Two or more colors which were not exactly opposite to each other from this type of contrast. Or in other words contrast between a color which is located on right or left of its compliment.
7. **Cool and warm contrast:** It refers to the contrast between cool and warm colors. For example, Blue, green and brown (Cool) contrast with Red, orange, Yellow (Warm).

Cool and Warm Colors

Warm colors are bright and fiery like sunlight, whereas cool colors are pleasant and soothing like water and moonlight. When we develop our designs it is a golden rule to first choose your background and foreground colors according the aesthetic sense. Firstly think about the color requirement of your subject. Choose color scheme from cool or warm colors. For example suppose, if we are designing a layout for 'Soft drink' it would be better to choose

‘Cool’ color scheme (Fig 22). As water, ice and chilled environment will give the freshness feel of the product i.e. chilled soft drink. This hidden message was communicated to the viewer more effectively. In this way viewer can assume or feel the chilliness of the product. If we replace the composition’s background color to Yellow which is considered as warm color (Fig 23), it completely changes the mood and appearance of the product as well as design.

Feel the difference of both color schemes in the given below samples.(Fig 22) and (Fig 23) are showing Cool and Warm color schemes respectively.



(Fig 22)

(Fig 23)

Cool color scheme

Warm color scheme

[Created by author]

Here another important point may be noted, in visual creativity “Thumb rules” can be changed, if they appeals more effectively.

Additive And Subtractive Colors Modes

These are two types of color modes which differentiate the mode or usage, be it for printing or viewing. We see colors in light waves, means mixing light in different combinations to form a certain color. This is also known as “Additive Color model” (Fig 24) as these RGB colors combines to create white. If you add all these colors together white color is created, as all visible wavelengths are reflected to our eye.

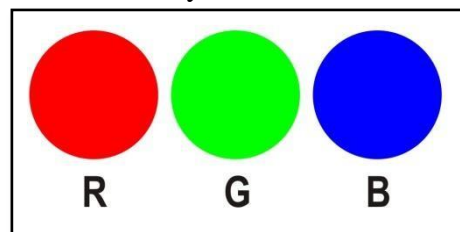
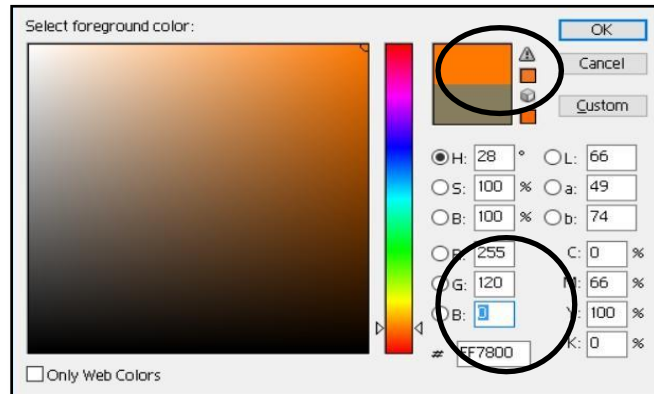


Fig 24: Additive Primary Colors

In this color model we see “RED”, “GREEN” and “BLUE” are the primary colors. This is also known as “RGB” color model. By mixing these light sources in various values or

intensities we get other secondary colors. Here it is to be notice that if more light we add, the brighter mix colors we get. When all these three colors lights i.e. RED, GREEN and BLUE we get “White” light. Our TV monitor screens and projectors use ‘Additive Color Model’ for producing colors. This RGB model produces intensity value from “0” to “255” to its each pixel for each channel. Here “0” is pure Black & “255” is pure White.

For example, if R=255, G=120, B=0 we see Orange color is formed (Fig 25) where red is maximum, green is medium, and color blue is absent.



(Fig 25) [Created by author]

Following table (Fig 26) shows how we can get RGB colors by assigning these values for creating some important colors.

Color	Red Channel	Green Channel	Blue Channel
Red	255	0	0
Purple	255	0	255
Yellow	255	255	0
Deep yellow	255	200	0
White	255	255	255
Black	0	0	0
Green	0	255	0
Blue	0	0	255

(Fig 26) [Created by author]

Second color model is known as “**Subtractive Color model**”. This is primarily used for printing technology; where colors inks are processed, mixed and printed on physical surface

i.e. Paper, Board etc. In this color model “CYAN” (C), “MAGENTA” (M), “YELLOW” (Y) and “BLACK” (K) are the primary colors (*Fig 27*) for this model (“K” is *used for Black instead of ‘B’ just to avoid the confusion with Blue*) It is also known as “CMYK”color model.

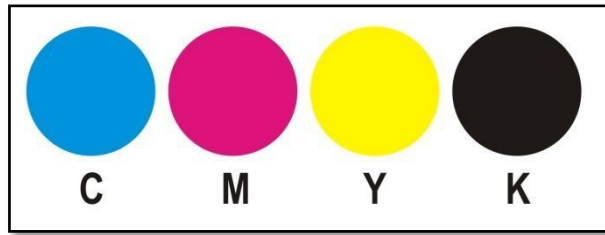
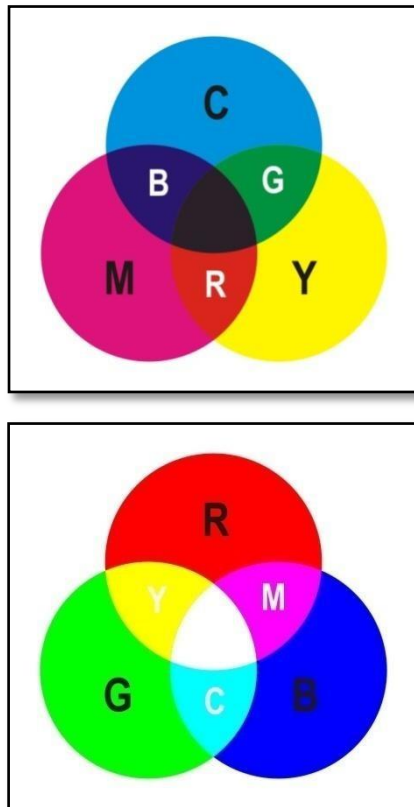


Fig 27: Subtractive Primary Colors [Created by author]

It is called “Subtractive” because it subtracts the light being reflected from the paper. Earlier RED, YELLOW and BLUE were the traditional primary colors for paintings that artists use as primary colors. Later, due to development in printing press technology, Cyan subsequently replaced Blue and Red was replaced by Magenta (*Fig 28*). Here it is important to note that this CMYK model is universal and more scientific to generate wider variety of colors by mixing this basic Colors (CMYK) on paper.

The additive (RGB) and subtractive (CMY) colors are complementary colors. Each pair of additive colors makes a subtractive color, and vice versa.



(Fig 28) [Created by author]

Printing CMYK image on paper through subtractive color mixing method produce more accurate results. If you have RGB image for printing, it is better to convert it to CMYK in any

image editing software before sending it for print.

Color And Graphics

Graphic display whether it is of any type first attracts attention of the viewer and then holds the viewer to read the details. Here color plays an important role for communicating message to the viewer in short and quick time. In certain mediums of publicity, visual engagement in advertisement must be very rapid, and we have to communicate the viewer within the fraction of a second. Say, in Television ads, Highway side hoardings, Packaging of products, Display on multimedia kiosks and web site banner pages are some mediums where we have time limitations. We have to communicate and register the message on the viewer's memory within given time. Here 'bright colors' clamor for attention, as they are loud. 'Subject' on darker background attracts the viewer as it looks like neon signs of with lighting effect. Artists can achieve this type of effect by using direct hues on a black background.



Fig 29: Sample Web page layout [Created by author]

Here one has to take care about the usage of bright colors as these colors should not remain for long. However, because it loses its effect quickly, one of the main reason is our eye briskly becomes lethargic to this harmony. Hence it would be better to use more balanced color scheme. Colors themselves have certain emotional qualities, which derive from natural situations and traditional usage. Artists should use color psychology in extensive manner so as to achieve the desired results by choosing suitable color schemes in their compositions. Your design will achieve success when the viewer should retain something memorable. Human memory usually stores colors as brighter as and purer than they actually are.

Colors have psychological and emotional power which can be effectively used by choosing appropriate color schemes. For example, if you want to say some mellow or soothing information through your design, use 'cool colors' but when communicating some hot and fiery energetic visual it is better to use 'warm colors'.

If there is any doubt in selection of right color scheme, the best method is usually to choose a light color for the background, and a dark color for the foreground or text matter.

When you want to draw attention of viewer to a specific portion of your composition, make its surrounding area different then the text try to keep it simple and legible.

Using color effectively in graphic layout is not very complicated subject if visualizer has taken care of certain rules. Though there is no guaranteed formula to work in all cases, but still try the following influencing factors.

1. First confirm the color need of your layout.
2. Try color harmony as per requirement of subject.
3. Be consistent in using color throughout your composition or layout.
4. Use color considering visual variable.
5. Never use those colors that are not required, use them sparingly.
6. Use color to improve object recognition and establishing identity.
7. Colors have some symbolic communication also. Hence, use them according to cultural and psychological feelings.

Colors For The Web

Designs created for web pages have some color restrictions. If you desire that your web pages appear on all monitors with the same quality result, you must choose among the 216 colors. Much software like Adobe® Photoshop® etc. now have the option to convert colors to web safe palette, or use browser safe palette as your default, like Dreamweaver® software where HTML picker is also available.

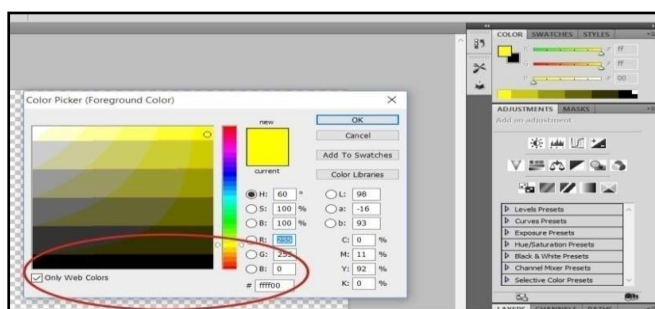


Fig 30 : Photoshop® color picker when only web color is selected [screenshot]

Colors for web are coded either by names or by “Hexadecimal representation code”(Fig 31) of RGBs color component. 16 colors that are recognized by all browsers are as below.

16 basic color			
Color Name	#RGB Triplet	Hexadecimal Code	Color

Red	255, 0, 0	#FF0000	
Lime	0, 255, 0	#00FF00	
Blue	0, 0, 255	#0000FF	
White	255, 255, 255	#FFFFFF F	
Black	0, 0, 0	#000000	
Aqua	0, 255, 255	#00FFFF	
Fuschia	255, 0, 255	#FF00FF	
Yellow	255, 255, 0	#FFFF00	
Grey	128, 128, 128	#808080	
Green	0, 128, 0	#008000	
Maroon	128, 0, 0	#800000	
Navy	0, 0, 128	#000080	
Purple	128, 0, 128	#800080	
Olive	128, 128, 0	#808000	
Teal	0, 128, 128	#008080	
Silver	192, 192, 192	#C0C0C0 0	

Fig 31: Hexadecimal code chart [Created by author]

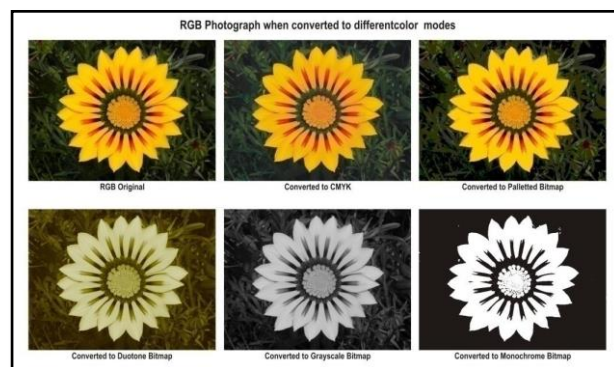
The differences in color vision of the viewer's and monitor settings and operating system are some factors that can destroy any possibility of color accuracy. It is possible that color or tone of your photograph used in your design may not appear as it is. Another factor is “Gamma” that is responsible for the lightness and darkness of any image. Since different systems have separate Gamma standards, many doesn't have sufficient gamma correction feature.

This short coming of image format was addressed in “PNG” image format which is capable of holding extra detail of color information. Most of the browsers now support PNG format. However this format cannot compensate for flawed gamma correction and other computer display limitations.

Converting Image Between Color Modes

Sometime we need to convert our image mode considering their output result, especially when we go for offset printing. As we have already studied in detail about ‘Subtractive’ and ‘Additive’ color modes. You are aware that images are captured by digital cameras in RGB or additive mode. These images need conversion to CMYK or subtractive mode for printing. This conversion can be done through any image editing software like Inkscape®, Krita®, Adobe® Photoshop®, Coreldraw® etc. Although on computer display you may not be able to notice the difference between CMYK and RGB image, but they are quite different. Their output result appears after printing. Visual spectrum of RGB color mode is wider than the CMYK mode. While image having same dimensions, a CMYK image has a larger file size as compared to RGB image. This is due to different channels that are necessary for printing technology standard for inks.

When color mode is changed it also results change in its value simultaneously. For example, if you want to convert an RGB image to CMYK mode some values of RGB that are outward to CMYK color gamut are adjusted according to CMYK gamut. Here some color information is lost as CMYK has different gamut than RGB. Hence it is good that you may do all adjustments or editing in image’s original mode before conversion. Always save a backup copy of original image, including all layers.



(Fig 32) [Created by author]

Each time when image is converted, it may lose some color information. Therefore do all necessary editing and flatten the file before converting it so the necessary details may not vanished. Interaction of color between each layer will also change along with conversion of mode. Image conversion can be done in other modes like RGB to Grayscale, Index color, Labcolor, Duotone, and CMYK etc. and vice-versa (Fig 32).

It is Important to note that if an RGB image is converted to Grey scale or Monochrome Bitmap and was saved it is not possible to revert it. So it would be better to make another copy of it and do whatever changes you want.

Unit Summary

In this unit we learnt history of color, color theories of different scientists and painters like Albert Henry Munsell and Swiss painter and theorist, Johannes Itten's theory on color contrast. We also learn the color harmony and discussed eight different color schemes. After it we discussed warm and cool color combination scheme and their correct usage and selection for our color compositions.

We also discussed Additive and subtractive modes of colors, their properties and areas of usage. Under color for graphics you learn how to choose relevant color for different means of communications i.e. for Hoarding, TV commercials and web page. We also discussed web colors, how they appear on screen when used properly or suitable color scheme. We learnt the prominent 16 color names their RGB tonal values and hexadecimal code that were mainly used in web graphics or web pages. Contrast in tonal value, as well as Hues have important role in any design. We also cover the conversion between RGB and CMYK color modes.

Trusting your intuition, as well as theoretic knowledge is major important aspect in your design. Giving some meaning to you design through color also we had covered in this unit. By adopting these certain rules you can assign the mood, give cultural and aesthetical meaning to you designs and connect psychologically with your viewers.

Final words, try to use various image editing tools, such as: Inkscape®, Krita®, Adobe® Photoshop® for creating different compositions. Study pattern of websites, their color scheme and take note of the color combinations used. This will give you confidence and aesthetically you'll be able to communicate the message of your artwork more effectively.

Assessment

1. Describe a color wheel and explain its purpose?
2. Define primary colors?
3. List secondary colors? How are they created?
4. Differentiate between complementary and analogous colors? Where do you found these one on the color wheel?
5. Colors that are next to each other on color wheel are known as_____.
6. If you add some black to a color, that is called_____.
7. If you add white to a color that is called_____.
8. What are color contrasts and why are they important?
9. Describe color dominance in graphic design.

10. What is color contrast and how would you use it in Web design?
11. Differentiate between warm and cool colors? Site examples of each.
12. What is saturation of color? How can it be achieved in a tool such as Adobe® Photoshop®?
13. Describe color models? What is the difference between print and computer screen color models?
14. Explain the use of Hexadecimal code in making web layouts.
15. Describe the Itten's Theory on color contrast. How it is useful in designing.

Resources

1. https://en.wikipedia.org/wiki/Color_wheel
2. Itten, Johannes, and Birren, Faber (1970). *The Elements of Color: A Treatise on the Color System of Johannes Itten Based on His Book The Art of Color*. New York: Van Nostrand Reinhold. ISBN 0-442-24038-4
3. *Itten, Johannes (1973). The Art of Color: the subjective experience and objective rationale of color. New York: Van Nostrand Reinhold. ISBN 0-442-24037-6.*
4. Martha Gill (2000). *Color Harmony Pastels: A Guidebook for Creating Great Color Combinations*. Rockport Publishers. ISBN 1-56496-720-4.
5. Simon Jennings (2003). *Artist's Color Manual: The Complete Guide to Working With Color*. Chronicle Books. ISBN 0-8118-4143-X.

Unit 4 Visual concepts and Graphics preparation

Introduction

In this unit we will describe the development and use of computer graphics in the multimedia production. As the visual information is most important content of any production; graphic plays the key role in making any video program more interesting and informative. Since major development happens in technology by the invention of computer; graphics too had also developed with the same pace. In this unit we will discuss the components that were used in making computer graphics, like fonts, images, Illustrations etc. Making and composing graphics in tune to the display resolution, content related and easily understood by the viewer are some points that we will learn in this unit. What cares and measures can be taken for creating a good visual that would be informative, attractive and simple.

Outcomes

Upon completion of this unit you will be able to:

- Define Graphic Designing;
- Design TV Graphics in Standard and High Definition Formats;
- Practice the use of Illustrations in Graphics;
- Practice making all types of Graphics like Titles, Tickers, Credits etc.;
- Explain Title safe and Action safe Margins;
- Differentiate Vector and Raster Graphics;
- Generate Graphics for Virtual World;
- Prepare VFX (Visual Effects)
- Illustrate Info graphics and use them as Visuals in Multimedia Production

Terminology

2D & 3D: 2D images have only 2 axis 'X' and 'Y'. Which means the image is flat like any drawing on paper. However in 3D space search image has a third dimension i.e. 'Z' which means the sense of depth.

Adjustment layers: This is a type of layer that's used to apply effects to multiple layers at once. Whenever any effect is applied to a layer it affects only that particular layer to which it was applied. With an adjustment layer the effect created on the adjustment layer can exist independently of the other layers.

Alpha Channel: Alpha channel is reserved for transparency data, and are mostly represented as a black and white image. If there are gray areas this will show a semi-transparent area.

Anti-aliasing: It is a process of smoothening broken edges on graphics. Shaded pixels were created in between the areas of high contrast when this option is selected.

Composition: A composition is the basic building block of the video. A typical composition will contain multiple layers of information like video, images and audio.

Frames: Frames are the individual images; when played at a certain speed make up a moving sequence.

HSB : It is used for color settings. Hue, Saturation and Brightness are its form.

Kerning: It is the space between individual letters. For example if you'd want to kern a small case letter "o" to fit underneath the capital letter "T".

Leading: Leading is known as the spacing between the lines.

Tracking: Tracking is used for adjusting the space between letters used in captions.

Typography: Typography is the technique for arranging type. Sometimes typography is well done and easy to read which the success in terms of good composition is.

Origin Of Broadcast Graphics

It is well known that the origin of broadcast graphics, in television technologies, came from film. Since all the graphics from Opening Title to end Credit rolls were designed as like for Films. **Saul Bass** (1920-1996) was the very first motion graphic designer during the initial days of invention of Television, who had an expertise in generating Graphics for Film as well as Television. Prior to the invention of computer generated graphics technology he designed various opening title sequences for popular films such as: **The Man with the Golden Arm** (1955), **Vertigo** (1958) and **Psycho** (1960). Bass, who was also known as pioneer of motion graphics was an extremely talented and productive designer. If we judge his work by today's standards, Bass' contemporary graphics designs seem comparatively very simple and uninterested, but they were much attractive, effective and considered as best state-of-the-art at that time. At that time all television or film graphics were created manually by hand on paper or directly on film without the assistance of any technical equipment, like computers, Character Generator etc. Designing Handmade illustrative Graphics were extremely time consuming and expensive affair at that time.

Later on by using some initial devices like Rostrum camera, Graphic design starts to become little bit automated. This camera can produce several types of shots, hence lots of effects were achieved by early art directors and designer who starts experimenting and using different techniques of making graphics. It leads to invention of cell animation process. This is a

vertically mounted camera and have fixed path for the upward and downward movement. Any artwork was placed in front of its bench which is also pressed by glass to so that cut outs may not fold. This bench has markers and scales also called 'Pegs'. When any artwork is placed above this bench several effects and movements can be achieved which were shot or exposed on 16mm film. This Rostrum camera is used for filming 2D animated captions, animated scenes for cartoon films etc. frame by frame. Once these films are exposing by taking series of shot, next step is to develop and process these films. After processing, editing was carried out by cutting and pasting the exposed shots in linear way so it will match with audio track also. After this long process and wait animation or graphic was ready for use . Later on computers comes to the help of designers in by automated control of rostrum camera. This adds to capture some more complicated moves and motions of Rostrum camera, such as 'slit-scan' and 'streak-timing'.

Graphics preparations for Television are very costly and time consuming affair. It was generally used in film and high budget television productions. After the arrival of computers in 1960s render able computer graphics came into existence when Charles Csuri and John Whitney become the early users of computer aided animations. Later from 1980-90 several graphic systems like, Quantel workstations, 'Paintbox' become the standard graphic machine. Several other brands like Ampex, ADO, Abekas and K-scope were also used for creating motion graphics. Those computers have many limitations and since their processing was too slow it is very much time consuming to transfer the output on Tape media. But any how these old beasts rule the world of graphics.

When desktop based Adobe®Photoshop® entered the market in 1990s it drastically reduced the price of producing Graphics. As it is a cheaper solution for computer designers, and also easily operated due to user friendly software programming. It also has lots of filters and controls on digital image editing. Afterwards some other programs like Adobe®After effects®, Discreet Combustion®, Apple Motion® comes as a tool for computer designers. Later on Aston Broadcast system and Chyron Corporation's invented character generators which were more suitable to incorporate motion graphics.

Autodesk's Maya® and 3D Studio Max then steps in, as they are pure 3D modeling and rendering programs which are very useful in creating virtual environment and models. There are some other open source programs widely used for creating 3D animations like 'Blender®' and for 2D image editing 'Inkscape®' and 'Krita®'. Blender® integrates several 3D functions like their counterparts Maya® and 3D Max®.

Future of Computer Graphics

Looking the rapid pace of day by day improvement in computer graphics, it can be seen

that confluence of television, computers and mobile devices when connected on internet helps in creating more interactive forms of television graphics. Here the Internet will almost certainly play an important role in telecast of new media where graphics are utilized for the enhancement of viewer's grasping and accepting the complex information power. Edsall (2008) states that combination of television and computer creates "tele-puter" which can enable viewers to interact more effectively with their devices. There are some devices already exists that helps the viewer to interact with streaming of programs across on web and can watch their favorite shows when they want them on even multiple devices. Logically now interactive graphics are becoming more realistic and becoming the integral parts of our life which is allowing the users to connect with new media techniques and technology.

Graphic Designing

Graphic design is a pictorial language composed of different signs, symbols, logos, pictures and Texts. It is a designer's role to arrange the visual elements in best effective manner so as it appears artistic and communicable. Composition is one of the most essential features of graphic design especially when designers use diverse elements and materials in their compositions. For creating any graphic visual designer creates and combines symbols, images, texts in given size (page layout or screen size) as per the subject and requirement. Graphics are commonly used in Television graphics, Magazines, Newspaper, Webpage, Product packaging and several other outdoor/indoor publicity. For example for any consumer product publicity it all starts from Logo of that product. This logo helps in registering the brand image of product in consumers mind. Then other layout like Label, advertisement layouts, danglers, brochures, hoardings, TV commercials and web advertisements all are created in harmonious way by using organized text and pure design elements which we have learnt in "Unit 1 – Introduction to Digital Imaging" under the aesthetics and principles of designing.

Along with the role in visual designing, graphic designers today lend their visual skill expertise in various disciplines like branding and broadcast design, design consultancy, signage and other modern ways of outdoor publicity as the designers have aesthetically visualizing power in drawing, photography, composition and typography.

Earlier graphic designers have limited fields in which they work. Some are expertise in coloring, some loves to sketch and some has passion for photography. Now after the introduction of various digital tools and techniques graphic designers has a bigger territory now. Desktop graphic design, web designing, animation, special effects are some new arenas where creative visual engineers can prove their capabilities.

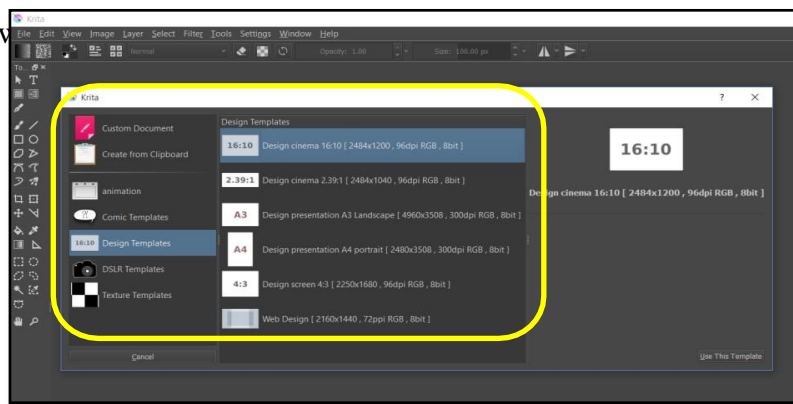
Designing multimedia graphics is one of the very specialized field where creative

designers can do most of the effective use of digital technology. When designing multimedia graphics, one should take care of the size and ratio of the output display size which we had already discussed in unit-1.

Usually our display size of Television will be either 4:3 or 16:9. After selecting the size select square pixels or non-square pixel format as some editing systems cannot support square pixel dimension.

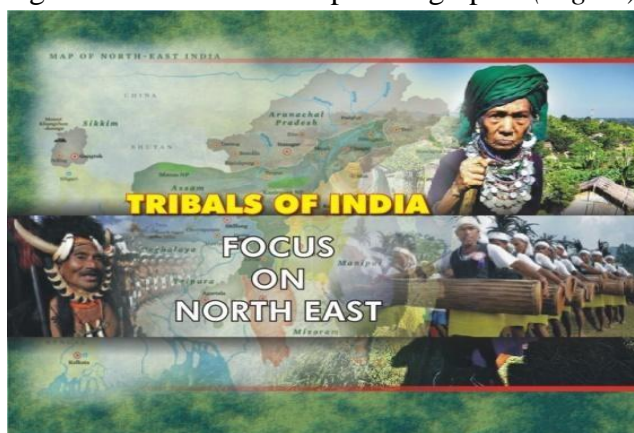
For creating graphics in 4:3 (standard definition) television

Select the size of your document in Krita® software. Go to File →New, Here you may find some pre-defined templates with aspect ratio under ‘Design Template’ menu. (Fig 01) You had already learnt about different sizes of video and film in Unit 01 of Block 01. Krita® similarly helps us in choosing appropriate size from 4:3, 16:9 & Web Design for making standard TV or v



(Fig 01) : For creating new document in Krita® Screenshot

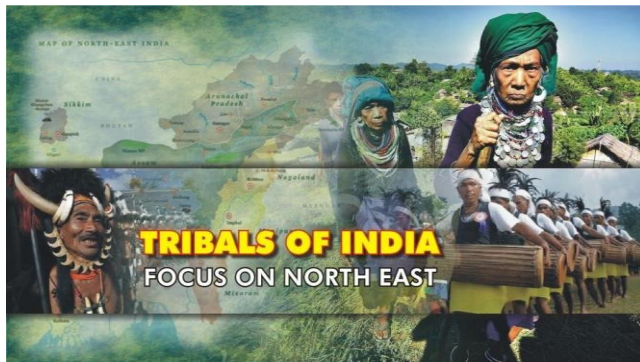
Choose ‘Design screen 4:3’→select ‘Use this template button.’ New Canvas was created in Krita® afterwards Import pictures; create backgrounds using gradient tool or do what was the demand of subject. Use contrast color for fonts. If needed give some shadow or outline to separate it from background. Below is a sample TV graphic (Fig 02).



(Fig 02): Standard Definition (4:3) caption Standard Definition (4:3) Caption [Created by author]

For creating graphics in 16:9 (High definition) televisions

Similarly you have to select from default ‘Design Templates’ or from ‘Custom document’ assign the size: 1920 x 1080 for making High definition TV graphics. Following is the example of HD size (*Fig 03*). Observe the difference in the space and composition. In HD format we have more space horizontally as compared to SD format.



(*Fig 03*): **High Definition (16:9) Caption** [Created by author]

You can find some preset sizes in Adobe® Photoshop® specifically for TV graphics.

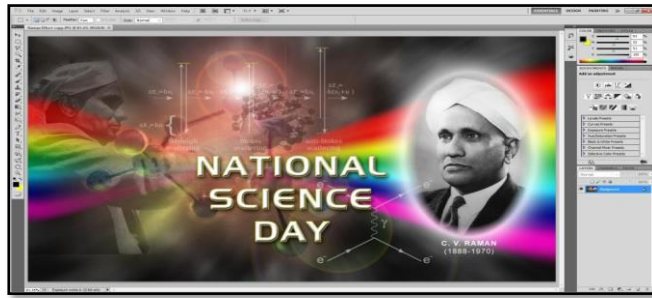
Implications for Design

Before composing any Television graphic, we need to think and observe what are we trying to communicate? What is the informational requirement of our graphic or a design? With the answer we can concentrate only on those elements or visual that is useful for design. If the purpose is to enhance recognition then you need to focus on those elements by using things like contrast, scale, and dominance. To extend knowledge and reasoning, make visuals clear and informative that are easy to interpret. First think about your overall outcome, how it appears after completion and also the individual design elements. Question yourself, what is the purpose of using such elements in your composition. You probably want your Graphics to be recognized and leave impact on viewer’s memory. Your efficiency and visual content can be understood by mass audience. In order to create successful designs it is must to observe the cognitive tasks of our visitors.

Graphic Requirement for TV Program

T.V. Graphic adds clarity to a show’s presentation. They are used to announce about the content of program through Illustrations, Texts, and Animation etc. Graphics can make a valuable contribution to all type of Television programs, Statistical Graphics in the form of bar graphs and charts enable the viewer to understand the complex data in simplified. Likewise illustrations can be used in children’s story, to set the scene in a drama, to explain scientific principles, to provide an atmospheric background to titling and so on.

There are different types of graphics used for Television production.



(Fig 04): Opening Title Caption (16:9) Screenshot

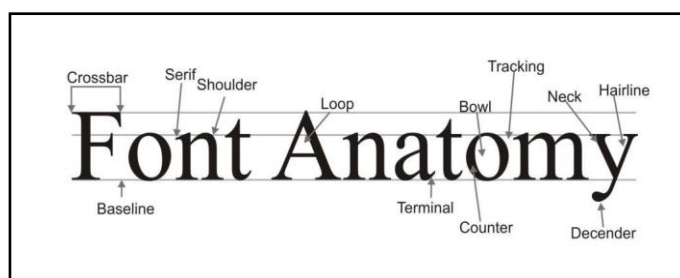
- **Opening titles** announce and introduces the Show.
- **Subtitles** identify people and places.
- **Illustration, Maps, Animated info graphics** are some visual inputs that can be used in lieu of live visuals or to communicate the complex nature of information in simplified form of graphics.
- **Tickers** are Crawling text matter that continuously runs down bottom of the screen with various info and advertisements also.
- **Credits** names will be given to those who were the part of any production.

Preparing TV Graphics

It is the golden rule that first understand, and then be understood. It is very clear if you understand the concept of program for which graphics are to be prepared, you can create more effective. For example, if the script is about natural disaster, using subject related visuals in your composition and try to even give create or choose your fonts that give the feel of disaster. It is simply by adding cracks/fire/distortion in your text. This will give the impression and feel of subject and supports your visual in communicating to the viewer more effectively.

Think clearly about the purpose of your graphic. Choose what information is useful for putting on screen in graphic. It is very important that information on screen has some message and visually understandable to the viewer. It is more important how clearly the viewer would understand what you are trying to show and what viewer will learn from this graphic?

Generally solid colors are the better options for Graphs, Pie and Charts. Using two color gradients can also enhance the backgrounds. Texture can also be over layered on this gradient background.



(Fig 05): Font Anatomy [Created by author]

Coming to the text/font part; chose proper fonts size that is readable. There are two types of fonts used in typography. “Serif fonts” and “Sans-serif fonts” it is advisable to use sans-serif fonts like ‘Aerial’, ‘Helvetica’, ‘Futura’ etc. type of fonts as they have uniform thickness. Finer line and Serifs are not present so their appearance on screen is loud and visible even for less duration these fonts are readable. While ‘Times Roman’, ‘New Century’ and ‘Zapf Chancery’ type fancy fonts have serifs and their body and shoulder have fine lines which can become unreadable at less than 72 point in size. Script type fonts can be used for Headings if required. It is advisable to avoid these fonts for body text.

While making info based text captions or slides, where there is lot of information given in textual form, try to give only 6 to 8 lines per slide or caption. Break up the text and use bullets in formatting to highlight important points. Caption on screen will remain for 10 seconds, so try to accommodate only that much text which was readable in given duration. Long duration caption on screen make viewer uncomfortable and uneasy. Try to split the information in two or more captions by giving some transition effects such as dissolves, wipes etc.

Here you must think in terms of brightness and contrast. Right color scheme having good contrast which separates the foreground and background elements. Use either light letters on a dark background or vice versa. This harmony we have already learnt in Unit-3 “Color” of Digital Imaging.



(Fig 06) : Example of Separate and Overlapped compositions [Created by author]

Delicate text or foreground elements need not to be used until very much required. Complicated backgrounds whether still or animated need bold foreground elements especially ‘Text’. Try to add depth into your artwork if possible. Overlapping Pictures, creating shadows, are some techniques to show depth (Fig 06).

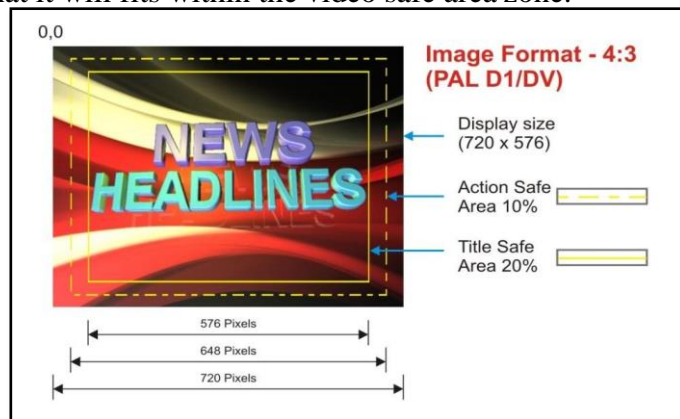
Title Safe And Action Safe Margin

The title/action safe area is that area which is left around on each side of the frame as a safety of our visuals and Text matter. It is easily visualized by gridlines demarcating areas of a screen. Earlier on certain types of televisions some areas may be cut off so to make sure that the

text and graphics information remains intact it is advisable to keep your objects/elements within the safe region. Readable parts need to be inside of the “Title Safe Area”, while the “Action Safe area” is a larger area which acts as more of a margin for the television. Here within this area objects or models in picture / videos should be composed.

Since now we are generally using two types of video formats for multimedia or TV productions i.e. Standard Definition (SD) and High Definition (HD). Sizes of both formats are quite different; where SD format or generally termed as PAL D1/DV has 720 pixels x 576 pixels on width and height co-ordinates respectively (*Fig 06*). While HD format has display size of 1920 pixels x 1080 pixels on its width and height co-ordinates respectively (*Fig 07*).

10% Area is left for Action / Video safe zone and another 20% is left as Title safe zone for SD video display. Hence it is recommended to just compose the titles or written graphics within this portion and not exceeding any lengthier line of text more than 576 pixels in width. Illustration or any picture having some important information or details on its corner will be places in a way so that it will fits within the video safe area zone.



(Fig 07) Action Safe and Title Safe Margins in Standard Definition (4:3) Display [Created by author]

Whereas, for HD videos safer area for Titles or text matter is 5% of the display size i.e. 1728 pixels in width. Similarly the Action safe margin in HD video display is recommended 3.5% of the display size. It means that important content of photos, illustrations, maps or drawing etc. will be placed in this area so the information of video will remain in safer zone which is calculated about 1786 pixels in width



(Fig 08) Action Safe and Title Safe Margins in High Definition (16:9) Display [Created by author]

Vector Graphics

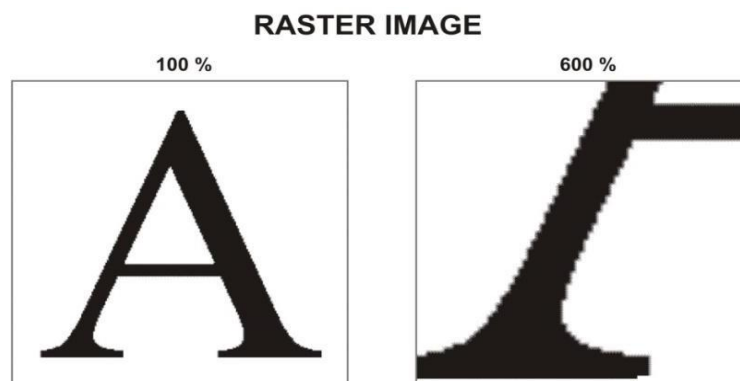
A vector graphic is the most common type of graphic that is used in making compositions. It is based on paths or stokes which lead to different control points which make up the graphic. Each one of these points has handle arms for adjustments and definitive position on the work plane. Vector graphics can be scale up or down to any size it never loses quality.



(Fig 09) [Created by author]

Raster Graphics

Pixel-based raster graphics will typically come from a bitmap image. These graphics are made up of individual colored squares (pixels) which are all assigned a specific location and color value. We have discussed Bitmap images in Unit-2 ‘Understanding Digital Images’. The amount of pixels that make up a graphic is determined by the resolution of image. It means if a bitmap graphic is scaled up or down it can lose quality.



(Fig 10) [Created by author]

Visual Effects (VFX) Design

Television industry has travelled over years. There are lots of experiments taken place since then. Now in this era when computer imagery is standing next to reality where virtual world has its own fantasy, lots of imaginary works, scientific atomic experiments, astronomical missions, space wonders, kids fairy tales and super human imagery is now can be generated in few hours. It does all can happen on your PC or workstation. During 80s when Star wars program mesmerizes us with its special effects and chroma scenes, now those effects looks

dwarf sized if we measure them with contemporary technology. We are standing on the verge of virtual world where any idea/dream can be transformed into digital imagery even it can even be printed in 3D also. Visual effect artist has the tools which can dramatically create any environment and live image of camera can be composite so perfectly that it is beyond the human eye to find the difference between virtual and real image.

Virtual World



(Fig 11): A Virtual Scene created in 3D Maya® (High Definition, 16:9) [Created by author]

Virtual world has illusionist environment, where the user can merged with 3D animated characters, or interplay with other users by using 3D characters. In sport coverage’s Broadcasters are using this technology, where one can see that anchor or commentator is standing in field and taking interview of sportsman’s. While in reality that anchors is standing in studio against Blue or Green Screen and performing live actions which appears that he is standing close to the player in ground.



(Fig 12-virtual Studio) [Created by author]



(Fig 13)



(Fig 14)

Studio (Physical)

Virtual Computer generated Set

[Created by author]

It is now very common to use graphics, animation, and special effects in television programs. Now a day's computer artist have tools to composite many informative sports score details, data charts, with live video signals. You may have seen these effects in cricket coverage, or any other sports coverage where lots of 3D information was composite with video feed for creating the visuals more dramatic and creative. Likewise in weather reports on several news channels you can observe this virtual world environment where anchor is standing against the blue/green screen and after compositing with 3D animated imagery it appears like he is standing on physical earth or somewhere in assigned unnatural space. Weather broadcasts are now more illustrative and real-time updated. Images of earth received from satellites, helps TV broadcasters to show the accurate weather conditions and estimate precipitation or any thunderous storm-forecast with its tracking visuals.

Here is a list of some digital compositing software which was used by television industry. These packages can generate images or video sequence with alpha channel, which stores the transparency information of image.

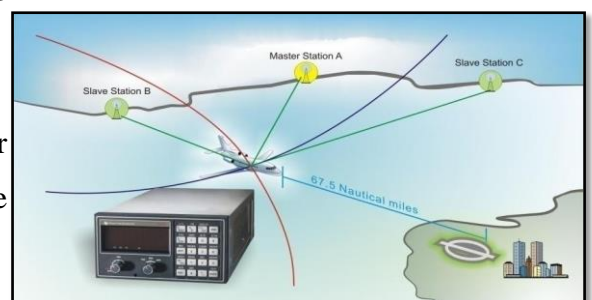
- Adobe After Effects®
- Adobe Flash®
- Apple Motion®
- Autodesk Combustion®
- Eyeon Fusion®
- Max/MSP®
- Natron®
- Nuke®

3D softwares that are used in creating 3D graphics are:

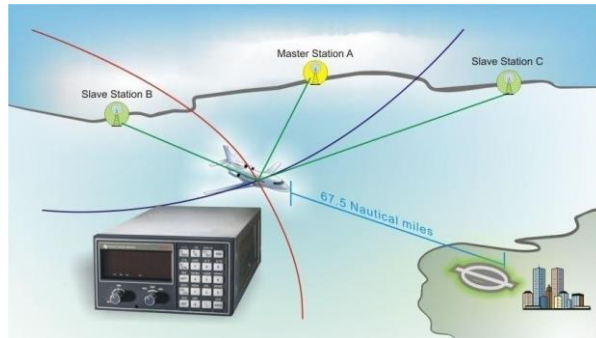
- Autodesk 3d studio max®
- Autodesk Maya®
- e-on Vue Infinite®
- Maxon Cinema 4D®
- NewTek Lightwave®
- The Blender Foundation Blender software®

Illustrations and theirUse In Graphic Designing

An Illustration is an artist's visual language for explanation of a text, process or idea. Illustrations were



frequently used as a visual since the time human learn to write and compose books. In ancient manuscripts, books or on stone carvings you can mostly see some illustrative figures were created to translate the content through visuals. ‘Illustration’ word was evolved from the word “Illumination” which means intellectual enlightenment in spiritual sense. Contemporary Illustrations can be made by using different techniques like, drawings, painting, collage, print making etc. it is depended on the requirement of subject how it can be made (Hand drawn or Computer generated)?



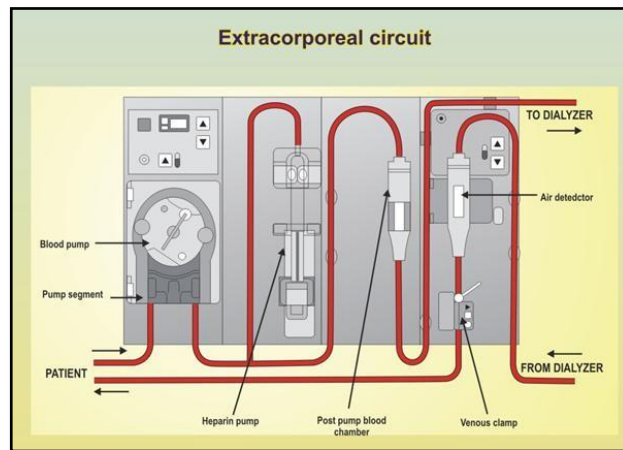
(Fig 15) : Info graphic Caption (High Definition) [Created by author]

In the television industry illustrative information is also known as “Infographics”. Graphical visual representations of informative data have quality to communicate the information quickly and clearly. Infographics are now much popular among mass communication for broadcasting statistical graphics and info data with richness of visual elements. Similarly ‘Isotypes’ are an early example of infographics for conveying information speedily to the viewers. Maps of metro, Railways, and roads, Weather statistics, stock exchange statistics, election results index charts and bars, Stacked graphs, Hierarchal charts, communication Networks layouts are some examples of infographics that are now most popular as these graphical features can communicate position, shape and color effectively. Maps are natural ways of representing geographical image and data. Using flow maps one can depict time and space. It can be good visual for weather reports, any incident happening can also be depicted initially on map till the live visual are not available for news.



(Fig 16) : Infographic Caption (Weather report) [Created by author]

Technical and scientific illustration communicates scientific nature information. Instructional Images made for scientific components, Instructional diagrams generates more effectively and convey the information via visually generated channel to your viewers. These are generally designed to explain subjects to mass audience that is not familiar to it. Or you can say non-technical viewer can easily understood the information of scientific nature. The contemporary 2D and 3D software can be used to create these illustrations in accurate form. Similarly a Medical illustration also helps the audience to learn medical anatomical and related information. Medical illustrators can visualize medical anatomy through illustrations for bio-communication by using the same tools of designing.



(Fig 17) : Infographic Caption (Scientific Component Diagram) [Created by author]

Narrative visual art is another important pictorial graphic form to tell the story through graphic visual. Here sequences of images or illustration are prepared for conveying the information to audience. Comic stories and comic strips are the example of this sequential narrative graphic literature. Here series of illustrations with expressions and gestures are drawn or created in 3D models and dialogue text was written in speech balloons. Story board can also be put in this category for pre-production of 2D or 3D animation films. Here artists and directors makes some pre- visualizing images with a series of illustrations or pictures which are helpful in communicating the shot division, sequence, costume, location and camera angles. This whole exercise bridges any communication gap.

Unit summary

In this Unit we have discussed Origin of Broadcast Graphics that issued in television production. We discussed use of Designing Elements and principles of designs for balanced composition for TV graphics. We learnt how to prepare graphics for Television and dos and don'ts regarding composing TV graphics in Title safe area and Video in Action safe margin which we left while producing computer graphics. Further we described Raster and Vector form of graphics along with compositing graphics in virtual world with the help of different compositing software.

To sum up it can be said that Graphic and Animation add interest and beauty in TV production; hence there is a need to be creative and innovative. An effective graphic has the capacity to draw the attention of viewer and generate his interest in program in other words viewer was bound to watch the program if it has interesting Materials in form of Graphics and Animated Clip. Use of latest digital tools effectively can create wonders as the graphic software is more powerful and easy to operate. The more creative you are the amazing results can come out with these tools.

Assignment

1. Create opening Title for Hindi Play 'Godaan' written by Munshi Premchand with suitable Illustration.
2. Create weather report background of 4 Indian metro cities, with minimum and maximum temperature column.
3. Compose a ticker giving 4 headlines as breaking news.

Assessment

1. What are Television Graphics?
2. Differentiate between Serif and Sans-Serif fonts.
3. Write the difference between Raster and Vector graphic image.
4. Explain the term virtual studio.
5. How VFX helps in creating virtual background?
6. Explain meaning of info graphics. How they are helpful in communication?
7. What is onion skinning?
8. Describe the usage of typography in TV production.
9. Write the frame rate for PAL video.
10. Explain the term rendering.
11. What is the use of layers in creating graphics?

Resources

1. Horak, Jan-Christopher (2014). Saul Bass: Anatomy of Film Design. The University of Kentucky Press. ISBN 0813147190.
2. Bass, Saul (1960). "Film Titles – a New Field for the Graphic Designer". *Graphis*. 16 (89).
3. Jennifer Bass and Pat Kirkham, Saul Bass: A Life in Film & Design, Laurence King Publishing, 2011, pg.263
4. Hansen, Charles D.; Johnson, Christopher R., eds. (2005). *The Visualization Handbook*. Elsevier. ISBN 978-0-12-387582-2.

Suggested video links

- (1) <https://www.youtube.com/watch?v=cNCEFZLRY0k>
- (2) <https://www.youtube.com/watch?v=xIyUEAsI3NY>

DMA-02

Digital Imaging

Block – II: Digital Imaging: Aesthetics & Artistry

Unit-1 Introduction to Digital Composition

is intended for people who want to become a Graphic

Introduction

Composition means a mixture of multiple elements together to form a meaningful output. In the Digital world, composition is done out of images, videos, graphics, sounds etc. Digital Composition creates the output in a very informative way.

We can take an example of an image where we can see an image of a showroom. In the bottom, we have a graphic rectangle with a text over it briefing about the location of the scene. In the top we have the logo of the company that has published the image. Again in the corner we have the name of the photographer or the Agency. Thus, a composition makes the output attractive as well as informative.



Source: Composition with elements, Created by Author

Digital Composition is not only about the technical process of merging two subjects. The composition has to be in process with the norms of the society. It should be ethical and should bring no harm to the content holders. The user must be aware of the copyright issues while creating a composition out of various materials from various sources. Even if a compositor mixes from various sources, he/she should acknowledge the original source.

Digital Composition of image requires the basic knowledge of Photography. For making original content, the compositor has to use all the original sources by himself/herself. The basis of an image is the Camera and the photography technique used to capture the image.

There are certain rules and principles of design which has to be adopted while designing a composition. We have to be familiar about theoretical aspect as well as some practical techniques of

making a Digital Composition. And in the final, it is about the output whether it conveys the intended resource in an efficient and effective manner.

Outcomes

Upon completion of this unit you will be able to:

- *Describe* about the Basics of Digital Imaging.
- *Explain* the Basics of Photography and the type of photography required for Digital Composition.
- *Compare* the practical techniques of Image composition
- *Evaluate* the principles and elements of Design during composition.
- *Identify* the computer software's used for Digital Composition.

Terminology

Photography: It is the process of capturing a real time image on a camera.

Digital: It is the process of storing an information in a numerical format.

Composition: It is the mixing of two or more content together to form a single element.

Camera: It is a device used to do Photography i.e. capture an image, from real time on a negative film or on digital sensor with the help of light.

Opensource software: It is a software which is free and can be openly used and distributed by anyone.

Commercial software: It is a paid software. License of Commercial software has to be purchased and is not freely distributable.

Technical Process of Digital Composition

An image is made up of pixels which consist of position and colour information. When two images blend together, it can be termed as “alpha blending”. In this case, the pixel of two images merge with each other with an opacity value called “Alpha”. The composition of colours of both the images mixes to create a new colour with the combined values.

IMAGE 1	+	IMAGE 2	=	IMAGE 3
Existing Image or file is called Background		The image which is brought in is called	Alpha blending of the pixel information	Formation of New composited image

layer		Foreground layer	of both the	
			images	

Image 1 which is existing can be termed as Background Image or Background layer. The image which is brought in can be termed as Foreground Image or Foreground layer. Then the opacity value or value of foreground image is reduced so that it does merge with the background and create a composed output. The percentage of alpha reducing is based on the visual effect choice of the creator.

Opacity value or Alpha Value	=	0	[For an opaque pixel]
Opacity value or Alpha Value	=	100	[For a fully transparent pixel]
Opacity Value or Alpha Value	=	50	[Both the images are displayed as semi-transparent image corresponding to each other.]

These calculations are in-built in the software's like Krita, Photoshop etc. It is automatically done in the process. We don't have to manually calculate anything. We have to concentrate only on the creative aspect of the image.

There are two technical methods of compositing:-

Node Based Composition

Node based Compositing is the mixing of images from two different sources. In this process, it is very effective for still frame composition. But while handling key-frame and time of real time editing it is very poor. The data's are not perfectly merged in a moving video. Some example of software's which use node based compositing are Blender, Nuke, and Fusion etc.

Layer Based Composition

In a Layer Based Compositing the image and effects are stored in individual layers. The layers are stacked one over the other as per the editing requirement and each layer has its own key-frame track. Each and every layer can be given motion individually. This is a very effective type of composition done by most of the professionals in the Industry. Some of the software's which use layer based composition are Adobe After Effects, Adobe Premiere etc.

Rule of Thirds

The "Rule of thirds" refers to one of the many rules that help a person in making a composition more attractive and more pleasing. Any composition looks better in a certain arrangement if the rules are understood well and followed properly and may not look as attractive as it ought to, if these rules are not followed.

The ‘Rule of Thirds’ is just a guide line to help make better compositions, not a hard and fast rule that cannot be broken. But good understanding of the same and following it is more likely to help one in making a composition better. The rule describes where the creator (artist) of the work should place / arrange his objects and where he should avoid placing his objects of importance.

The creator of rule of third was “John Thomas Smith” in 1797. A transcript of his rule of third in a book is shown here:

Analogous to this “ Rule of thirds ”, (if I may be allowed so to call it) I have presumed to think that, in connecting or in breaking the various lines of a picture, it would likewise be a good rule to do it, in general, by a similar scheme of proportion ; for example, in a design of landscape, to determine the *sky* at about two-thirds ; or else at about one-third, so that the material objects might occupy the other two : Again, two thirds of one element, (as of water) to one third of another element (as of land) ; and then both together to make but one third of the picture, of which the two other thirds should go for the sky and aerial perspectives— This rule would likewise apply in breaking a length of wall, or any other too great continuation of line that it may be found necessary to break by crossing or hiding it with some other object : In short, in applying this invention, generally speaking, to any other case, whether of light, shade, form, or color, I have found the ratio of about two thirds to one third, or of one to two, a much better and more harmonizing proportion, than the precise formal *half*, the

Title- Rule of Thirds

Attribution- John Thomas Smith

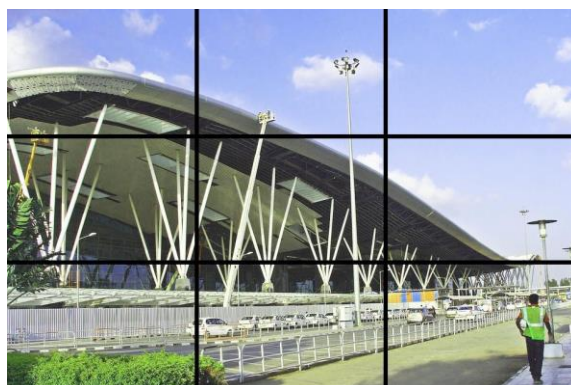
Source- Wikipedia

Link-https://en.wikipedia.org/wiki/Rule_of_thirds

In this rule a given area or block (we will call canvas), which is mostly rectangular, is divided into three equal parts both horizontally and vertically. Dividing the canvas this way produces nine blocks. The lines that are drawn to divide the canvas will intersect other lines at

Some places. Where these intersecting lines join each other they will form points that are called ‘Intersecting Points’. These points are the key points to denote the location where the most important part (main subject) of the composition is to be placed which is called ‘Centre of Interest’. Placing your centre of interest near these intersecting points helps in making a composition better and more rhythmic.

An example of a “Rule of Thirds” image is shown below:



Title- Bangalore Airport [The lines drawn as per Rule of Third by the author]

**Attribution- Sarangib (user name as per pixabay) Source-
pixabay.com**

Link-<https://pixabay.com/en/airport-bangalore-india-control-190940/>

The above rule was devised keeping in mind the field of 'Photography' but the same rule can also be successfully applied to any design so that it would look better and more pleasing to the eyes.

Generation of Images through Photography and Computer Graphics

Composition is done from the Photographs and Images which are generated from photography and Computer Generated Graphics which may be a slide of data/graphs etc. or a 2D or 3D generated graphics. Hand drawn and hand painted subjects can also be inputted for Compositing.

Photography is done with cameras and the quality of the image depends upon the photographer, the quality of camera and the lighting of the scene. The photographer should understand the needs of the subject he/she is capturing to get the picture needed for creating final output. He/she should also understand the theme of the photograph i.e. whether it is a personal portfolio photography or a photo for an advertisement, hoarding or a banner. The photographer chooses the camera and camera settings as per the size of the output required for final composition.

The source of images for digital composition with example is as follows:

- Images acquired through the medium of Photography
- Text Styles from Computer Graphics software
- Designs from vector based Computer Graphics software
- Scanning from documents using scanner.

Elements of a Digital Composition

Lighting

When we plan composite images, the source of the images has to be shot in with the same lighting pattern. There are occasions when the first photo is shot in the morning and the second photo which is required to be taken is shot in the afternoon. If we merge these two images directly then the output will not look natural. It is very frustrating situation for compositor who has to first match the light settings manually using Computer graphics software. It is a trial and error method where variety of combination of options has to be tried by the compositor.

Here, we have two images that need to be merged but the lighting of both the shots are different.



Title- Lighting

Source-Pixabay Link-

https://pixabay.com/get/eb36b40e29f2043ed1534705fb0938c9bd22ffd41cb0154992f8c372351165_1920.jpg

[ca6/sunny-morning-](https://pixabay.com/get/ca6/sunny-morning-)



Title- Lighting **Source-**

Pixabay Link-

https://pixabay.com/get/eb35b10d2ef0023ed1534705fb0938c9bd22ffd41cb015499df0c57fa0/kot-2002643_1920.jpg

Hence, a pre-production work has to be check listed before planning for a compositing work in terms of lighting.

Final Output

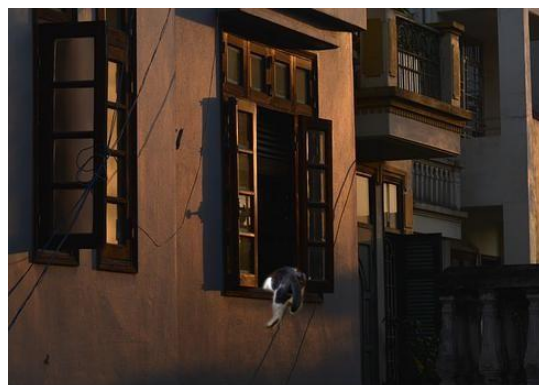


Image: Combination of the two base images matching the light settings Created by Author

Lighting is very crucial when we are doing blue screen shots or green screen shots. The

source shot lighting should match with the destination shots. There are lots of properties of light settings like – intensity of the light, colour of the light and distance of the light. The positioning of light has to be perfectly done.

Lighting is in total a completely individual art work. It is handled by professionals in the Industry. It is very difficult for a new comer to set lights with only theoretical knowledge. If not done properly, it will show blue or green spills during the compositing which will make the output nasty. There are various methods of reducing the spills. One of them is to focus some yellow light on the subject to decompress the blue colour. Various colours of lights have to be used according to the requirement of final scene.

Camera Technicality Match

This is a very important phenomenon of composition. The two merging images will look perfect only when the camera angles of both the images match perfectly. If you have taken a photo of scenery from top angle and you want to merge your image into another picture, you should take your shot for the second image too from the top angle only to match the composition.

There are options in Computer graphic software to change the scale of the shot but a different camera angle of two shots is very difficult to merge.

Now-a-days, there are techniques where a camera motion is controlled by computers. Shots which are used for double role are shot using computer controllers which help in perfect merging. We can see the perfect composition in the movies where we find actors doing double roles.

Identical source of acquiring Images

It is better to take the photograph of two scenes to be combined using the same source i.e. camera, or scanner etc. The same source is important for a perfect composition because the same settings in different brand of cameras generate different results. Technically the settings may be same, but the hardware quality varies from company to company. In case of films, people tend to use single type of camera for shooting the entire film to maintain perfect compositing.

Information Assessment

This can well be called a Pre-production job. When we go for shooting images for composition purpose we have to make good notes and prepare a check list of all the requirements for the shoot.

An example of elements in a check list is as follows:

- Lights of different varieties
- Camera lens
- Camera battery [Additional battery for backup]
- Tapes for measurement of distance from camera position and model position.
- Colour combination of background, dress of the model, colour of the props in the scene etc.

All these information beforehand will enable in functioning of smooth shooting of raw materials for composition in later stage.

Fixing or Manipulation

There are occasions when after all the shooting and acquiring the raw image the shoots are done in digital format, we come to know that there are some settings which are wrongly done for which the shots of some area are not perfect and it has to be shot again. Now it is no more possible to shoot again due to various reasons.

In such cases there is no alternate except to fix the issues using Digital Computer Graphics software. This is called fixing or manipulating the original material to match the required output. In some cases, it is easily done and in some others, it is extremely time taking and difficult. It takes not only the technical knowledge but also the creative idea of the compositor to fix the issue.

Rotoscoping

Rotoscoping is the process of removing the unwanted areas of a frame for compositing. It is done by professionals where they remove unwanted areas which cannot be easily removed by green screen or blue screen areas. In one second we have twenty five frames; that means that if a rotoscope artist has 30 seconds of a shot he/she has to clean (30 x 25) 750 frames which is a very time consuming job.

Here is an example where we use rotoscoping to separate the character from the background.



Title- Compositing

Source- Pixabay Link <https://pixabay.com/en/windmill-river-scenary-water-sky-916637/>
<https://pixabay.com/en/people-man-model-glasses-516372/>

Here the artist has to work very minutely over the edge areas because it is the place where it merges with the background area.

Merged Image



Created by Author

In the above, the character has been selected individually using the Roto process and then pasted in the background.

Wire Removal

The extreme Action sequences and dance sequences are done using wires ties to the actor/actress. Here the frame is imported into computer and the CG artist removes the wire frame by frame. This job is of similar category of Rotoscoping job. This also takes lots of time and artist has to merge the background too along with the removal of the wire.



Title-Wire removal

Source-Own Photography with original source.

This practice is very common in visual effects in films where lots of mechanical devices are used to create an effect and thereafter removed using Computer Graphics. The person doing the wire removal has to be very skilful and work of every frame has to be done perfectly else there will be flickering and jerk in the output. There are some cases in which wire frames are easily removed but in some cases the wire areas have to be manually painted through software brushes.

Hand Painting

Hand painting is used to create exotic background effects which cannot be shot through a camera. Fancy elements like starburst, extensive glow effects etc. are done using computer graphic software's like Krita, Photoshop etc. Hand Painting doesn't mean only the hand drawn paintings, it is the digital painting done using Computer Software's.

Clone Stamp

Clone stamp is the method to remove unwanted spots or elements in a frame. There are occasions where we get elements in a shot we don't require. For example, in a shot we have two crows sitting on a rock in the background. We want to remove one crow only from the shot. This is done using Clone stamp tools which is available in all the computer graphic software's.

Title-Clone Stamp

Source-pixabay.com

Link-<https://pixabay.com/en/birds-crow-black-433965/>



Output after cleaning using Clone Stamp



Title: Image after applying Clone stamp

Spots on the face of actor/actress can also be removed using Clone stamp. This has given the director the freedom to add or remove elements even at a later stage. This was not available in olden days where things were not done digitally. In olden days, things were done using optical techniques where a portion of a frame was very difficult to be edited.

Filters

Filters are the effects which are added after compositing to make the image more effective. Some of the commonly used filters are Blur, Noise reduction etc. Blur is used in background areas where we need to focus on the foreground image only. We have seen in movies where the background is automatically blurred and the character is focussed using camera techniques.

In some cases of night shots, we get grains on the shot which distracts the image. It can be reduced or removed using filters like Noise reduction. There are many other filters also which effectively work towards a best composition.

Artificial Lighting

Artificial lighting is also an in-built feature of Digital Composing software's like Krita, Photoshop etc. Unique type of lighting can be used on specific areas of composition to make the scene more realistic. They are termed as lens flare, Omni light, spotlight, and illumination lights etc. in technical software terms.

Shadows

When merging two elements, shadows are not always merged. The compositor has to manually add shadows of the subject to add depth to the image. Shadow is a very important element and it has to be created professionally taking into view all the properties of a shadow according to the lighting.

Properties of shadows include its opacity/alpha/transparency, the height of the shadow, overlapping cuts on other elements etc. A perfect shadow will make the composition look very real and impressive. Computer Graphics provide the tools and techniques which help the compositor to tweak shadows as per requirement.

Atmosphere

For making a composited scene real, lots of atmosphere effects like fog, haze, smoke, fire etc. are added. While adding atmosphere effects, the compositor has to have an idea of depth and distance of the scene. The effects should look natural hence lots of reference elements or reference photographs are studied in detail. After studying the reference, the techniques of software tool is used to apply Atmospheric effects

Printing Techniques of a Digital Composition

Symmetry

Using symmetry in a composition or image creates an amazing view. It creates an attraction at the symmetrical point. An image below demonstrates the symmetry in an image composition.



Title-Symmetry Source-pixabay.com

Link-<https://pixabay.com/en/bridge-feet-symmetry-bridge-urban-2114052/>

Another example of symmetry is the reflection of a subject in water or mirror. This also generates a wonderful composition.



Title-Symmetry Source-pixabay.com

Link-<https://pixabay.com/en/castle-park-mirroring-mirrored-1998437/>

In symmetrical compositions, it is better to add the highlighted subject in the centre of the frame.

Frame within a Frame

There are compositions in which a scene is seen through a door or a window which consists like a frame. This will give a more focus to the subject of the composition. The image below shows a sea view through the window. This creates a focus on the output area.



Title-Frame within frame

Source-pixabay.com

Link-<https://pixabay.com/en/view-window-sea-view-tenerife-2417156/>

Leading Lines

Image Composition of pathways leading to a destination catch the eye balls of the audience. The lines need not be straight always. A curved pathway also does the same leading work. There are examples of flowing waters, moving cars on a road etc. which leads the photo to a destination.



Title-Frame within frame **Attribution-**

Thomas Alter Source-pixabay.com

Link-<https://pixabay.com/en/road-town-paved-old-town-949832/>

Diagonal Representation of Images

The representation of images can be divided into shapes. Some shapes automatically

appear during a perspective shot of building, a bird's eye view of a mountain etc. So always try to make composition in triangles forming diagonal lines.



Title-Diagonal representation of Image

Source-pixabay.com

Link-<https://pixabay.com/en/ely-cathedral-colossal-church-414090/>

Patterned Images & Use of Textures

Patterned flooring and walls are done to create attraction. It gives depth as well as a message for remembering a spot due to its resemblance of continuous pattern. Differentiated patterns make the scene memorable as well as beautiful.



Title-Patterned Image

Source-pixabay.com

Link-<https://pixabay.com/en/tile-pavement-road-city-831527/>

Textures also come in large variety like wooden textures, granite flooring textures, marble flooring textures, colourful square textures, parking textures etc. These textures add depth and artificial realism to a place. For example, a wooden texture would give the feeling of a tree or scenery in an interior.

Rules of Odds and Evens

In composition, odd number of elements creates more attraction than even numbers. For example, five birds sitting on a branch will be more effective two.

Image: Nine Birds sitting on an electric wire



Title-Rules of odds and evens

Source-pixabay.com

Link-<https://pixabay.com/en/birds-swallows-lines-sit-427909/>

This rule is followed by professionals but not considered by all. There are occasion where even number of elements are required compulsorily. For example, two people are talking, in this case a third character can become a distraction. Hence, it depends upon situation where we need the odds and where the evens.

Filling the Frame

In a composition, the main element has to be focussed and fit in the frame. In case of a face of an animal photo we have cropped it till its face even eliminating the outer border. This helps in focussing on the face of the animal.



Title-Filling the frame

Source-pixabay.com

Link-<https://pixabay.com/en/africa-african-animal-cat-close-up-17335/>

In this building, a little space has to be left to show the surrounding of the building but to some extent only. So the compositor has to decide according to the subject on how to fill and fit the frame with the content.



Title-Filling the frame

Source-pixabay.com

Link-<https://pixabay.com/en/scania-sweden-lighthouse-sea-ocean-123782/>

Leaving Negative Space

In some cases, there are lots of negative spaces or blank spaces that have to be left to focus on the character or subject. We can see in full page advertisements where around 50 to 60 percent of space is used in negative and only 40 percent is used for the content. This creates a pin point view to the audience who concentrate only on the main subject for the whole time they look into the image. This will not put pressure on them at a glance to view at all the materials in the space.



Title-Leaving Negative space

Source-pixabay.com

Link-<https://pixabay.com/en/curriculum-vitae-cover-letter-1756264/>

Simplicity by isolating the subject

Simplicity means to focus only on one segment. This is done by blurring the background elements and focussing on the main subject. This is done in composition by using multiple layers. The content in the Background layer which is sharp can be blurred artificially using the Blur filter of the computer software. In Photo of sceneries also we can find blurred background with fog effect and focussing on the mountains and trees. This can also be referred to as isolating the main subject from the other matters of composition. Isolation means left alone to be focussed rather than being a part of the crowd.

Image: Car with a blurred background



Title-Car with background

Source-pixabay.com

Link-<https://pixabay.com/en/capri-ford-oldtimer-automotive-790722/>

Point of View

The subject for composition is taken from different point of view or can be simply termed as taking photography from different camera angles. The subject for composition depends on the interpretation of the subject. If we are taking a photo for composition of a character or model it has to be taken from eye level or from a bottom angle. If we have to take a photo for composition of scenery then wide angles are used from bottom to top as required.

Colour Combination

Colour combination is a very important factor in composition. The artist can use variety of colours which goes in contrast with the images used in the composition. The light shades of a particular colour from dark to bright bring a depth or 3D effect in the composition. While composing a colour for depth it takes the dark shade of the colour to display distance and the bright shade to display glossiness and light. The logical arrangement of a colour sequence helps in choosing the right colours.



Title-Color combination

Source-pixabay.com

Link-<https://pixabay.com/en/color-district-colorful-pattern-455365/>

Rule of left to right

We always read text from left to right; hence we have the same pattern in images also to look at it from a left to right perspective. So the flow of information or movement in any composition has to be displayed from left to right. For example, if you want to show a photograph in which a person is walking to destination, then it has to be shown as the person is walking from left to right towards his destination.



Title-Rule of Left to Right

Source-pixabay.com

Link-<https://pixabay.com/en/walking-girl-female-young-people-591202/>

Although in Arabic countries, text are read from right to left. So there is possibility that images may be in those countries may be composed with the opposite rule.

Balancing Elements in a Composition

Balancing elements means the arrangement of focused parts of composition. For example, in an advertisement one wants to focus on 50% discount first, then the focus on the product, then on the features of the product, then on the contact information.

This balance is created by the sizing of the elements in some places and by colour specifications in another. The composition of dark background with a bright text brings the subject in focus, whereas a semi dark background with a semi bright text solves the purpose of giving information but it is not highlighted as equal to the main subject. A successful compositor is one who masters the art of balancing the elements in Digital composition in computer software.

Unit summary

In this unit you learned about the Digital Composition elements which make the composition a successful output. You have also learnt about the role of Computer Graphic software in each and every element of Digital Composition. In today's graphic world all the composition has to be done using Computer Graphics only.

Assessments

- Name two software's used for Digital Composition.
- Name five elements used in Digital Composition.
- Name the person who established the Rule of Third.
- In the year _____, the Rule of third was established.
- Name the two technical methods of compositing.

Resources

Digital Composition

https://en.wikipedia.org/wiki/Digital_compositing **Digital Composition and Digital**

Literacy <http://guides.library.stonybrook.edu/digital-storytelling> **Digital**

Composition and Performance

<https://www.eca.ed.ac.uk/study/postgraduate/digital-composition-and-performance-msc>

Unit 2 Use of Digital Elements in Digital Layouts

Introduction

A good design always comes with some common elements. It is because of the use of these elements in perfect way; an output of a design is appreciated and fulfils the motive of the designer to convey the information. Conveying information to the user is the most essential part of creating a design using visual elements.

There are around twenty numbers of elements of design. The number of elements is not fixed. It depends upon the choice of the designer to use the combination of elements. It is not required that you use all the elements of design in a single project. The fundamentals of Design elements are taught in the school of art as the basic foundation. It is upon this foundation that the style of the work of artist depends. If the foundation is good and clear, then the artist can go on to become a good asset as a Visual Communication candidate to any organisation. The process of learning Design elements is possible only through visual demonstration of each and every element.

Outcomes

Upon completion of this unit you will be able to:

- *Describe* the Design Elements of Digital Layouts.
- *Interpret* the use of major Design Elements.
- *Examine* the combination of best components for design.
- *Apply* the Design Elements in Practical works.
- *Draw* the elements through graphical representation of each element.

Terminology

Design: A representation of a subject in a stylized manner.

Visual: Any subject which can be seen using eyes.

Elements: The components out of which a subject is made up of.

Texture: An image which is applied on a subject to show its originality and create the feel. For example, a brick texture on a flat box.

A Brief History of Designing

Design Elements

The elements of design are used according to the requirement of subject. The most commonly used Elements of Design are as follows:

1. Line	6. Symmetry	11. Contrast	16. Rules
2. Scale	7. Transparency	12. Framing	17. Movement
3. Colour	8. Texture	13. Grid	18. Depth
4. Shape	9. Balance	14. Randomness	19. Typography
5. Negative Space	10. Hierarchy	15. Repetition	20. Composition

Now, we will study each and every element in detail.

Line



Fig. 1: Different styles which can be applied to Lines [Created by the Author]

Line is the first and foremost element of Design. Everything we look upon is made of line. It may be the numbers, alphabets, drawing etc. everything is made up of Lines in one form or the other. Line always does not necessarily mean a straight one. The curved forms of a drawing are also considered as a line. If we need to show something to the point of the subject only, then a straight line is used. When we want to show something which gives movement to the information, then curvy lines are used. If we need to show something new and innovative with suspense then patterned lines are used.

Line gives direction to our eyes to generate emphasis on the subject according to the arrangement of the design.

When we give an artist a pencil to learn art then what does he do. He just draws lines and composes them to create a final version of the drawing. In the same way in design, Line tool and Pen Tool in graphic software play a big role in creating a good Computerised Graphic design. It is easy to draw straight and curve lines using software's with accuracy. Even if we make mistakes, there are options to rectify it with ease.

Scale

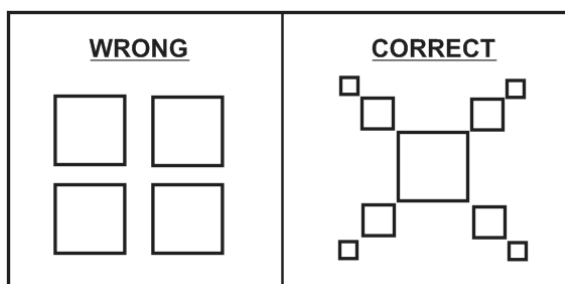


Fig. 2: A comparison of a wrong and correct form of scaling [Created by the Author]

Scale classifies the importance of the subject according to its requirement. It means that the headings are a bit bigger in size and bold than the normal text. This distinguishes between the important points of the design and the ordinary information of the design.

When we look at an advertisement, we always see the information which is larger in the size and then move our eyes towards the smaller size information. For example in a product advertisement “50% Discount” is sometimes highlighted in big and then the product information follows. So Scale is a very important element in design because in today’s busy life, people have less time. People looks at things in glance and only when there is a thing of appeal in larger size, it attracts the person. It is only after the attraction that they get into the detail if they are interested.

Scale is not always used as per subjects appear in real. Lots of variations are used to create attraction. We have seen cartoon characters with a big face and a small body which is not real but looks attractive. So use of artificial scale is done according to the requirement of the subject. A viewer has to comfortably establish the important subject in the design according to the scale.

Colour

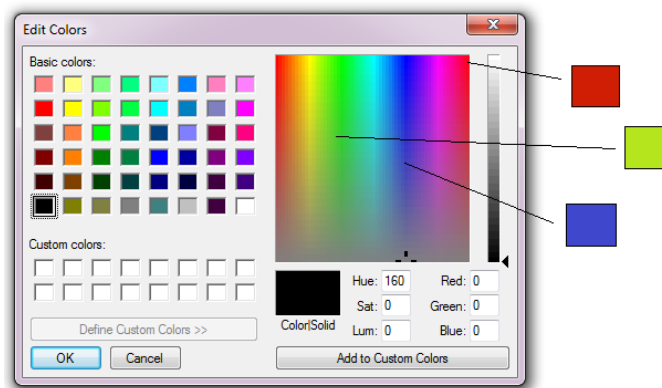


Fig. 3: A graph consisting of all colours on Computer Graphic Software

[Composition by the Author]

Colour is an essential part of design today. It plays a very vital role in design to catch the attraction of the audience. The above figures indicate the colours which can be used in Computer Graphics. Each colour has been given its own resemblance and is used according to the feel of watching a colour. Some of the commonly used colour implications are as follows:

Colour	Implication
Red	Red colour is used to show Passion and Excitement which fill our mind with energy and confidence.

Orange	Orange is a fresh colour which is used as a symbol of adventure. If you are willing to try something new in a business, the use of Orange will create strong enthusiasm.
Yellow	Yellow colour is cheerful and light colour. It is a symbol of the colour of the sun when it shines. But due to its extra glossiness it may look cheap if not used with the perfect combination. So try to avoid yellow as a single colour medium.
Green	Green colour is the symbol of tree which gives a natural feeling. Depending upon the product category, green is used which connects us with the outer greenery.
Blue	Blue colour symbolises sky, ocean etc. It is a vast colour which is used for communication. It easily connects with the harmony of the viewer. It is used as a cool colour in design.
Purple	Purple is a royal colour and is mostly used in luxurious brands.
Brown	Brown is a bold colour which adds strength to the design just like a branch to the tree. It is mostly used in organic products.
Pink	Pink symbolises romantic and sentimental feelings.
Black	Black is used for communication purpose and sometimes as the background highlighter over a light colour like white, yellow etc.
White	White colour symbolises space and in any design fifty to sixty percent is left as blank space as an element of design.

Shape

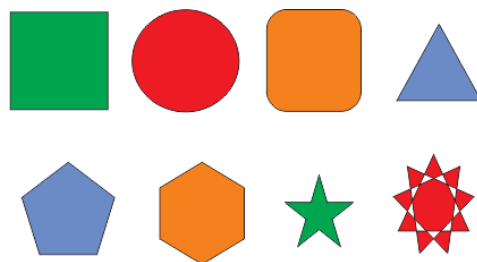


Fig. 4: Varieties of Shapes [Created by the Author]

Shapes play a big role in forming of design. Triangle, Rectangle, square, oval, circle, star, polygons etc. are used in designs to create the output. There are two kinds of shapes. One is mechanical shape and the other is organic shape.

Mechanical shapes are those which are formed of measurement like Rectangle with its length and width, Circle with its radius, Polygon with specific number of sides with radius.

Organic shapes are free hand drawing shapes which are done using Pen tool, Bezier tool etc. It is formed in a specified space according to the rough estimated proportion. It depends upon the artistic ability of the designer to make the shape attractive.

Negative Space



Fig. 5: Image displaying the unused space as negative space to form a design [Created by the Author]

Negative space is the space left over after creating our designs. But this space can also be used in an effective way to create a symbol. In Fig. 5, we can see the white space as the negative space. But if we subtract black from it we get a design from the outline of the white shape. This has not been created intentionally by the user by it automatically happened.

Negative spaces are used in patterns and tiles also. The left over shape is automatically formed. It looks like a loop where every part can be considered as the starting point of the subject.

It is also created in small shape designs like logo where we need to represent more using less design.

Symmetry



Fig. 6: A symmetrical figure where the left side is the mirror of the right side. [Created by the Author]

A human shape is made up of symmetry. Symmetry means the left side and right side are similar to each other facing the opposite direction. Images which form symmetry attract the most. From an advertising point of view, we can see designs and background photographs which are drawn or photographed from symmetry point of view.

Symmetry is basically used in symbols and logo forms. Although each designer has his own choice of representation, symmetry acts as an asset for the designer. Symmetry is used in cases of mirrored images, reflections on water etc.

It is not necessary to create the whole image in symmetry. A part of a scene can be also

shown in symmetry which adds an essence to the viewer.

Transparency

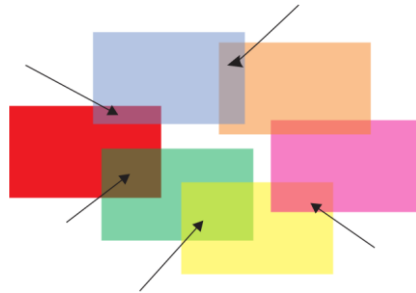


Fig. 7: The intersected area displaying transparency of overlaying objects with alpha/opacity applied on it.

[Created by the Author]

In the language of Computer Graphics, Transparency is termed as Opacity and in some cases as Alpha. In case of Raster Graphics software, a shape or an image is placed in layers and the opacity of the layer is reduced to see the transparent parts of the lower layer. In case of Vector Graphics Software, the shape itself is considered as a layer and the opacity is reduced as property of the individual shape.

Opacity is used mostly in Compositing of images where we would like to merge one image over the other and be able to see both the images with reduced transparency of both.

Transparent medium of design is being experimented on glass paintings also. This element is not only limited to computer graphics. In hard copy of design also transparency is tried to be implemented in form of glass, transparent sheets etc.

Texture

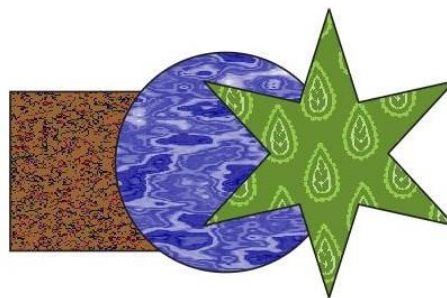


Fig. 8: Varieties of Textures inserted inside the shapes [Created by the Author]

Textures are used for creating a 3D feel of a photograph when we look at it. For example when we look at the texture of branch of a tree, we feel the depth of touching the tree. In the same way there are lots of textures like brick texture, stone texture, marble texture, fabric texture for clothing etc.

When we create something artificially using Computer graphics, it is formed in outlines or flat and gradient colours. With the help of textures we can apply it in shapes to make it look real. It creates an illusion of depth in the minds of the viewer.

It is not merely used a design, but it is used with intention to create the feel of the subject of the design. It is a source of tactility to the design to create incredible effects on the screen. It creates the vintage feel to the viewer while watching the dark and light strokes which is created by the designer. Watching as a source of information and feeling it as natural connects the mind of the viewer with the potential source of information.

Balance

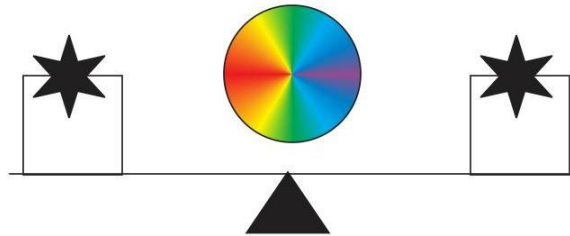


Fig. 9: Equal balance of subjects in both the directions [Created by the Author]

Balance is the placement of the elements of your design in an even way that it looks informative from all the angles. For example, we have created a design and put most of the elements in the left side then there will be a problem for the viewer standing in the opposite direction to watch it.

Hence we have to see that both of sides of the design contain equal elements of importance even if it is negative space. It is like the weight of elements placed on either side of a measuring bar. Both the sides need not be fully symmetrical with identical contents but the information of value should be equal in both directions.

Hierarchy

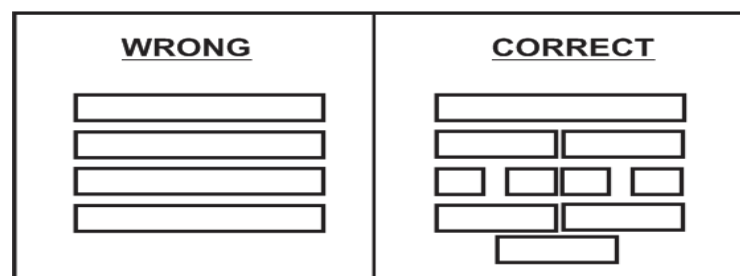


Fig. 10: Positioning of elements according to importance under a hierarchy chain [Created by the Author]

Our world runs on Hierarchy, both from top to bottom as well as in parallel. It may be family or business, authority runs on hierarchy. Hence while designing something we have to create the hierarchy. We should be clear that which information has to be highlighted first and then the next. It is not only in scale that hierarchy can be shown. Hierarchy is also shown using colours.

With the help of scale and colours the designer has to create the hierarchy of information. A perfect hierarchy give significant importance to the elements of the design.

Contrast



Fig. 11: A contrast variation among the colours from dark to light [Created by the Author]

Contrast is used for highlighting a subject or to make an object look like popping out of the screen. It is basically done where we place a white text over a completely black colour. It looks like the white colour comes forward of the black creating a depth or a 3d kind of look. Contrast is used to create artificial depth to an object. Although the object is not in 3D but it creates an illusion of front and back in space.

Technically contrast is created in different ways like using Bright Colour against Dark Colour together, Thick shapes against Thin Shape together, large shapes against small shapes together. When we place two opposite things in front of each other or besides each other it creates a 3D kind of effect which indicates depth to the design.

Framing

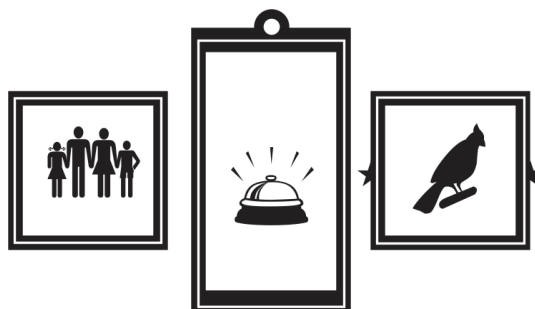


Fig. 12: Framing of subjects to create importance [Created by the Author]

Framing in a design is created to draw attention towards a particular subject. The frame may be in form of an outline in any shape such as rectangle, oval etc. It gives emphasis to the subject which is placed inside the frame.

It creates an aesthetical composition of the subject and the frame. There are occasions when the highlighted subject is just information but not an attractive design. In this case the subject is intentionally highlighted through a frame.

The frame also removes the unwanted part of a subject or an image which is done using Cropping. It is also termed as Masking in Computer Graphic language. In Masking, a shape is created in any form and an image or another shape is placed inside the mask. Frames need not be a specific shape; it can be designed from simple to exotic floral designs.

Grid

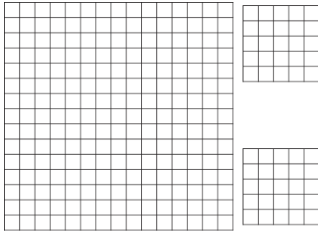


Fig. 13: A Graph composition of Grid [Created by the Author]

Grid takes us back to our olden days of Graph Paper in the subject of Mathematics in school. It is used to prepare Graphs, Charts etc. using perfect measurement. In Computer Graphics Grids are used to create elements with perfect alignment. The placement of elements of a design is very important. It has to appear in a perfect way. For example, we use scale to draw a straight line on a paper. In the same way Grid is used to place things in proper place and proportion.

A single grid is used in different ways. Sometimes it is used to generate objects by perfect measurement. It is used to create alignments of objects according to their measure for i.e. left, centre, right, top, vertical centre, and bottom, justify etc.

Grids are used as a helpful tool in a design which appears only on the screen. Grids do not appear in printout. It is like an on and off option in a software. When required it is turned on and when the use the over it is turned off. The spacing of grid can be specified by the user according to his need.

It makes the design neat and clean, look good and impressive to the viewer.

Randomness



Fig. 14: Rough Positioning of subject creating Randomness [Created by the Author]

Randomness is used in Design for Abstract form of artwork. There are occasions of designs where non uniform works attract. It is a composition of subject which are placed and aligned in an abstract manner. It deviates all the elements of design still looks impressive. These are used in designs which are used to convey information that are not of high commercial value. These are used in Art works.

Randomness is termed as Design Randomness when used in design works. Even though things are placed in rough order, design randomness still creates a message out of it. It helps in a smooth eye flow on the hidden elements in a random design. It is like searching for a valuable among the scraps. Everyone might have done this in their life at least for once. We get a chance

to get into a store room locked for months. We would try to find something useful from the useless things and feel proud when we find a one of our relevant importance.

In the same way Randomness in design is also a genre of work in which a category of people are interested. It may be for film, art, design etc. People visualise abstract form like making an imaginative picture out of the formation of clouds in the sky.

Repetition

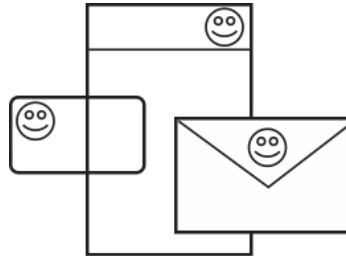


Fig. 15: Repetition of a single element like logo in all the correspondence document of a company
[Created by the Author]

Repetition is a useful element to build the brand of an organisation. People quickly remember symbols and logos rather than the name of the company. So we can see logos of various companies like Tata, Coca Cola, and MDH etc. They have a unique symbol which is repeated on all its products from packaging to letter heads, visiting cards etc. A consistent view of the logos creates the brand of the organisation in a large scale. Logos and Trademarks are done by professionals looking into all the aspects of the company because this is the symbol which will represent its identity for all the future days to come.

Repetition is also used to create emphasis on a design. It is also being termed as Tiling or Patterns. In this case a single design is repeated all through a shape to create a textured effect. The design which has to be repeated should be in continuous flow then only a tile effect is created. If the design is broken or creates a patch while repetition then it is a wrong pattern. Hence, while drawing a pattern one has to be very cautious in the corners because the pattern connectsthem from the four corners i.e. top, bottom, left and right.

Rules

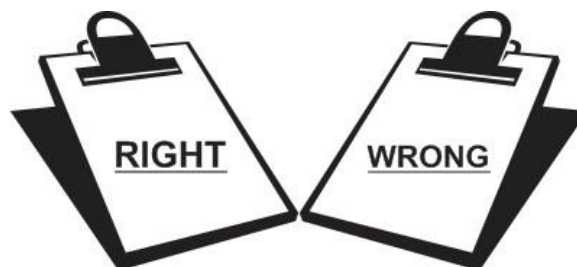


Fig. 16: A rule sheet of right and wrong in Design [Created by the Author]

Even though there are some logics of design, a designer denies following certain rules. In some cases, a designer does not even want to have an eye on any of rules while designing a piece of work. Rules exist in design which creates a checklist of what is right and what is wrong.

Following the rules create a design of perfect nature. It tells us what should be done and what should not be done. It is not described by aliens. It is done by the people who have contributed their years of experience in the field of design. These are the basic common rules which are correct to the maximum extent. There are rules like using a particular font, not using pixelated images, cutting an image sharply from the edges without leaving any cut marks or background colours etc.

So there are designers who follow the rules as well as the designers who feel pride in breaking the rules and arguing with the justification of their deeds. This has been going on and will go on till designers exist.

Movement

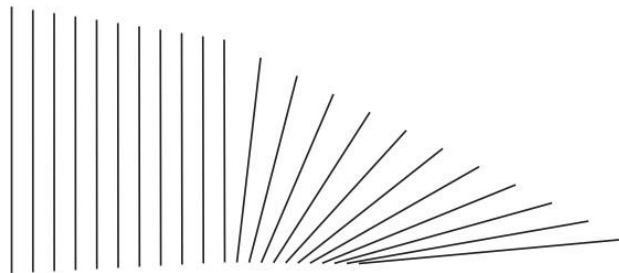


Fig. 17: Movement of a subject in a pace [Created by the Author]

When we hear of movement in a design or still graphic, we might imagine that how can we give a movement to a static image. But still movement is an important element of design. Movement is the flow of information which you want to convey in the design. For example, when we see a design, we see the focussed part of the design then move onwards to the other parts of information.

Movement can be shown on the still graphic by symbols, arrow marks, transparency flow of an object, scale hierarchy of an object etc. It creates a sense of happening in the image. Movement is also achieved through filter effects like Blur. It is also illustrated through motion lines like smoke effect in the backside of a vehicle, circular lines around the legs of a person etc.

Depth

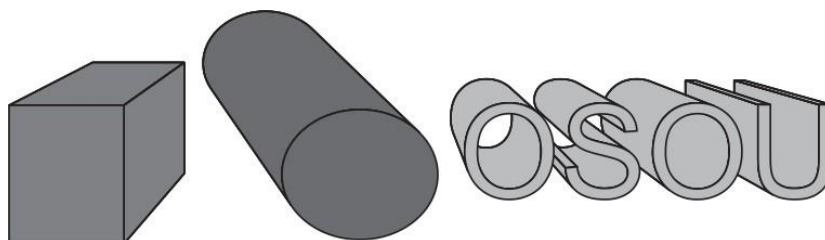


Fig. 18: Adding depth to a shape and a text [Created by the Author]

Anything which has depth captures the attention rather than a flat image of the same subject. It is the artwork which generates a 3D visualisation on the flat surface itself. It is done using various techniques:

- Adding Shadows – The oldest and easiest technique of creating a solid feel of an object is to add shadow to it. It makes the object lively in the scene even if it is seen from a two dimensional view. The shadow is given a treatment like black faded colour with transparency. It is tweaked using shape manipulating techniques like Distort, Free Transform, and Skew etc.
- Light and Deep shade of a colour – A depth to an object is formed by creating a gradient shade from the light colour to its dark shade. It is the efficient method of creating 3D using gradients in all the raster and vector based two dimensional software’s like Krita, Inkscape, Photoshop, CorelDRAW etc.
- Perspective – Depth is generated from the Perspective drawing. Drawing in perspective is an art which has to be learnt in Art subjects. Drawing roads, buildings etc. are a part of perspective drawing study. Drawing in perfect proportion in perspective will make the scene lively by adding depth in form of distance.
- 3D effect like Extrude, Revolve etc. – There is readymade effects like Extrude, Revolve etc. in software which automatically creates depth to the subject in various forms and colour.

Typography



Fig. 19: Different styles of writing a text [Created by the Author]

The style of writing an alphabet is called Typography. There are thousands of typographical designs available as readymade in the industry. Typography according to Computer Terms is referred to as Fonts. There are lots of in-built fonts which come with the Software operating system. A user need not be a good artist in writing or may have a bad handwriting. But when he uses a computer to write something, he can choose the best font available and make the writing good excellent.

It is the choice of the font which a designer chooses according to his creativity which makes him outstanding in the text design. This is really a boon for the designer as in the old days without computer; an artist has to manually write the text with lots of technical equipment of art like scale, rounder, eraser, ink, paint etc.

So Typography is only a choice for the designer without worrying about the process of writing a text. Even though there are some designers who create their own style of text using the shape tools of the software’s.

Composition

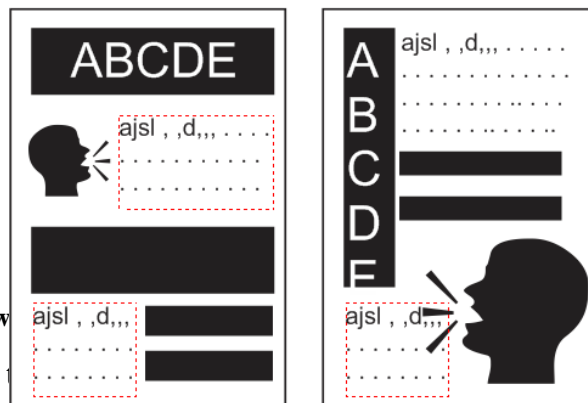


Fig. 20: Tw

thor]

The last but not 1. Even though you have everything, if it is not composed or presented in a systematic way then all the hard work goes in vain.

Hence a designer has to compose his work according to the elements of design. Composition is an interesting work to do if you have all the objects needed for the design. It can also be termed as Editing of the subject.

It is a creative work and each designer has his individual taste and choice of composing an artwork. A single subject with the same matter is displayed by different designers in a different way. There is no rule of $4+5=9$ here, any combination to form 9 is correct such as $1+8$, $2+7$, $3+6$ etc.

Unit Summary

In this unit you learned about the elements of Design which are used for preparing Design works. You have learnt about the principles of design which will be helpful when you will be given a design project. It not only gives a direction to the work but also makes the work look efficient. In old days people used rough guesses which creates a design. It is only after a detailed study the elements of a successful design has been collected and given to learners making their foot into this great world of design.

So, this checklist of elements of design will always accompany you in your mind and help you to eliminate the mistakes which making a design. The vision of a customer can easily judge the work, so after completing each and every project in form of a design, film etc. it has to be showcased to a set of viewers to judge the work. So, whenever you make a design, don't judge it by yourself. Take consultancy from reputed people or even from your friends, elders or even juniors. The consumer feedback will help to know the mistakes done with the elements. After knowing the drawbacks you can rectify the changes and the final output will be a perfect design.

Assessment

- Name the twenty elements of Design

- Create an own graphical representation of the twenty elements of design in a pen and paper.
- Name the elements which you find more interesting and why?

Resources

Elements of Design : https://en.wikipedia.org/wiki/Visual_design_elements_and_principles

Ten Basic Elements of Design <https://creativemarket.com/blog/10-basic-elements-of-design> **Design**

Elements and Principles <https://designschool.canva.com/design-elements-principles/> **Introduction to**

Elements of Design <http://char.txa.cornell.edu/language/element/element.htm>

Unit 3 Basics of Image Editing

Introduction

Digital Industry is progressing very fast. The varieties of input into digital platform are increasing in form of Scanners, Digital Camera's, Mobile Cameras etc. Text has most probably been replaced by Images and Photographs. With the advancement of 3G and 4G network, now it is possible to easily transmit images, audio and video on digital exchange platforms. Hence, each and every person should be acquainted with the digital devices and the operating platform on the devices.

The application of digital content or soft copies is applicable in most of the areas. The process of admission into colleges, entrance examinations, form fill up for jobs, interviews, government projects etc. all involve activities done in digital format to reduce the time taken for the work and convenience to the people. So it is very important for every common man to be knowledgeable about the common digital techniques, social networking, internet access procedure etc. Handling mass works is becoming a tough task today which is being slowly replaced by computers.

The population of the world is increasing day by day and the mass repeatable activities which were done by human beings are replaced by analytical robots. The process of finger sensors, face sensors, voice sensor recognition techniques are used to reduce manual verifications for quick processing of work.

Analytical robotics, today not even does repetitive jobs but also analyses information to produce results as equal to a human being. It is preferable to each and every person to have an idea of Digital Platform.

Outcomes

Upon completion of this unit you will be able to:

- *Describe* the process of scanning i.e., transferring of paper content into a Digital Image content using Scanners.
- *Identify* the aspects of Camera.
- *Use* the software's used in Image Editing.
- *Practice* the process of image editing.
- *Apply* the process of colour correction in an image using software.
- *Explain* the process of masking in a design.

Terminology

Scanning: The Process of transferring documentation on a paper to a digital format. It can be said that the conversion of a hard copy format into a soft copy format is called Scanning.

Image Editing: Manipulation of a Photo or an image to make it better in terms of clarity is called Image Editing.

Masking: Making a graphics to appear in a particular shape is called Masking. For example, a rectangle shaped photo is masked into a Circle. The photo can be viewed only up to the border of the circle and not beyond it.

Capturing Images: Taking Photographs using camera is called Capturing Images or scenes. The quality of capturing images depends upon the quality of the Camera used.

Scanning and Capturing Images

Scanning is the process of transferring content in a piece of paper into digital format. The content in the paper can be text, hand written matter, drawing, painting, photograph etc. The device which is used to do scanning is called Scanner. It is a device in which we place the paper on the glass and it captures the data in RGB format of the computer.

History of Scanning

Telephotography and fax were the input devices which were used in the early days for transmitting messages from one place to another in paper format. These sources inspired the idea of modern scanners of today.

In the year 1860s, the historical form of facsimile machine which used to transmit images on a telegraph line was introduced by Giovanni Casselli. It was named Pantelegraph, which started to be used commercially for practical purposes. It used Electromagnets which matches the movements and creates an exact replica of the image at source. The size of the paper used to transfer was around 150 x 100 mm.

After few years, photocells were used for scanning and the data generated was transferred using Phone lines. This process was adopted by AT&T for their wire photo service. This type of technique was also experimented in Europe and named Belino. The media agencies of newspaper, T.V., Radio etc. used this system in the 90s era for their business purpose.



Types of Scanners

Drum Scanners	PMT Tubes i.e., Photomultiplier Tubes were used to transfer the information using Drum Scanners. Three colours are used to capture images i.e., Red, Green and Blue. The content is divided into these three channels and transferred into Digital System.
Flatbed Scanners:	These are the scanners which are used now- a-days for scanning paper contents. A thin light beam passes over the content which transfers the content line wise into a Digital Image format.
CCD Scanner	CCD (Charged couple device) scanners are made up of three arrays or rows. They contain sensors of Red, Green and Blue colours which are called Primary Colours.
CIS Scanner	CIS (Contact Image Sensor) also used Red, Green and Blue LEDs for illumination purpose. For the purpose of light collection the LEDs are connected to a monochromatic photodiode which is placed under a Rod.

Apart from these, there are also other scanners like Film, Roller Scanner, 3D Scanner, Planetary scanner etc. Due to the rise in technology, the types of scanners are developing in the quality and providing excellent results.

Process of Scanning

- “Power On” the Scanner
- Insert the image in the glass bed of the scanner upside down as done in case of a Xerox Machine.

1. Choose the Photo	2. Open the Scanner and place the photo upside down
 [Screenshot]	 [Screenshot]
3. Place the photo upside down	4. Close the scanner

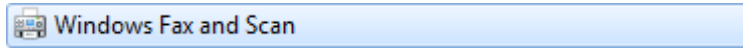


[Screenshot]

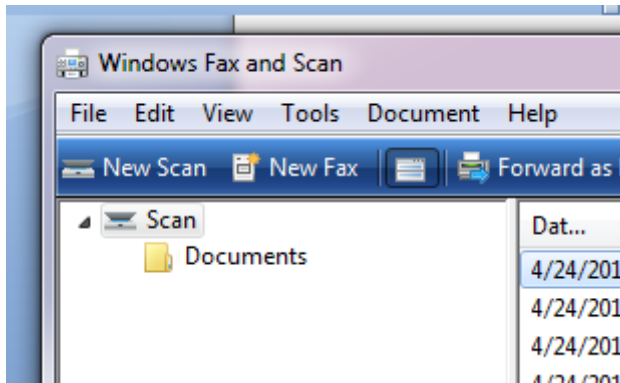


[Screenshot]

- Open the software for Scanning

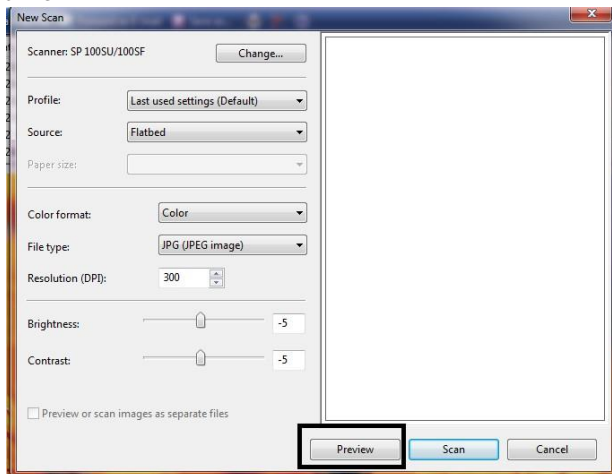


- File – New Scan



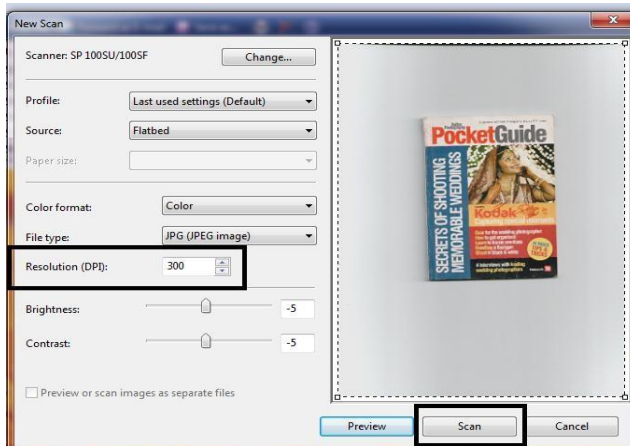
[Screenshot]

- Click on “Preview”



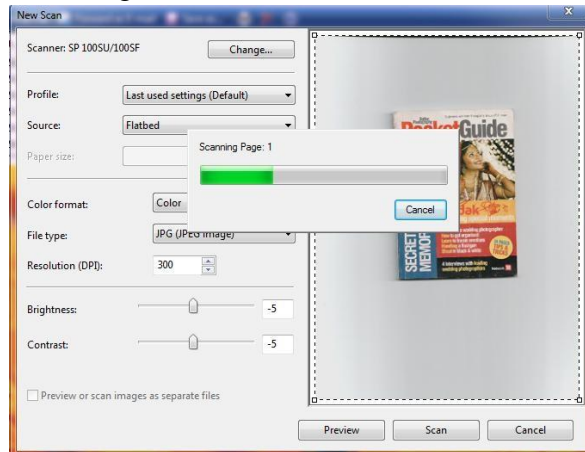
[Screenshot]

- Choose the Resolution as 300 DPI [Minimum standard for good print quality]



[Screenshot]

- Click on “Scan”
- The Process of scanning will take around a minute.



[Screenshot]

- After the scanning is complete, it will save the image in the computer in the default folder of scanned images.

Capturing Images

The medium of capturing images from the live scene is called Camera. It is optical equipment which is used for clicking images and storing photographs. Today, we have Digital Camera's which has the capability to display the positive of the image immediately after clicking it on its display. In today's life almost everyone has a camera in-built in his/her mobile.



Canon FT camera ,135mm 1:3.5 lens of the 90's

**Title-Camera Attribution-
Alvesgaspar Source-Wikipedia
Link-**

<https://en.wikipedia.org/wiki/Camera>

The cameras in the beginning used Negative as the source to store the image which is clicked. Then the image is taken to Photo Lab where the image is developed in a dark room. After that the positive is derived out of it. This process takes around 2 or 3 days for the customer to get the positive of the image taken.

The quality of the image depends upon the lens of the camera. To achieve better results of a far distance scene, high range lenses are mounted on the camera.

Photos and Photography has always remained a passion for each and every human being. They feel happy watching at the glimpses of

photographs of self and others in various moods and places.

The excessive interest in Photography has been the motivation to develop high end cameras with quick functionality. This gave birth to Digital Cameras which was a revolution in the world of Photography.



The immediate output is one of the feature which has delighted everyone. Digital camera is available in most of the households as a part of home accessory. It is no more a luxury, it is a part of a daily entertainment to capture moments and make it memories.

Title-Camera front & Back

Attribution-[Antoine.01](#)

Source-gemaakt met digitalecamera Olympus X-720

Link- <https://commons.wikimedia.org/wiki/File:Olympus-digitale-camera-FE-130.JPG>

Digital images are stored in digital format hence it is very easy to transfer and share images. Websites like Facebook, whatsapp etc. have grown to a huge extent due to its photo sharing capability.

Image stored in digital format are very durable and do not get distorted or damaged. It remains in the same quality in which it has been taken. It can be stored for all the generations to come with perfect quality.

Resolution of Capturing Images on a Camera

The resolution of Capturing an Image depends upon the Optical Zoom of the Camera. We have also heard of 8 megapixels, 12 megapixel and 15 megapixels also. This is the pixel size at which a shot is made. The more is the megapixels, the more is the size of the pixel of the image. This will help in printing the image at a bigger size with perfect quality. This table illustrates an example of megapixels with pixel size and image size.

Maximum Print Size	Minimum Megapixels	Pixel Resolution
8" x 10"	5 Megapixels	2560 x 1920
11" x 14"	6 Megapixels	2816 x 2112
16" x 20"	8 Megapixels	3264 x 2468
16" x 24"	12 Megapixels	4200x 2800

The latest Digital Cameras have all the capabilities to capture an image with high quality output. It depends upon the knowledge of the user to choose and capture images as per his requirement.

Image Editing

Images are stored in computer in a pixel format which comprises of grids. This process of storing a Digital image is termed as Raster Graphics. It contains the information of the position and colour of each and every pixel which combines into an Image when displayed on computer software or any digital platform.

The images which are captured can be stored as well as edited with the help of software's. The images are edited to make them look better. There are automatic settings fitted in cameras which rectifies the image and produces a bright and clear image in dim lighted areas also. Even though the photo is dim, there are computer software's with options which automatically corrects the colour of the image.

The few features of images which can be edited in computer software are described with the process.

- **Selection and adjusting a particular part of an image.**

In a Particular image, we can select an area using the selection tool of software and make modifications to the selected area or delete as per our requirement.

- Open Krita
- File – Open [Open an Image]



Title- River - Landscape

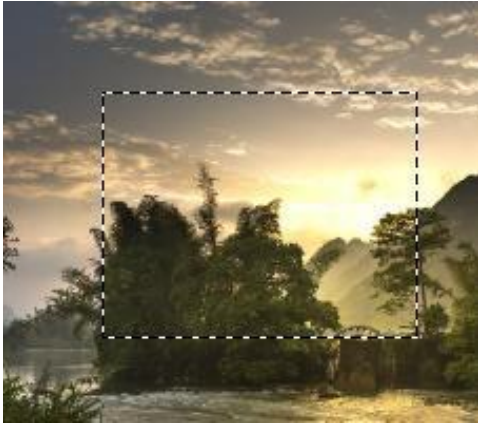
Attribution- Quangpraha (User name as per pixabay)

Source- Pixabay

Link-<https://pixabay.com/en/rivers-river-the-landscape-wheel-3059562/>

-  Rectangle Selection Tool

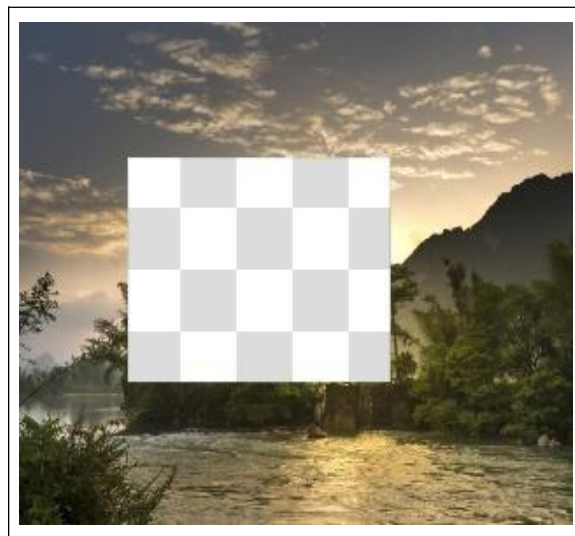
Select an Area



[Screenshot]

Press Delete

Select Menu - Deselect




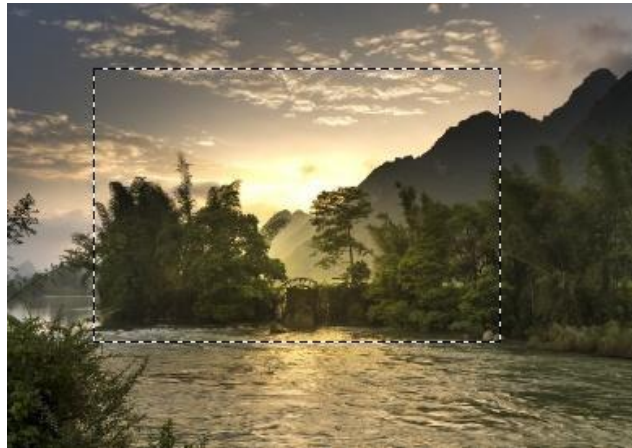
- It will delete the selected area.
- **Merging two or more images via Layers**

Two different images can be merged into a single image using Layers. This helps to move the layers or remove it at any time.

- Open Krita
- File – Open [Open an Image]



-  Rectangle Selection Tool
- Select an area



[Screenshot]

- Edit Menu –Copy
- File – Open [Open Another Photo]



Title- Red Rocks

Attribution- esudroff (User name as per pixabay)

Source- Pixabay


Link-<https://pixabay.com/en/hiking-red-rocks-valley-of-fire-3057280/>

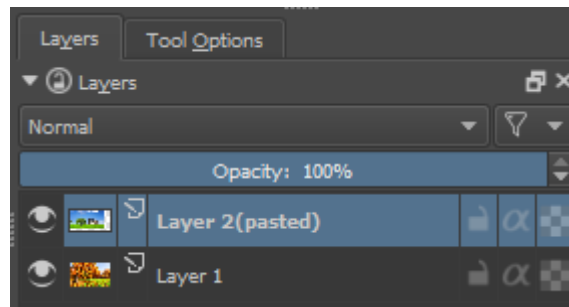
- Edit Menu – Paste

It will paste the selected portion of the first image in this file. This will create a new layer in the layers panel.



[Screenshot]

- We are resize the image using  Transform Tool



[Screenshot]

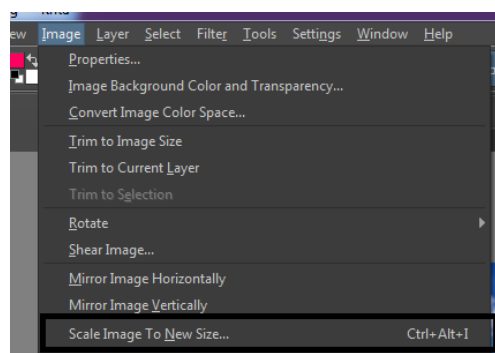
- **Changing the Image Size according to requirement**

An image can be opened using the software and the size of the image can be changed according to the need of the Project. However, if the size of the image is increased the pixels of the image will get distorted. But, if the size of the image is reduced, there will be no effect in the quality of the picture.

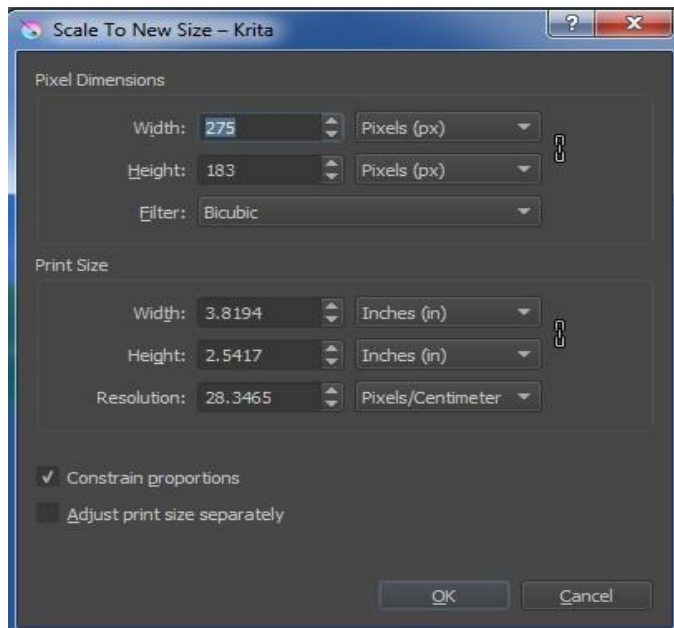
- Open Krita
- File – Open [Open an Image]



- Image Menu – Scale Image to New Size



[Screenshot]




[Screenshot]

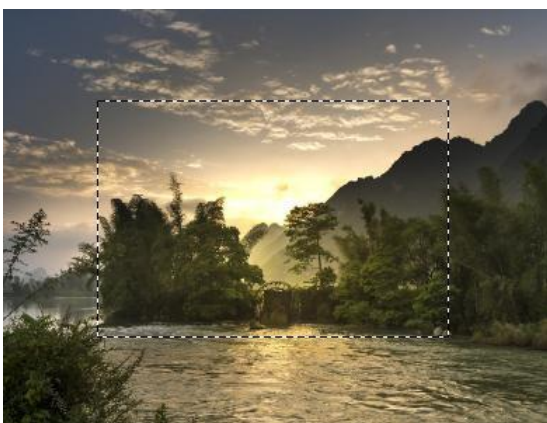
- Change the width and height as required and press OK.
- **Cropping of an image**

There are situation when we take a photograph or scan an image, we get some portions which seems to be not required at the edges. We can select the portion only which we want and remove the remaining areas using the Crop Tool.

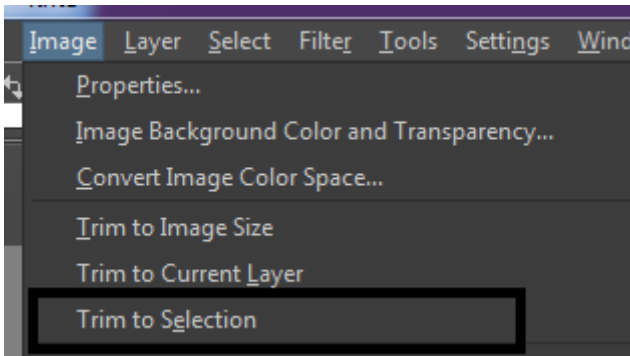
- Open Krita
- File – Open [Open an Image]



-  Rectangle Selection Tool
- Select an area



- Image Menu – Trim to Selection [In some software, Crop is termed as Trim]



[Screenshot]

- The output will be as follows:

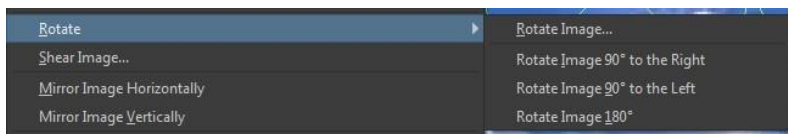


[Screenshot]

- **Changing the Image Orientation**

The angle of the Image can be rotated by any angle as required. We can even Mirror the image horizontally or vertically as per our need.

- Open Krita
- File – Open [Open an Image]
- Image Menu – Rotate

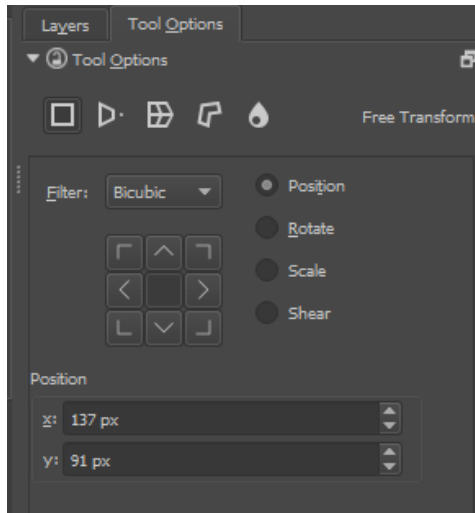


[Screenshot]






- Image Menu – Mirror Image Horizontally
- Image Menu – Mirror Image Vertically
- **Transforming, Perspective and Warping Images.**

The image can be applied transformations, adjust the Perspective and Warp Images. When we take a photograph, it may or may not fit the area in which we want, hence, we need to manipulate the transformations i.e. Move, Rotate and Scale the image to fit our requirement.

- Open Krita
- File – Open [Open an Image]
- Choose the Transform tool 
- Tool Options –
- We have the options required for editing.



[Screenshot]





-  - Free
-  - Perspective
-  - Warp
-  - Cage
-  - Liquify
- Choose each tool and click and drag on the specific area of the image to view the result.
- **Cleaning a damaged area using Clone stamp**

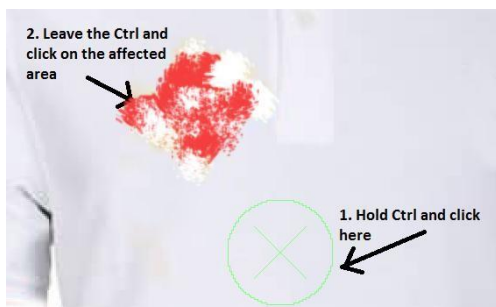
There are situation when we take a photograph or scan an image, we get some portions which seems to be not required at the edges. We can select the portion only which we want and remove the remaining areas using the Crop Tool.

- Open Krita
- File – Open [Open an Image with some stain marks]



[Image Composition by the Author]

- Our motive is to clean the stained areas of the Image
- Choose  Brush Tool
- Brush Settings  – Clone Tool  Clone
- You will be able to see a green marker 
- Hold Control and Click on a nice area
- Leave the Control and Click on the Affected area



[Screenshot]

- Repeat the process as many times as required to clean the affected area.
- The output will be as follows.

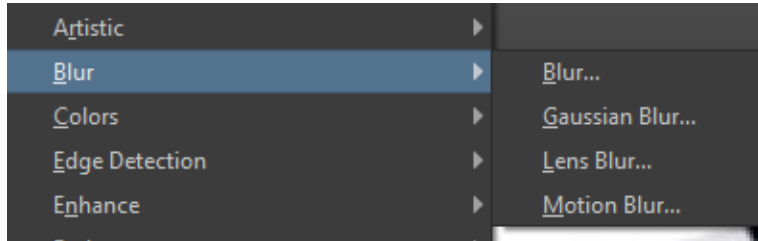


[Screenshot]

- **Blurring the Images and Reducing Noise**

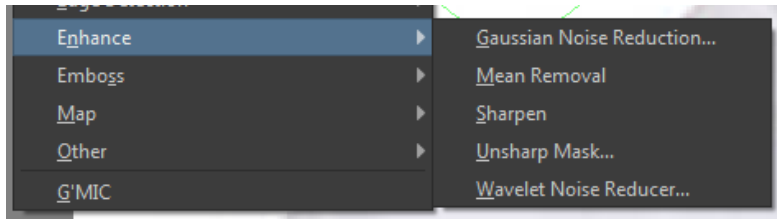
There are occasions where we get noise in a photograph due to inadequate lighting. In that case we have options in computer software to reduce the Noise using the Blur technique

- Open Krita
- File – Open [Open an Image with some stain marks]
- Filter Menu – Blur



[Screenshot]

- Or Filter Menu – Enhance – Gaussian Noise Reduction



[Screenshot]

- Any of the above two can be applied for Noise reduction.

- **Creating Artificial Lighting**

When we take a photograph, it comes with the natural lighting of the scene. There are some in-built capabilities in Camera like Flash etc. which can correct the light of the image to a certain extent. But there are cases where the default settings of the camera output do not suit our requirement. So, we want to increase the brightness of a particular area using the artificial lighting which can be added using software's. In software's like Photoshop we have the option in the Filter Menu – Render – Lighting Effects and Lens flare. We can manually draw using the brush tool and create the effect of an artificial light.

- **Application of Filters**

Photographs and images are edited and enhanced using the application of Filters in software's like Krita, Photoshop etc.

- Open Krita
- File – Open [Open an Image]
- Filter Menu – Apply and Practice and all options one by one to view the changes in the image.

- The options in Filter Menu are experimental and developed by the coding experts in a random manner to create abstract form of images. Some output from the options can be explained in particular whereas other are creative forms which do not have exact meanings.

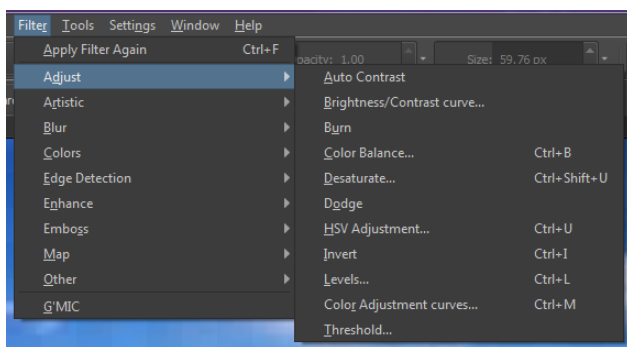
Colour Adjustments

Colour Adjustment or Colour Correction is an important part of Image Editing. When we take a photograph it comes with the default settings. But we can enhance and change the colour settings using software's. We can take a photograph in day time and convert it to a theme where it would look like it has been taken in night or a cloudy atmosphere.

- Open Krita
- File – Open [Open an Image]

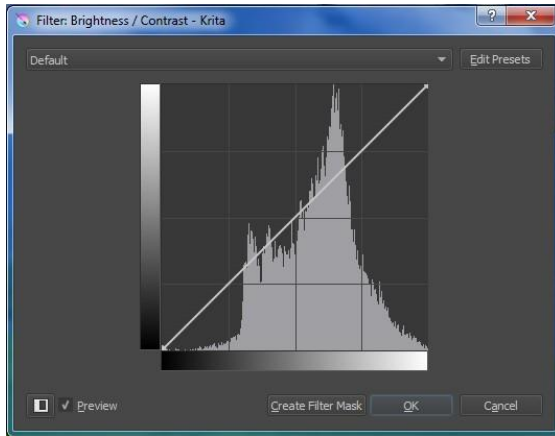


- Filter Menu – Adjust – [Options]
- All the options under the Filter Menu – Adjust will change the colour settings of the image. The user has to apply the effects one by one and decide which suits his requirement.



[Screenshot]

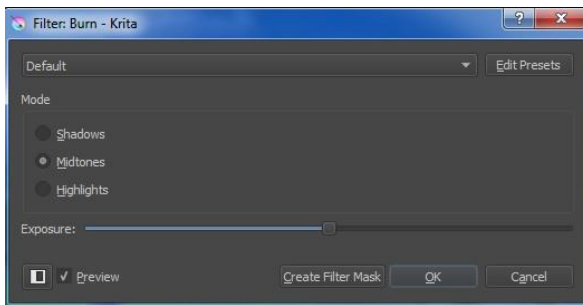
- **Auto Contrast** – It automatically sets the contrast of the image as per the default settings of the Software for an image.
- **Brightness / Contrast Curve** – It will change the brightness and contrast of the image as done in case of a Television or a Computer Monitor.



[Screenshot]

The line has to be adjusted by moving up or down for the effect.

- **Burn** – It will Burn the image or create a dark shade of an image.

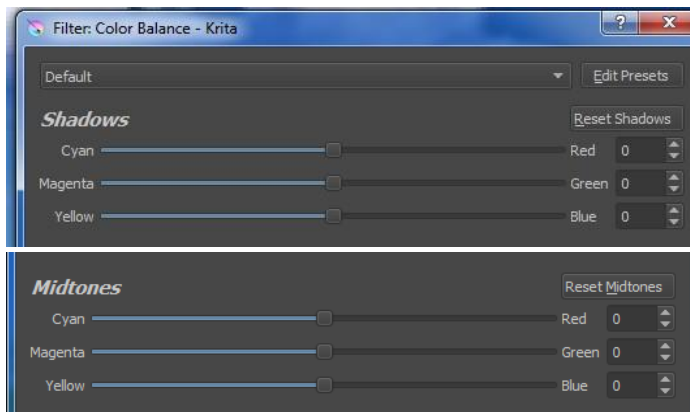


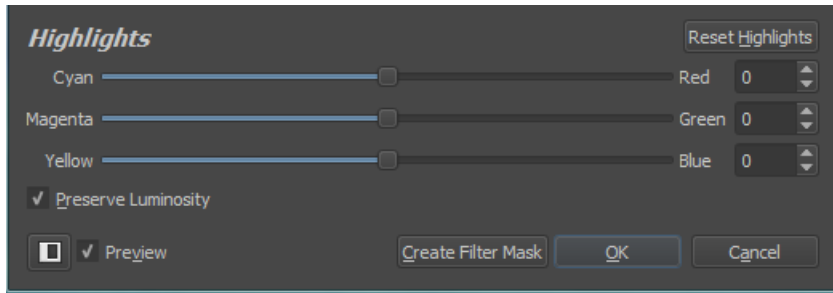
[Screenshot]

Shadows indicate the dark shades of an image, Midtones indicates the mid shades of an image and Highlights indicate the bright shades of an image.

We have to select them one by one and change the Exposure. The preview icon will display the output before pressing the OK Button. After getting satisfied with the output one can click OK.

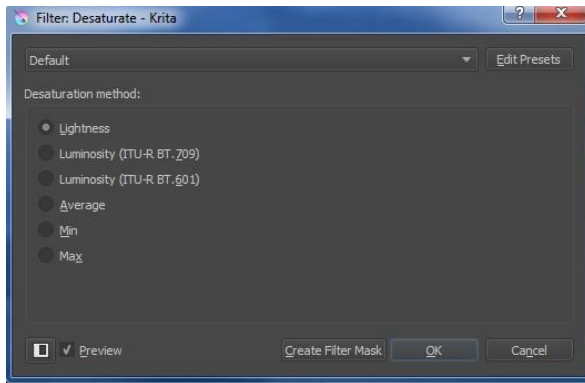
- **Colour Balance** – It will change the colour balance by changing the options.





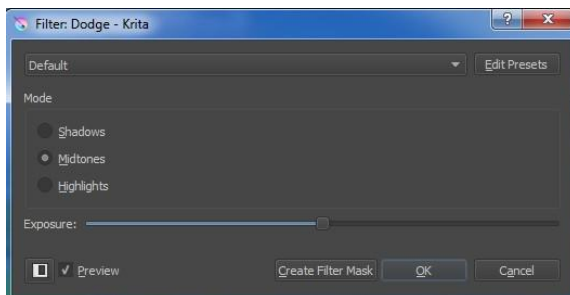
[Screenshot]

- **Desaturate** – It will convert the image into Black and white shade.



[Screenshot]

- **Dodge** – It will convert to extreme brightness or to extreme darkness.



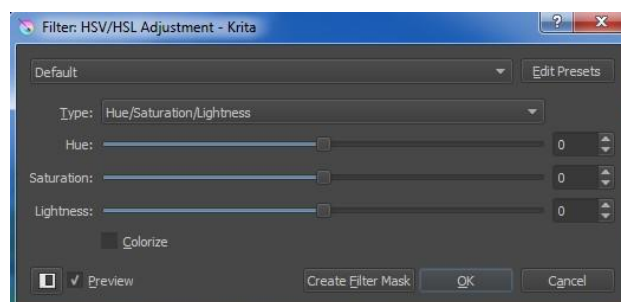
[Screenshot]

- **HSV Adjustment** – It is a type of colour adjustment which includes Hue, Saturation and Value.

Hue – Hue stands for the spectrum of colours.

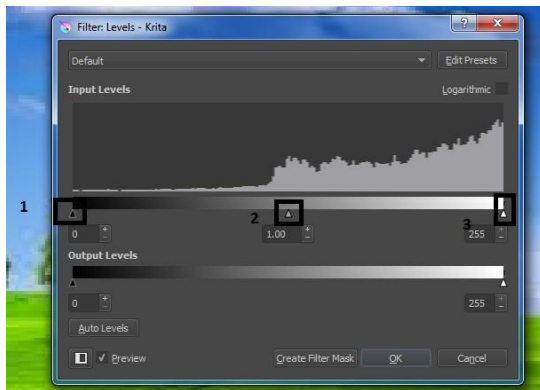
Saturation – Saturation stands for the colour depth from main colour to its respective black and white shade.

Value – The change of value of the colour from its white coordinate to main colour and back to its black coordinate.



[Screenshot]

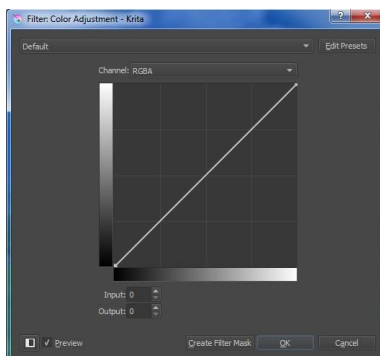
- **Invert** – It will reverse the colour channels of the image hence turning the image into a negative kind of effect.
- **Levels** – It is used to change the lighting theme of the image.



[Screenshot]

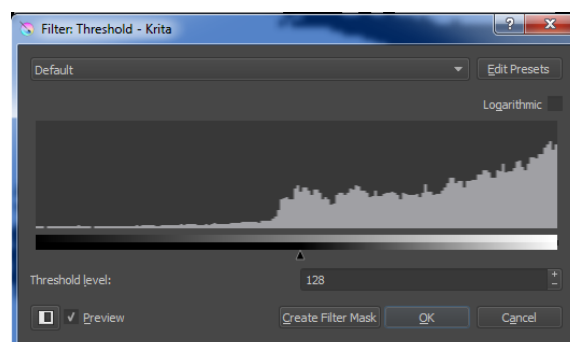
There are three markers for adjustment-

1. Shadows
 2. Midtones
 3. Highlights
- **Colour Adjustment Curves**– The colours can be adjusted by choosing the Channels and the curve in the panel.



[Screenshot]

- **Threshold** – It will convert the colour into a Single colour mode where we will have only black as the key colour with white background. This is done for creating an outline sketch of an image.



[Screenshot]

Masking

Masking is the effect of placing a photo inside a particular shape. It is done using the help of software's like Krita, Photoshop etc. This kind of effects is basically used in commercially done designs. In this case we see an image wrapped inside a Circle, Rectangle, a Love shape, Text etc. This adds to the creative design aspect of the designer. This kind of effect appeals to the consumer or viewer.

- Open any Image Editing Software.
- Select the Image which you want to warp inside a mask.
- Create a mask i.e. Shape, Text, Hand drawn design etc.



[Composition by Author]

- - Photo inside a Circle

MASKING

[Composition by Author]

- - Photo inside a Text

There are enormous examples of this kind of masking effects in Leaflets, brochures, catalogues etc. Any image with a different structure creates a visual appeal in the minds of the people. They are extraordinary than a rectangle shaped image. It conveys the message of two things at a same time. One is the Image and the other the shape or text in which the image is display. Again these masked images are supported by outlines, shadows etc. to create a more depth effect. It is a composition of effects which makes an image attractive.

Unit Summary

In this Unit you have learnt about the process of converting paper content into a digital content via scanning. You learnt some of the options related to Camera and resolution. We came to know about the theory of Image Editing as well as the Practical of some of the image editing using open source software Krita.

You can also do colour corrections, colour adjustments and masking of an image. These tips and techniques will help you to use the software effectively. The motive of learning an image editing software has to be clear before entering into practical. This will help in knowing

the applicability of the functions of the software in projects or commercial works.

Assignment

- Scan a newspaper advertisement to Computer.
- Make your signature in a paper and scan it to Computer.
- Take 10 photographs using Digital Camera or Mobile Camera and transfer it to computer.
- Open an Image in Krita and use the Image Editing options. Save each section in a new file.
- Write all the above Assignments in DVD using Nero with the
- video output, raw source files of the software used and submit it to the University.

Resources

Digital Image Scanning and Editing Basics

<http://scantips.com/>

Image Masking *<http://www.xinapse.com/Manual/masking.html>* **Image**

Colour Corrections for Cinemascope view

<https://fstoppers.com/education/how-apply-cinematic-color-grading-your-still-images-56538>

Unit 4 Raster, Vector Graphics & Typography

is intended for people who want to become a Graphic

Introduction

Graphics is being used in each and every segment of work in almost all the industries. It is not restricted to Design segment only or Computers only. Graphics today are mostly generated out of Smartphone camera. Smartphone phone cameras come with the resolution of 8x, 12x which is equivalent to a quality of Digital Camera few year ago.

Graphics are categorized into two segments, Raster Graphics and Vector Graphics. Whenever we see an image or photograph it consists of photographs, shapes, effects etc. All of the photograph contents are Raster Graphics which are captured using Cameras. The shape content may be Raster or Vector depending upon the software used for creating of the content.

Typography has grown leaps and bounds in the digital age. Typography is referred to the style of writing or handwriting of a particular person. People were appreciated for their good, neat and clean handwriting, but now-a-days handwriting is no more seen as a barrier for people. All the handwritten matters are replaced by Computer Fonts. There was a time where letter styling was the property of a manual artist who uses his skill and knowledge of pencil art to create a design of a text. In digital age, it is called Fonts. Fonts are designed and created by artist once and it can be used in all the software's. Any computer user can create content using beautiful typographical effect irrespective of his/her handwriting.

Outcomes

Upon completion of this unit you will be able to:

- *Differentiate* between Raster and Vector Graphics.
- *Describe* the use of resolution in a Printing Unit.
- *Create* Vector design using software's.
- *State* process of applying Typography via Computer Fonts in creating Designs.
- *Use* software's used in creating Raster and Vector Graphics.

Terminology

DPI: Dots per Inch. This is the resolution measuring unit of a Design. The resolution is required in Scanning an image, Capturing an image from camera, Printing use etc.

Raster Graphics or Bitmap Graphics: An image which is composed of grid and pixels.

Vector Graphics: A shape which is created from mathematical calculations.

Typography: The style of representing a text in various design forms.

Font: The word used in Computer for Typography for representing Text.

Raster Graphics

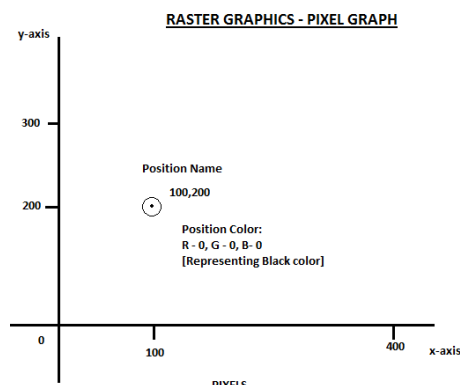
A Raster Graphics is an image made up of rectangular grids which are called pixels in computer language. Whenever we see an image or any photograph on a digital format it is a combination of pixels. It is called a Bitmap Image or Bitmap Graphics.

The word Raster is originated from Latin word “rostrum” which means a rake. A monitor of CRT (Cathode Ray Tube) presents an image each line magnetically which is steered by an electron beam which is focused.

The pixel contains the position information and the colour information. When all the information is combined together in a Digital Platform, it generates the image. It is stored in the format of a Dot Matrix.

The files of Raster graphics format are stored in various formats. Some of the mostly popularly used formats are BMP, JPG, TGA, TIFF, PNG etc.

A Pictorial example of a Raster Graphics technically can be represented as follows:



[Created by the Author]

Size of the Image:

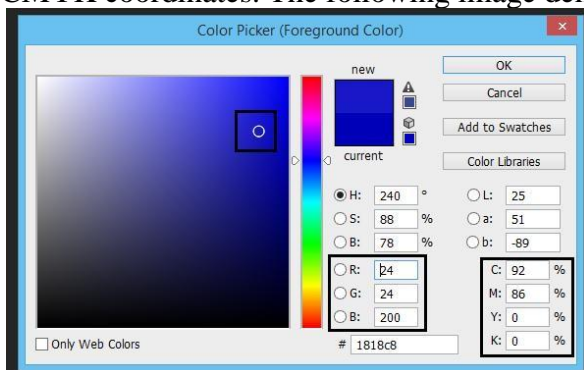
The measuring unit of a computer screen is pixel. Suppose we taken an image of 400 pixels in width and 300 pixels in height. The total number of pixels used in the file would be $400 \times 300 = 12,000$ pixels.

Each pixel is identified by its x axis and y axis position. Suppose we take an example of a point (100,200). It will be identified by its position.

Colour of the Image

The colours used in digital format come in two modes. One is RGB Mode - Red, Green and Blue. The other mode is CMYK – Cyan, Magenta, Yellow and Black.

The RGB mode is used for on-screen presentation formats like Monitor, Television, and Mobile etc. The CMYK mode is used for printing formats on paper, flex etc. Every colour has its own RGB and CMYK coordinates. The following image demonstrates a colour coordinate.



[Screenshot]

When we choose a colour blue, we have its RGB coordinates as well as its corresponding CMYK coordinates.

Resolution

Resolution is a very important factor which determines the quality of the Image. The Digital cameras and the scanner plays a big role in bring a photograph into digital shape. The quality of cameras and scanner define the clarity of an image. The resolution of a computer screen starts from 640 x 480 pixels, 1024 x 768 pixels etc. Likewise all the images require to be presented in particular pixel format. Some of the examples of pixel sizes used in different industry formats are as follows:

For Monitor Display	640 x 480 pixels, 800 x 600 pixels, 1024 x 768 pixels etc. The size of the pixels varies according to the size of the monitor.
For Television Display	NTSC Format – National Television Standard Committee – 720 x 480 pixels in the display ratio of 16:9. PAL Format – Phase Alternate Line – 720 x 576 pixels in the display ratio of 4:3. HD Format – High Definition -1920 x 1080 Pixels in the display ratio of 16:9.

For Print formats	<p>The Resolution plays a vital role in print formats where the pixel size has to be related with the measuring unit of print (cm, mm, inches) etc.</p> <p>Resolution for Print for matters which required to be read from near the eyes like magazine, brochures etc. is 300 pixels/inch.</p> <p>If we need to print an image matter of 5 inch x 4 inch, then the pixel size should be (5 x 300 = 1500 pixels) x (4 x 300 = 1200 pixels). The size of the image captured depends upon camera like 8x, 12 x etc.</p> <p>Resolution for print of matters which required to be read from a distance like hoardings, banners etc. is 72 to 100 pixels/inch. If we need to print an image of 10' x 6', then the pixel size should be (10' x 12 inches x 72 = 8640 pixels) x (6' x 12 inches x 72 = 5184 pixels).</p>
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The resolution for big size printing is less due to the following reasons:

- The matters required for a big size print are basically larger in size and are to be viewed from a distance. The square pixel dots will exist but will not be affecting the person's view because he watches the subject from a distance. But in case of magazines, product catalogues etc. the person views from nearby the eyes so the less pixel resolution images get distorted and is clearly displayed as a poor quality image. This does not happen in case of a hoarding or big banner.
- The capacity of a computer system is a hurdle for big pixel sized image. A 10' image with a 300 pixel/inch resolution will result in a size which may hand the computer system or be very slow in operation. It is practically impossible to do mass work with 300 pixel/inch resolution for huge size prints.
- The process of transmitting data from the computer to printer will take more time according to the size of the file. The time taken for transmitting a 300 pixel/inch file will be relatively much more than a 72 to 100 pixel/inch file. Even though a designer has designed a hoarding in a 300 pixel/inch resolution, the flex operator will reduce it to 72 to 100 pixel/inch and process the printing.
- The ink consumed in printing for a big resolution file will be also relatively more. So, for this purpose also the printer reduces the resolution for higher size prints.

Scaling capability as a demerit of Raster Graphics

The only one demerit of Raster Graphics is its inability to scale maintaining the quality of an Image. Whenever we scale an image beyond its 100% capacity it will get distorted. However, we have software's today which use blur technology to reduce the rectangular patch

output which used to occur in older Raster Graphic Editors.

Scalability is an issue when we use images by choice from varieties of images from internet. Because, in internet we may find an image with the content we like, but the resolution of the image may not be equal to the size in which we want to fit. In that case, we scale up the image using software tools which result in distortion up to the extent in which it is scaled.

But, when we know the content we want, then we choose our camera accordingly and hunt for the images in various places. In that case, we won't require scaling because we have prepared our hardware (camera) according to the content of the software. For example, we need an image for advertisement in a newspaper of 5 cm x 5 cm. We can capture the image with an 8x camera. But if we want an image to be used in a hoarding of 20' x 10' then we have to use a high end camera with a high optical zoom capacity and around 12 to 20 megapixels resolution.

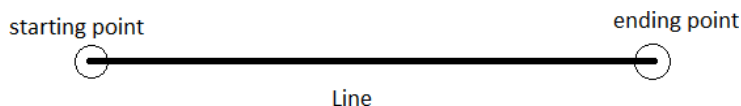
So, scaling is a demerit for only those who use readymade images with low resolution. Some images may be up to the mark and some may not. But when a designer hires a professional photographer and conveys his requirement in form of size and quality, then the image need not be scaled beyond 100%, hence achieving the best content.

Vector Graphics

Vector Graphics is derived out of mathematical calculations. It stores the information in form of x axis and y axis of the end points or nodes of the shape. Basically, the shape related contents and text related contents are done using vector software's. The end points are termed as node, point, vertex etc. in different vector software's. The end point is supported by handles or tangents for smoothness purpose.

The following example demonstrates a vector shape:

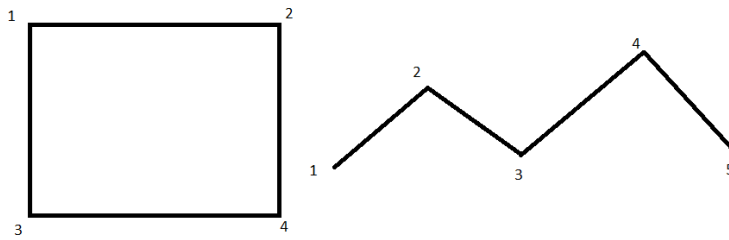
- Line



[Created by the Author]

In vector software, in case of line, it is defined by its starting point and ending point coordinates. When we create a file in vector software, make and line and save it, it will save the coordinates of two points. It does not matter about the length of the line. It is automatically generated when we open the file in the vector software again. This also helps in reducing the size of the file without reducing the content. This is also called compression of data in terms of computer language.

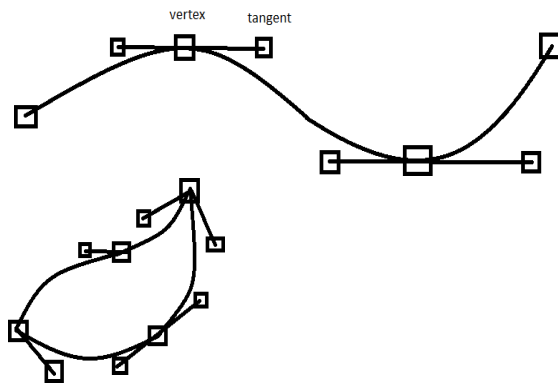
- **Rectangle, Polyline**



[Created by the Author]

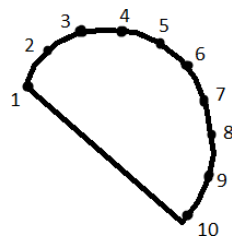
In the same way as of a line, the above shapes are stored in form of its end points. Along with the end points of a shape, the vector design also stores the properties of the shape such as stroke colour, fill colour, stroke outline thickness etc.

- **Smooth lines**



[Created by the Author]

The above design in a vector shape is called handles or tangents. It creates the smoothness of a vector shape without increasing the number of points. In old process, if we needed a smooth shape then we have to create more nodes or points.



[Created by the Author]

However, when we scale the shape the outline will be displayed as straight lines.

Properties of Vector Graphics

Scalability

The design produced in vector graphics is scalable up to infinite extents without any distortion. This happens because the end points or curves are stored in the memory. For instance, if we take a triangle of 5 cm in width and 5 cm in height, it has got 3 end points. If we

take a triangle of 20 cm in width and 20 cm in height also, it has also got 3 end points. So size is not a matter of vector graphics because the in-between gap of end point is instantly generated by the software as soon as you open the file. Hence, scalability is a very big advantage for designers. A designer creates a logo in vector graphics because a logo needs to be printed on a small envelope as well as on a big hoarding. A vector design solves both the purposes.

Minimal Space Consumption



Vector Data is hugely used in Web design world where the memory of the file plays a big role in fast downloading and uploading of the data. Most of the website today is powered by Flash content which use Vector graphics for its content. The most important thing is that quality is not compromised for space reduction. The quality of vector graphics is very much crystal clear in any size which it is produced.

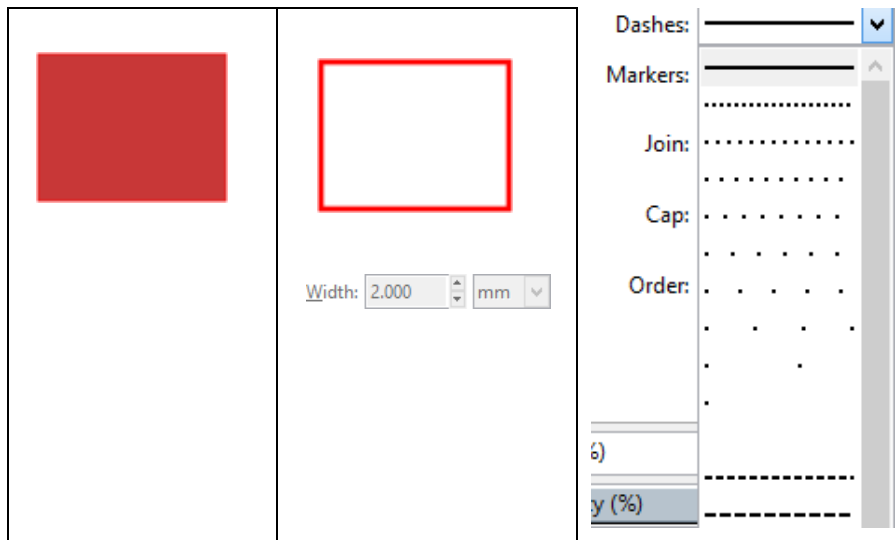
High Processing Speed

The speed of producing or processing the data is very higher. It happens so due to its less space consumption. The modifications done to a vector graphic design is property wise i.e. Move, Rotate, Scale, Stroke Width, Fill colour, Scale colour etc. All these properties are placed in vector based software in a systematic way which can be changed even at a click at any time required.

Apart from all its advantages, Vector Graphics cannot be used in Photograph in high detail. Vector Graphics are only for shape related and text related contents. Images can be applied in vector graphic software along with vector shapes, but when we zoom into the subject, the images will get distorted, but the shape is not. So, one has to be clear in vector graphic software that whatever shapes you create in Vector Graphic software is scalable but the image pasted into a vector graphic software is not scalable without distortion if it extend beyond its 100% pixel size.

Properties of Vector Design

Outline Shape	Outline colour / Stroke Colour	Stroke Style
		
Fill Colour	Stroke Thickness	



[Created by the Author]

Software used in Vector Graphics

Open Source Software	Commercial Software
Inkscape – for Design Vectr – for Design	CorelDRAW – for Design Illustrator – for Design
Synfig Studio – for Animation	Adobe Flash – for Animation
Blender – for 3D	Autodesk 3ds Max – for 3D

Vector Graphics in various Industries

Game Industry

Vector Graphics are used for creating Game designs. There are thousands of games done using Flash Animation and Graphics which use Vector Shapes. Early day Arcade games were done using Vector Graphics.

Web Design Industry

Animated Flash banners are extensively used in web pages to make the webpage more lively and attractive. It helps to deliver with less memory and high quality output. Advertisements on web use flash because it is animated with excellent quality and a moving information using images give more and effective information than a still text.

Cartoon Industry

All the cartoon animations, cartoon films and cartoon serials are done using vector graphics. In olden days, each and every frame was hand drawn and painted by the artists, but today all the work is done using Vector graphic animation software's.

3D Industry

All the 3D software's are vector graphics. Software's like Blender, 3dsMax, Maya etc. used for creating 3D contents for all purposes are vector based. It combines the vector capability with 3D space. Art oriented design is now being armed with scientific coding and the artists are able to create new and attractive heights in design.

Difference between Raster Graphics and Vector Graphics

Raster Graphics	Vector Graphics
It is a combination of rectangular grids or pixels.	It is generated through mathematical calculation.
Each pixel consists of position information and colour information.	It consists of node/vertex/point information, shape properties like stroke colour, fill colour, stroke width, stroke style etc.
Any photo related subject is a Raster Graphics	Any shape related subject created using Vector Graphic Software is Vector Graphics.
Pixels get distorted on enlargement of the image beyond 100%.	Pixels do not get distorted on enlargement up to infinity.
The bigger is the size of the image, higher is the memory.	The memory depends on the curves, not on the size of the shape.

Typography

Typography is the art of displaying text in a most appealing and attractive manner. It is a subject of art where different styles of text are developed and used. It includes all the properties of a text like its size, word spacing, word stretching or squeezing, line spacing, paragraph spacing etc. Typography is used differently for different purposes like official letters have a normal look, letters of weddings written on walls are colourful and stylish, letters of advertisements are presented in a different way. So for every occasion the style of writing is different.

With the advancement of computer and graphics, fonts were developed which created a great revolution in the text design category. Thousands of fonts were developed and now a user

has to only choose from the varieties available. A normal person need not hire an artist to create a stylish text. It is available in computer and can be used in almost all the software's used.

Typography is derived from Greek work "typos" which means an impression and "graphia" which means writing. The glimpses of varieties of typographical outcomes can be seen in the following outputs:

- Advertisements
- Headlines of Magazines
- Hoardings
- Newspaper articles
- Leaflets
- Product catalogues
- Book Covers
- Logo Designs
- Grafitti
- Motion Pictures
- Architectural designs
- Old Age Cave

A great typographical design depends upon the choice of layout, pattern of grid, the combination of colours etc. A creative design can become a good, great or bad design according to the composition of all the properties of typography

Properties of Typography

Size

The font size is a very important section in typography. The size of a text is given considering its usage. For example, heading of a book, heading of a chapter, normal body of the text, text required for poster/hoardings of huge size etc. Point is the basic measuring system used in all software's to measure the size of the font. One point is equal to $1/72$ of an inch. Size is related to the readability of a subject either from a nearby or far distance.

Leading

The distance between two lines is called leading. The distance between lines make the text look more readable and resemble a neat outlook. In the old days when text was done using metal typesetting, lead strips were used for separate one line from the other. Hence, it is termed

as leading. As per standards, the distance between two lines should be somewhere between 1.25 to 1.50 times of the size of the text.

Tracking and Kerning

Kerning is the use of space between two alphabets. There are certain alphabets like “A” and “V”. When these two alphabets are placed one after another (AV) in any word then the adjacent lines should remain parallel for a smooth flow of the writing. In these types of cases, kerning is used. Tracking is used at a place where the spacing between two characters is exactly same whatever may be shape of the alphabet.

Text Box

Text Boxes are used for perfect placement of the letters according to our required place. In software’s like MS Word, the letters or words are typed one after another. This text box helps to insert text in between a blank space at our convenience. The text used in the box may be of same font as other or may vary also as per our requirement.

This is a TEXT BOX. I can place it anywhere.

Hierarchy and Scale

When we prepare a document, there are cases where we have a heading and lots of sub headings under each category. This is distinguished by a hierarchy of scale where the top title resembles a higher size and the sub titles go on decreasing in size till the body of the text. This gives a decent view to the reader to distinguish the main points from each other.

ASIA

INDIA

ODISHA

BHUBANESWAR

Dropcap

Th

is type of typographical setting is used in Newspaper articles. In this case, the first or two alphabets or a word in the beginning resembles a big giant size which is followed by the normal text. These are the designs used as a signature style for different type of textual works.

B – Bold, *I- Italic*, U-Underline

These three form the basics of computer fonts in all the software's ranging from an ordinary WordPad to the latest version of Microsoft Office. A particular set of words can be selected individually and can be assigned Bold, Italic or Underline or any of the combination together. They are like button switches, which activates on one click on it and again deactivates on the other click as desired by the user.

Glyphs

Glyphs are the symbolic representation of a font. Now-a-days font is not limited to alphabets, numbers and symbols. Fonts are used to demonstrate shape, designs, symbols and vector shapes as well. There are font categories of webding, winding 1, winding 2 etc. where we see designs in place of text. Glyphs represent the building block of text. Even an alphabet is a shape if it is not viewed as an alphabet. So if a shape can represent an alphabet then it can represent any type of vector shape or symbol also. So letters, shapes and symbols used in a font are uniquely termed as Glyphs.

Alignment

Alignment is the basic of a document. The Alignment comprises of Horizontal Category of Left, Center, The example of alignment in a document is as follows:

Alignment Left	Alignment Center	Alignment Right
This is for your kind information we are studying the unit of Odisha State Open University. This head office of the University is located in Sambalpur.	This is for your kind information we are studying the unit of Odisha State Open University. This head office of the University is located in Sambalpur.	This is for your kind information we are studying the unit of Odisha State Open University. This head office of the University is located in Sambalpur.

Alignment Justify
This is for your kind information we are studying the unit of Odisha State Open University. This head office of the University is located in Sambalpur.

The Vertical Alignment comprises of Top, Vertical Center and Bottom.

Vertical Top	Vertical Center	Vertical Bottom
I AM IN THE TOP	I AM IN THE CENTER	I AM IN THE BOTTOM

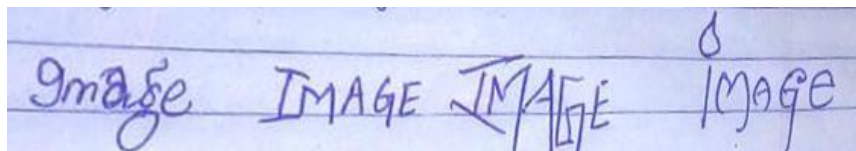
Margins

Whenever we create a document we have the decency to leave margins from top, bottom, left and right. The blank spacing has to be determined and judged by the user depending upon the subject he/she is writing upon.

Apart from the above, there are lots of min aspects about typography which keeps adding on and making fonts more and more attractive. The features of typography are an art combined with science. And the combination of art and science has always created wonderful results.

Steps of Creating Typography

Creating a Rough Imagination

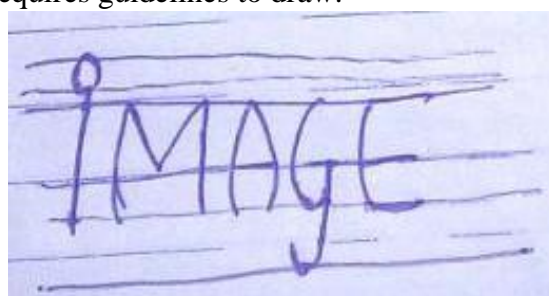


[Created by the Author]

The first step is the creativity. One has to roughly think of a writing style on a piece of paper. Lots of brainstorming has to be made to look the design attractive.

Technical drawing of Typography

After the first imaginary step, the next level is to create margins or guidelines to prepare the text. It can be of any form. When we were kids, we had a handwriting copy with margins. This helped us to learn handwriting and write with correct proportions. In the same way a new typography or font requires guidelines to draw.

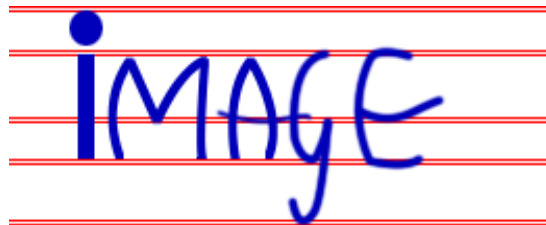


[Created by the Author]

In the above image, the extension of “g” required an extra support in the bottom. This happens in case of “y”, “p”, “q”, etc. Hence a detailed plan has to be made to bring the imagined typography into perfect and accurate reality.

Vectorisation in Vector Software

The handmade design is scanned and taken into vector software and the outlines are traced to form a final neat and clean output.



[Created by the Author]

Unit summary

In this Unit we have learnt about the differentiation between Raster Graphics and Vector Graphics. We came to know the place where we have to use Raster Graphics and where we have to use Vector. We also learnt about the available software’s in the market to learn Raster and Vector Graphics. We learnt about the features of Typography and the process to create a new typography style.

Assignment

- Create your own font with your name as the design style in the steps as mentioned manually. For e.g. Rajesh, *Rajesh* etc.
- Write all the above Assignments in DVD using Nero with the
- video output, raw source files of the software used and submit it to the University.

Assessment

- Name the three Raster Graphic software’s.
- List three Vector Graphic Software’s.
- Differentiate between Raster and Vector Graphics in a multiple table format.
- Write down 3 formats to store a Bitmap graphics.

Resources

Raster Graphics

https://en.wikipedia.org/wiki/Raster_graphics

<https://www.techopedia.com/definition/9098/raster-graphics>

Vector Graphics

https://en.wikipedia.org/wiki/Vector_graphics

<http://searchwindevelopment.techtarget.com/definition/vector-graphics>

Typography

<https://en.wikipedia.org/wiki/Typography>

<http://www.creativebloq.com/typography/what-is-typography-123652>

DMA-02

Digital Imaging

Block – III: Image Development on different Graphic software

Unit-1 Introduction to Krita

is intended for people who want to get their hands on

Introduction

Open source software's mean the software's which are developed by a group of software developers and provide for free on the internet. Anyone can download the software from the internet and use it without paying. It has got all the capabilities and options of professional software which makes it very much useful to the user. In today's life designing and image editing has become a requirement for each and every person. Everyone wants to make their own design whether it is a book cover design, a profile design for their social networking sites, a greeting card design and so on. People want to create their own custom oriented designs.

Krita is open source software which is used for Image Editing. It is very easy software for learners to download and learn. In this unit you will learn about this open source software, which is Image Editing software.

Outcomes

Upon completion of this unit you will be able to:

- Use the tools and techniques of Krita software.
- Identify the Menu Bar options of Krita.
- Create designs using Krita.

Terminology

Krita: Open source software for Image Editing.

Interface: The look or design of software in which the tools and features are arranged in a systematic manner.

Menu bar: Top most panel of any software where we have File, Edit, etc.

Shortcut Keys: The keys used to execute commands.

Use of Krita

Krita can be used for creating almost all types of designs. It is the choice of the user to design in Krita or in any other software. It is the user friendly interface and ease in using the tools which attracts the person towards the software. Krita can be used for the following purposes categorically:

- **Image Processing**

- Mixing Photographs
- Retouching & Cleaning Old and Damaged Photographs
- Converting Black & White Photo to Colour
- Design
 - Digital Painting
 - Cover Design
 - Banners
 - Logo Design
 - Leaflets and Brochures
 - Stickers
 - Card Design
 - Visiting Card
 - Identity Card

There are unlimited types of designs which can be made using Krita. It is the creativity and idea of the user on how to use the software.

Job Prospects after learning Krita

There are lots of Job Prospects after learning designing in Krita. These are the following categories and Places where different types of designing are done:

- Advertising Agencies
- Textile Designing Agencies
- Illustration / Book / Magazine Publishing Industries
- Designing for Webpage Interfaces
- Designing for Software Interfaces

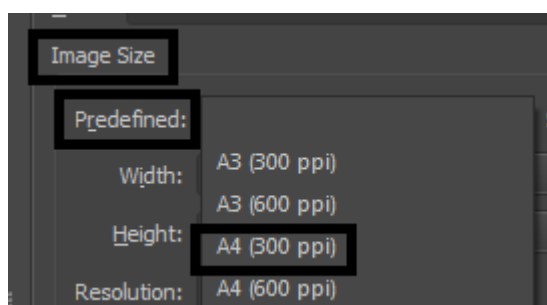
Practice the Practical tools point wise as mentioned.

Tools of Krita



Freehand Brush Tool [Shortcut – B]

- File – New



Screenshot

Image Size – Predefined – A4 Size (300 ppi (pixels per inch))

- Choose the Freehand Brush Tool
- Left Click and Drag on the Screen roughly



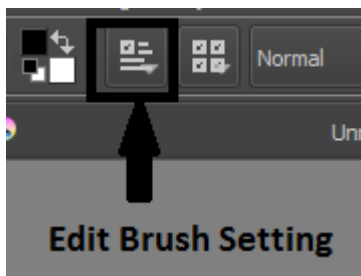
- Change the colour.



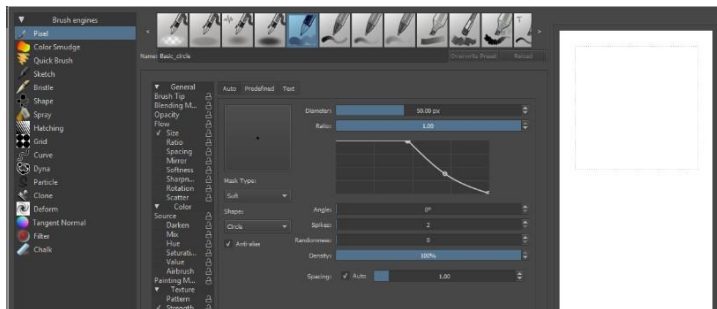
- Change the Upper Colour for drawing with that colour on the screen.

- Left Click and Drag on the Screen

Change the Brush Shape and Size



Click on Edit Brush Setting

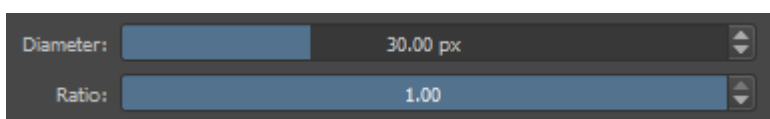


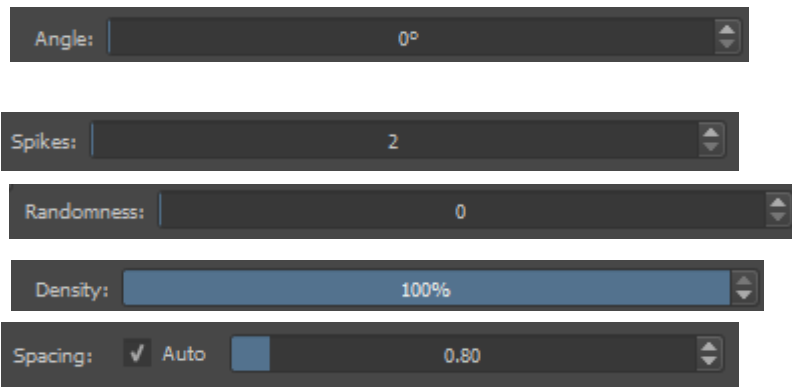
Screenshot

- Select from the pre-defined Brush as above.



Edit Brush Settings





[Screenshot]

- Change the options one by one and create a trial on the white screen which is on the right hand side.
- After choosing the right kind of brush and being satisfied that it is the brush you want for a particular type of effect, click outside and starting drawing on your main board.

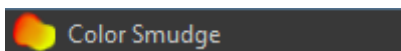
Brush Engines



- Select this in default settings of brushes.
- Choose the Brush



- Left Click and drag on the screen.



- Choose the Brush



- Left Click and Drag on the screen



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen





- Brush



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen





- Choose the Brush



- Left Click and Drag on the screen



- Choose the Brush



- Left Click and Drag on the screen



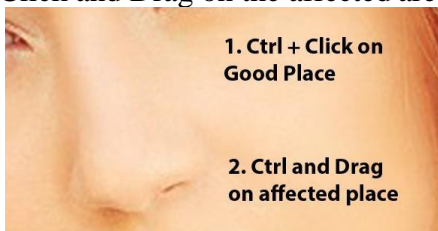
Clone Stamp is used to clean damaged portions of a photograph, cleaning of patches on the faces etc.

- Open a Photo with patches on face.



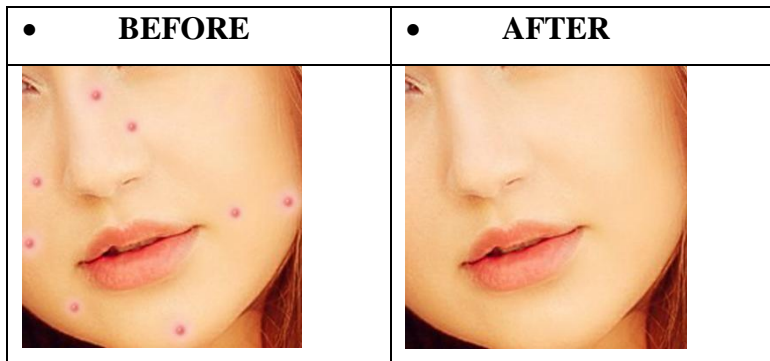
[Screenshot]

- Hold Ctrl and Click on a Good Place
- Click and Drag on the affected area.



[Screenshot]

- You have to Ctrl and click on the place which is similar to the affected area so that the pasted portion completely matches and looks natural.
- A completed cleaning of the above photo is shown.



[Screenshot]



- Create any shape or design on the screen. For i.e. a filled Rectangle Shape



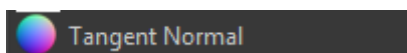
- Choose the Free Hand Tool – Deform Brush



- Choose the desired brush.
- Change the settings one by one and click and drag over the rectangle.



- It will deform the shape as per the click.



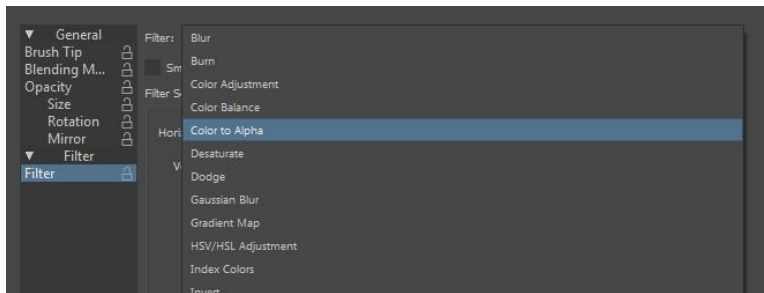
- This tool is used to draw in multiple colours.
- Choose the desired brush.



- Click and drag on screen.



- Open a Photo or Image
- Choose the Freehand Brush Tool – Filter Brush
- Choose the Filter



- Click and drag on the photo to apply the filter on the dragged area.



- Choose the Brush

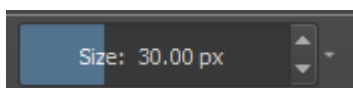


- Left Click and Drag on the screen



Line Tool

- Click and drag on the screen

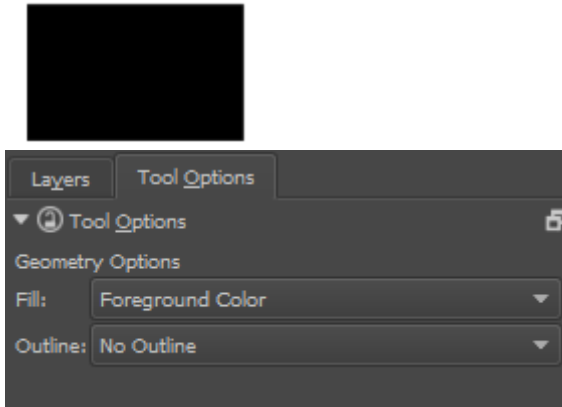


- Change the Size
- Hold Shift and Drag to draw straight lines



▣ Rectangle Tool

- Click and drag on the screen
- Click and drag on the screen + Hold Shift to draw perfect squares.



- Choose from the Tool Options to define Fill and Outline properties.

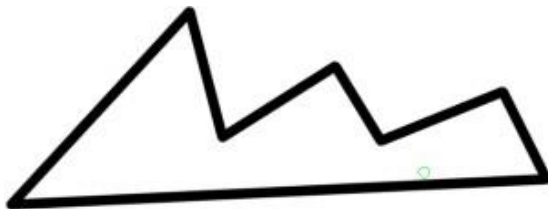
○ Ellipse Tool

- Click and drag on the screen
- Click and drag on the screen + Hold Shift to draw perfect circle.



▣ Polygon Tool

- Left click on the screen on the required end points of the polygon.
- Hold Shift + Click to end the polygon



➤ Polyline Tool

- Left click on the screen on the required end points of the polyline.
- Double click to end the Polyline



Bezier Curve Tool

- Left click on the screen on the required end points of the Bezier Curve.
- Left click and drag to create a smooth edge
- Double click to end the Bezier Curve



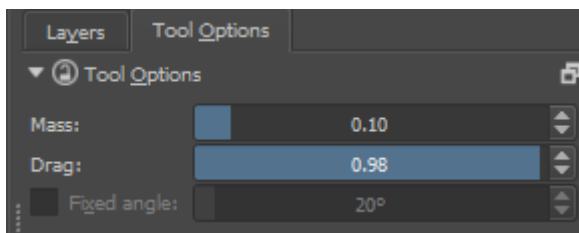
Freehand Path Tool

- Left click and drag on the screen as a freehand paint tool.

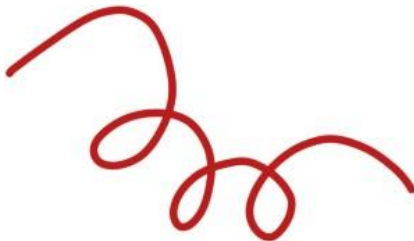


Dynamic Brush Tool

- Tool Options – Increase the Mass to 0.10

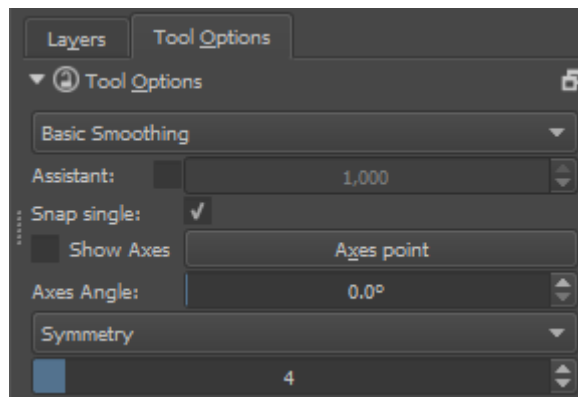


- Click and Drag on the screen



Multi Brush Tool

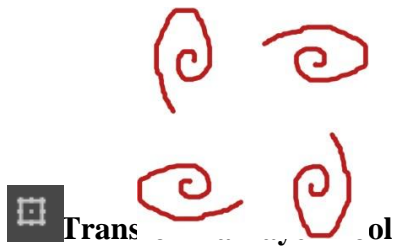
- Choose from the Tool options




[Screenshot]

- Click and Drag on screen

- If you draw once, it will create 4 symmetrical copies



- File – Open – Open a Photo
-  Rectangular Selection Tool



Title: Globe

Attribution: qimono (User name as per pixabay)

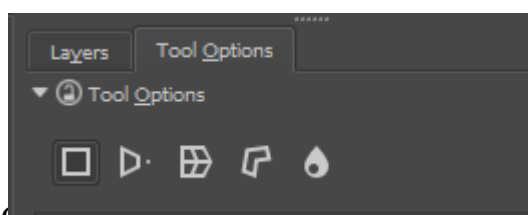
Source: Pixabay

Link: <https://pixabay.com/en/globe-world-earth-planet-1339833/>

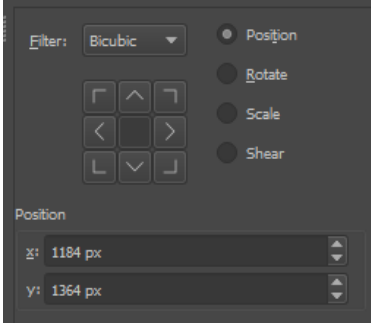
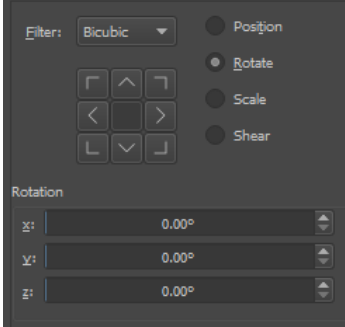
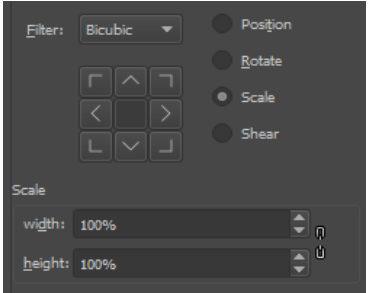
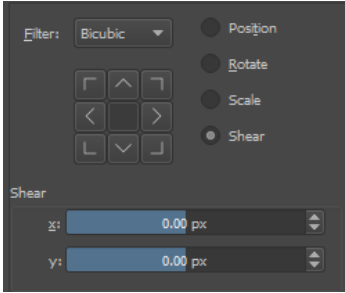
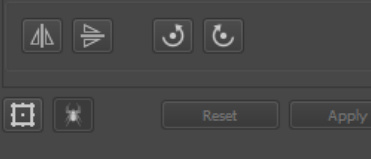
- Select a portion of the photo
- File – New – A4 Size
- Edit – Paste
- Transform a Layer Tool
- Tool Options




- Click and Drag from the corners to adjust the image



- Change the Tool Options as required.

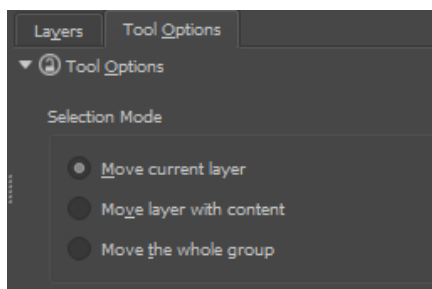
<p>Position Settings</p>  <p>Filter: Bicubic ▾ <input type="radio"/> Position <input type="radio"/> Rotate <input type="radio"/> Scale <input type="radio"/> Shear</p> <p>Position</p> <p>X: 1184 px Y: 1364 px</p>	<p>Rotation Settings</p>  <p>Filter: Bicubic ▾ <input type="radio"/> Position <input type="radio"/> Rotate <input type="radio"/> Scale <input type="radio"/> Shear</p> <p>Rotation</p> <p>X: 0.00° Y: 0.00° Z: 0.00°</p>
<p>Scale Settings</p>  <p>Filter: Bicubic ▾ <input type="radio"/> Position <input type="radio"/> Rotate <input checked="" type="radio"/> Scale <input type="radio"/> Shear</p> <p>Scale</p> <p>width: 100% height: 100%</p>	<p>Shear Settings</p>  <p>Filter: Bicubic ▾ <input type="radio"/> Position <input type="radio"/> Rotate <input type="radio"/> Scale <input checked="" type="radio"/> Shear</p> <p>Shear</p> <p>X: 0.00 px Y: 0.00 px</p>
<p>Mirror Vertical, Mirror Horizontal, Rotate 90 degree CW, Rotate 90 degree CCW</p> 	

 **Move Tool**

- File – Open – Open a Photo
-  Rectangular Selection Tool



- Select a portion of the photo
- File – New – A4 Size
- Edit – Paste
- Move Tool
- Move and Place at the required place.
- Copy and 4 different images from different files in a single file.
- Tool Options



- Move Current Layer – It will move the layer which is selected in the layer list.
- Move layer with content – It will automatically select the layer when the image on the layer is clicked on the drawing screen. We can select any image and move without going to the layer box to select the layer.
- Move the whole group – It will select the total group of the layer selected if any.

Crop Tool

- File – Open

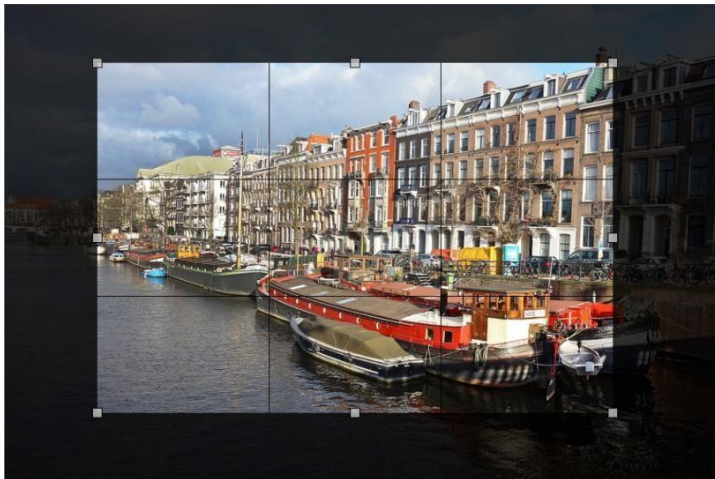


Title: Building

Attribution: Mabelamber (User name as per pixabay) Source: Pixabay

Link: <https://pixabay.com/en/canal-building-boat-city-amsterdam-3047927/>

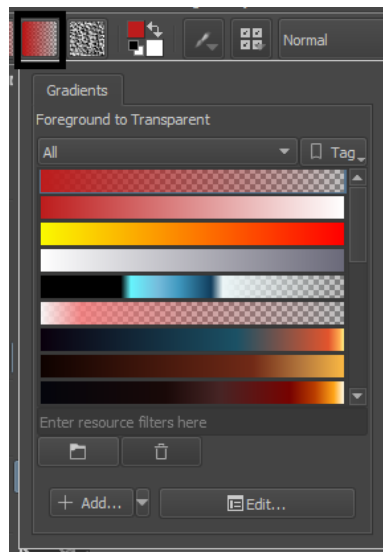
- Crop Tool
- Click and drag on the area you want to keep.



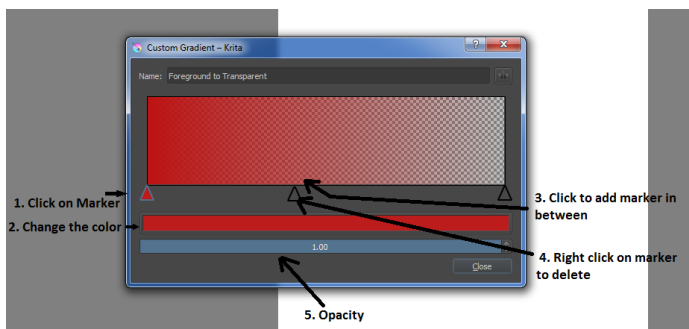
- Press Enter
- It will crop the selected area and delete the remaining part of the image.

Gradient Tool

- File – New – A4 Size
- Gradient Tool
- Choose the Gradient Style –

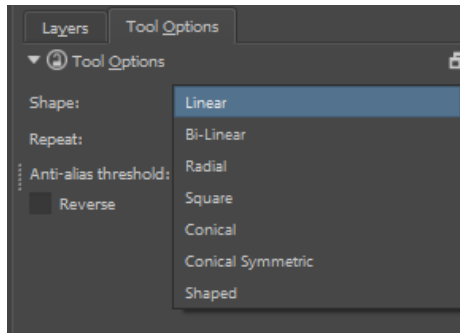


- Click on “Edit”-



- Click on the Marker, Change the Colour

- Click in between to Add Marker
- Right click on the marker to delete.
- Change the opacity as required.
- Tool Options



[Screenshot]

- Change the Shape




Colour Selector Tool

- File – Open
- Choose the Colour Selector Tool
- Click on any colour on the screen.
- The colour will get selected.



Fill Tool

- File – New – A4 Size
-  Rectangular Selection Tool
- Select an area
- Fill Tool
- Choose the colour
- Click on the selected area
- The selected area will fill with the selected colour.

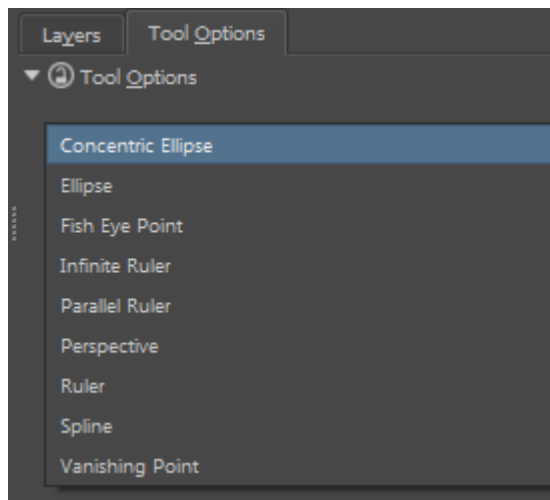


Assistant Tool

- It is used as an Assistant while drawing to know the straight line, perspective, guidelines

etc.

- Tool Options
- Choose the type of assistant needed.

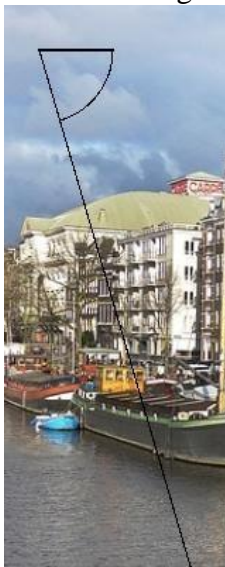


[Screenshot]

- Click and drag on screen
- The displayed design will not appear in the printout. It is for reference purpose only.

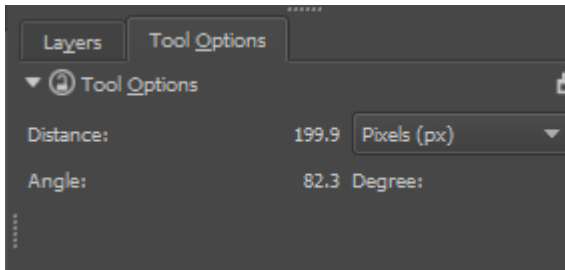
Measure Tool

- It is used to Measure the distance and angle.
- Click and drag on the screen



[Screenshot]

- The output will be displayed in the Tool options.



[Screenshot]

Selection Tools

- Selection Tools are used to select a particular area for the purpose of copying, deleting, filling with colour and moving.

Rectangular Selection Tool

- File – New – A4 Size
- Select an Area

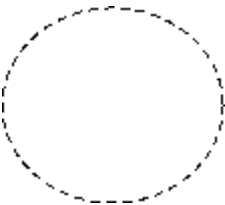


- Shift + Backspace – Fill with Foreground colour



Elliptical Selection Tool

- File – New – A4 Size
- Select an Area



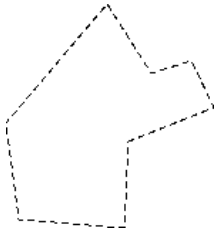
- Shift + Backspace – Fill with Foreground colour



Polygon Selection Tool

- File – New – A4 Size

- Select an Area



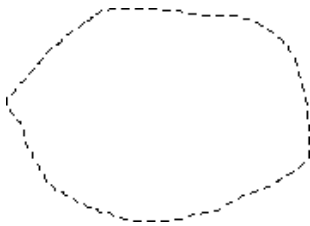
- Shift + Backspace – Fill with Foreground colour



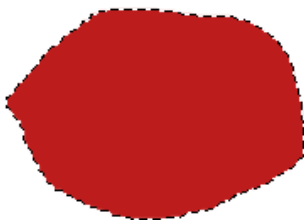
Outline Selection Tool

- File – New – A4 Size

- Select an Area



- Shift + Backspace – Fill with Foreground colour



Contiguous Selection Tool

- File – Open an Image with a flat colour in the background.

Title: Parrot

Attribution: christels (User name as per pixabay)

Source: Pixabay, **Link:** <https://pixabay.com/en/parrot-blue-macaw-fly-bird-wing-2796766/>



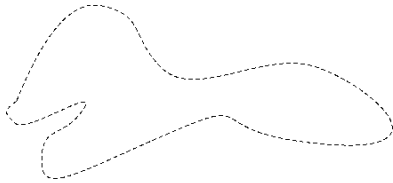
- Contiguous Selection Tool
- Click on the Blue Colour
- It will select the Blue colours all over
- Select Menu – Invert Selection
- Edit – Copy
- File – New – A4 Size
- Edit - Paste

Similar Colour Selection Tool

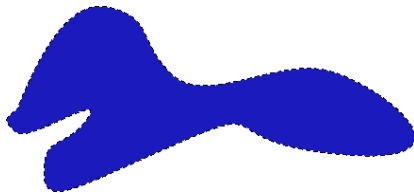
- It will select the similar colours on the screen

Bezier Curve Selection Tool

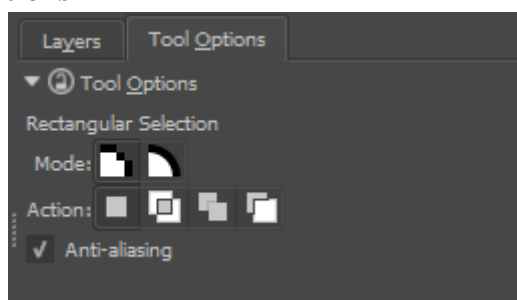
- File – New – A4 Size
- Select an Area





- Shift + Backspace – Fill with Foreground colour

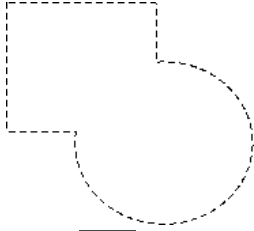


Selection Tool Options





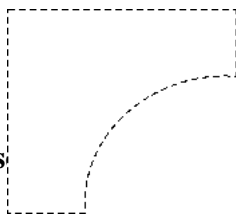
Addition

- File – New – A4 Size
-  Rectangular Selection Tool
- Click and drag on screen
-  Elliptical Selection Tool
- Tool Options – Addition
- Click and Drag on screen





Subtraction

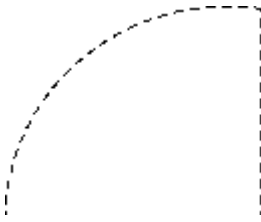
- File – New – A4 Size
-  Rectangular Selection Tool
- Click and drag on screen
-  Elliptical Selection Tool
- Tool Options – Subtraction
- Click and Drag on screen



Inters

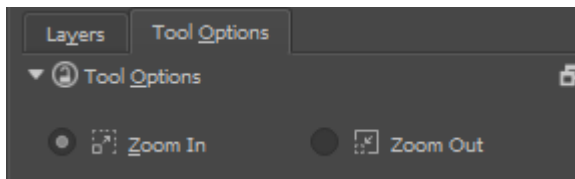
- File – New – A4 Size
-  Rectangular Selection Tool
- Click and drag on screen
-  Elliptical Selection Tool

- Tool Options – Intersection
- Click and Drag on screen



Zoom Tool

- It will zoom the clicked area.
- Scroll the Mouse using Scroll Button



[Screenshot]



Pan Tool

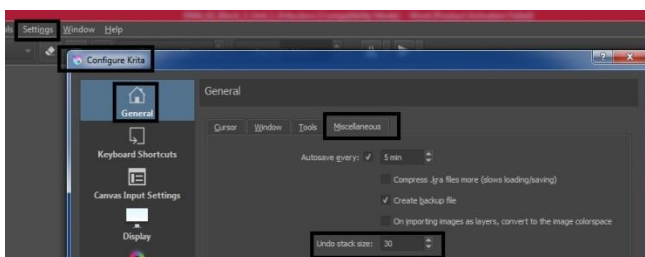
- It will Pan the selected area
- Hold Space Bar and Click and drag on the screen.

Menu Bars of Krita

Edit Menu

Undo

- It is used to undo the command or tool used.
- We can set the number of undo's under Settings – Configure Krita – General – Miscellaneous – Undo Stack Size. By default it is 30 times.



[Screenshot]


- PRACTICAL

- File – New – A4 Size
- Choose a Brush tool
- Click and Drag on the screen 30 times.
- Edit – Undo (Ctrl + Z is the shortcut of Undo)


Redo

- Once the Edit – Undo is done, you can use the Redo immediately to cancel the Undo. It has to be used immediately after doing the Undo. If you do some other work after Undo, then the Redo won't work.
- PRACTICAL
- File – New – A4 Size
- Choose the Brush Tool
- Click and Drag on the Screen One time.
- Edit – Undo [The subject drawn will get erased]
- Edit – Redo [It will bring back the erased subject]
- It will work on most of the tools and commands.

Cut Command – Paste Command

- File – Open a Photo
- Choose any Selection Tool. For i.e.  Rectangular Selection Tool
- Select an area.
- Edit – Cut [It will delete the selected area]
- File – Open Another File
- Edit – Paste [It will paste the cut area here]
- File – New – A4 size
- Edit – Paste [We can paste the cut subject anywhere and as many times as we want]

Copy Command – Paste Command

- File – Open a Photo
- Choose any Selection Tool. For i.e.  Rectangular Selection Tool
- Select an area.
- Edit – Copy [It will copy the selected area]
- File – Open Another File
- Edit – Paste [It will paste the cut area here]
- File – New – A4 size
- Edit – Paste [We can paste the cut subject anywhere and as many times as we want]



Cut (Sharp) – The Process is same as Cut, but the edges will be sharp.

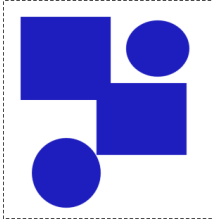
Copy (Sharp) – The Process is same as Copy, but the edges will be sharp.

Copy Merged Command – Paste Command

- File – New – A4 Size
- Create a Filled Rectangle.
- New Layer
- Create another Filled Rectangle.
- New Layer
- Create a Filled Circle.
- New Layer
- Create another Filled Circle.




- 
-  Rectangular Selection Tool
- Select an area covering all the shapes.




- Edit – Copy Merged
- File – New – A4 size
- Edit – Paste
- It will paste all the shapes in a single layer.
- This process is applicable for photos in different layers also.

Paste into New Image

- File – Open a Photo
-  Rectangular Selection Tool
- Select an area
- Edit – Copy
- Edit – Paste into New Image
- It will paste the copied section into a New file.


Clear

- File – Open a Photo
-  Rectangular Selection Tool
- Select an Area
- Edit – Clear
- It will delete the selected area.

Fill with foreground colour

- File – New – A4 Size
- Choose the Foreground Colour



-  Rectangular Selection Tool

- Select an Area



- Edit - Fill with Foreground colour [Shift + Backspace]




Fill with background colour

- File – New – A4 Size



- Choose the Foreground Colour

-  Rectangular Selection Tool

- Select an Area



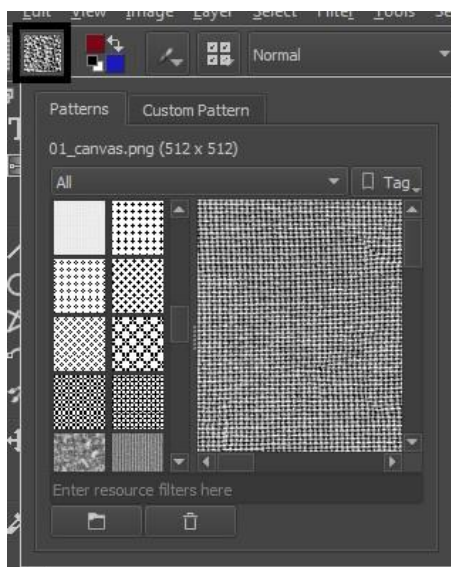
- Edit - Fill with Background colour [Backspace]




Fill with Pattern

- File – New – A4 Size

- Choose the Pattern

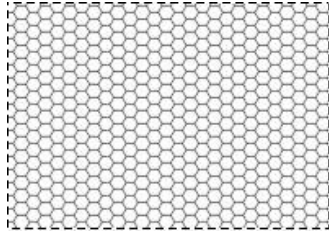


[Screenshot]



-  Rectangular Selection Tool
- Select an Area




- Edit - Fill with Pattern



Stroke Selected Shapes


- File – New – A4 size
- New Layer  Vector Layer
- Create a Rectangle Shape. 
- Click and Drag on screen



- Choose the Path Editing Tool 
- Click on the Rectangle
- Edit – Stroke Selected Shapes
- It will create a new layer with the border of the shape.




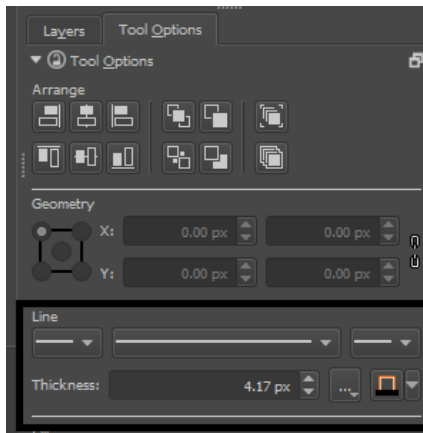
Stroke Selection

- File – New – A4 Size
-  Rectangular Selection Tool

- Select an Area



-  - Shape Manipulation Tool
- Tool Options – Choose the type of stroke wanted.



[Screenshot]

- Edit – Stroke Selection



View Menu

Show Canvas Only [Tab]

It will show the Canvas only in Full View

Full Screen Mode

It will show the Canvas in Full Screen view without any options

Wrap Around Mode

It will continue the subject area like a Tile all around the screen

Instant Preview Mode

It will decrease the memory of high resolution images for the smooth functioning of the software.

Soft Proofing

It is the software setting for soft display of the output.

Out of Gamut Warning

It is the software settings to display warning about the colour contents of the image.

Canvas

Mirror View- It will Mirror the Canvas.

Reset Zoom- It will reset the Zoom to 100%.

Rotate Canvas Right- It will Rotate Canvas to Right by a few degrees.

Rotate Canvas Left- It will Rotate Canvas to Left by a few degrees.

Reset Canvas Rotation- It will Rest the Canvas to its default angle i.e. straight canvas.

Zoom In-It will Zoom in the Canvas.

Zoom Out-It will Zoom out the Canvas.

Show Rulers- It will Show the Rulers on the Screen

Show Guide-

- It will Show the Guides drawn on the Screen.
- File – New – A4 size.
- View Menu – Show Rulers On.
- Click and drag from inside the Ruler to draw a Guide.

Lock Guide

- It will lock the guide which is created.

Show Status Bar

- Status Bar is the Bar which is shown at the bottom which highlights some tips about the tool or option selected.

Show Grid-It will show grid on the screen.

Snap to-While using the Tools and Option it will automatically get snapped or attracted towards the following if selected.

Guides, Grid, Orthogonal, Node, Extension, Intersection, Bounding Box, Image Bounds, Image Center

Show Painting Assistants

- It will show Painting Assistants while drawing which was set using the Assistant Tool

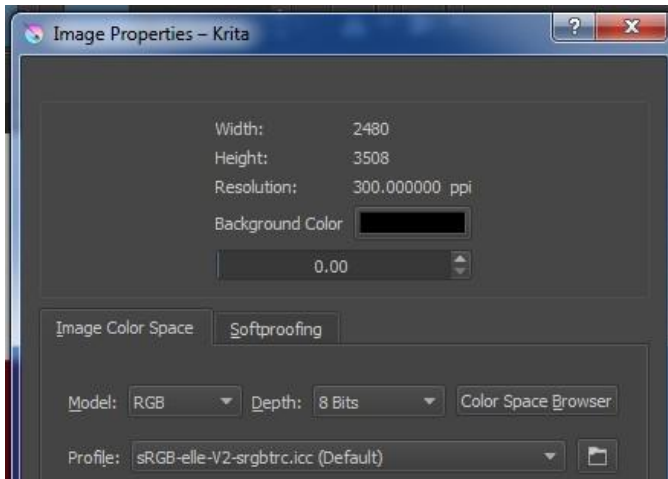
Show Assistant Previews

- It will display the Assistant Preview on the screen when created.

Image Menu

Properties

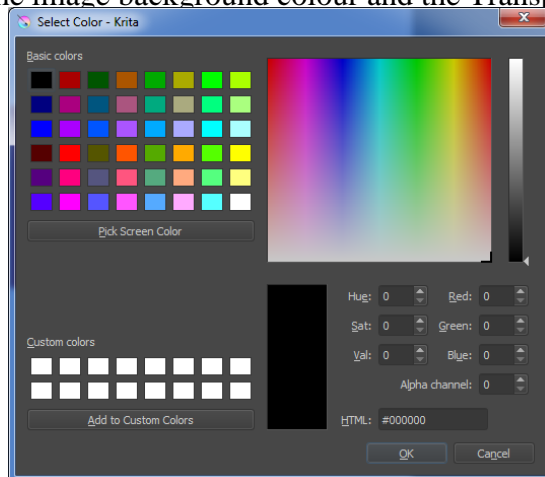
- It will display the properties of the opened and selected file.



[Screenshot]

Image Background colour and Transparency

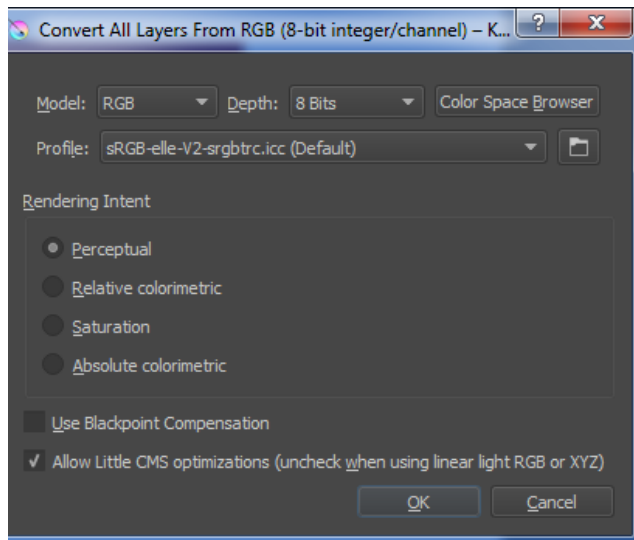
- The image background colour and the Transparency (Alpha) can be set



[Screenshot]

Convert Image Colour Space

- The colour settings of the current file can be changed.



[Screenshot]


Trim to Image Size

- It will Trim all the layers to the Image Size.
- It will delete all the image areas of the layer outside the Image Size.
- It will help in reduction of the file size.

Trim to Current Layer

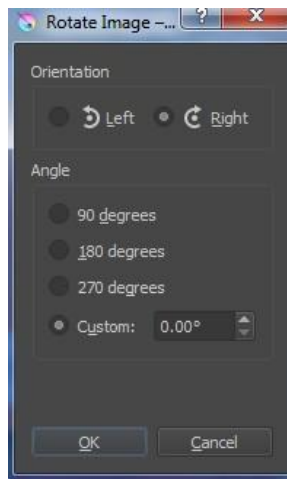
- It will Trim the Image to the Size of the contents of the current layer.

Trim to selection

- File – Open – Open an Image
-  Rectangular Selection Tool
- Select an area
- Image – Trim to Selection
- It will crop the image to the selected area.

Rotate

- File – Open – Open an Image.
- Image – Rotate – [Try the four options as mentioned]



[Screenshot]

Rotate Image

Rotate 90 degree to the Right



Input -

Output -

Title: Building

Attribution: bogitw (User name as per pixabay)

Source: Pixabay

Link: <https://pixabay.com/en/architecture-city-panorama-old-3052486/>

Rotate 90 degree to the Left



Input -

Output -

Rotate Image 180 degrees



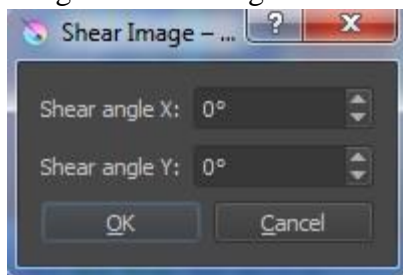
Input-



Output -

Output - Shear Image

- File – Open an Image
- Image – Shear Image



[Screenshot]

Mirror Image Horizontally

It will create a Mirror of the image Horizontally.

Input -



Output –



Mirror Image Vertically

It will create a Mirror of the image Vertically.

Input –

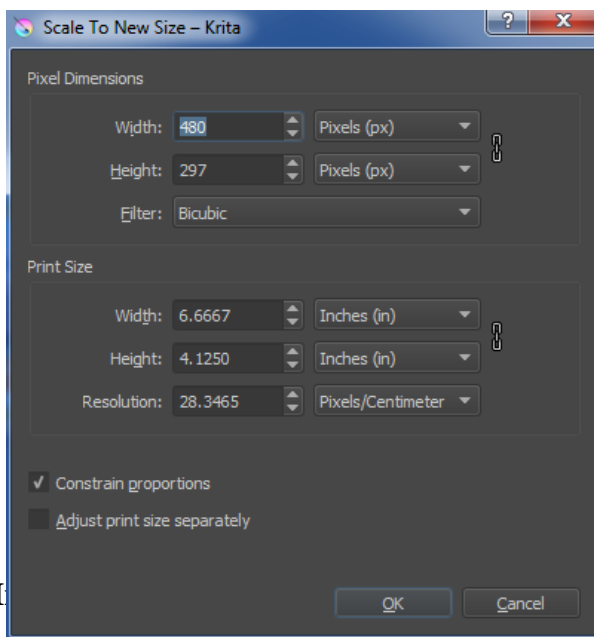




Output –

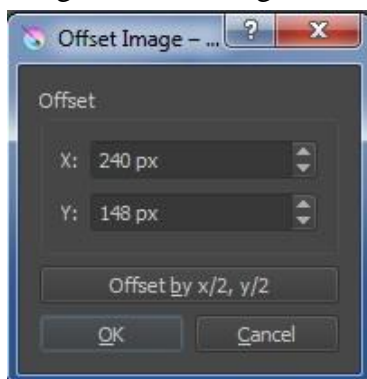
Scale Image to New Size

- File – Open an Image
- Image – Scale Image to New Size
- It will resize the Image according to the dimensions specified by the user.



Offset Image

- File – Open an Image
- Image – Offset Image

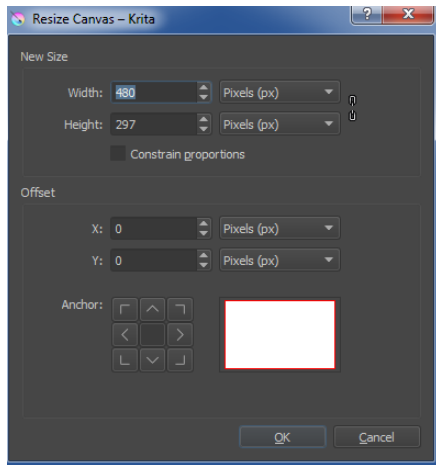


[Screenshot]

- It will offset the image by the numbers specified by the user.

Resize Canvas

- File – Open an Image
- Image – Resize Canvas



[Screenshot]

- It will resize the canvas according to the dimension specified by the user.

Layer Menu

Cut Layer – Paste Layer

- File – Open an Image
- Layer – Cut Layer
- File – New – A4 size
- Layer – Paste Layer

Copy Layer – Paste Layer

- File – Open an Image
- Layer – Copy Layer
- File – New – A4 Size
- Layer – Paste Layer

New

Paint Layer

- File – Open an Image
- Layer – New – Paint Layer
- It will create a new Paint layer

New Layer From Visible


- File – Open an Image.

- Layer – New – New Layer From Visible.
- It will create a new layer from the visible layer.

Duplicate Layer or Mask

- File – Open an Image.
- Layer – New – Duplicate Layer or Mask.
- It will create a duplicate layer of the selected layer.


Cut Selection to New Layer

- File – Open an Image
-  Rectangular Selection Tool
- Select an area



- Layer – New – Cut Selection to New Layer
- It will cut the selection from current layer to New layer

Copy Selection to New Layer

- File – Open an Image
-  Rectangular Selection Tool
- Select an area



- Layer – New – Copy Selection to New Layer
- It will copy the selection from current layer to New layer

Select

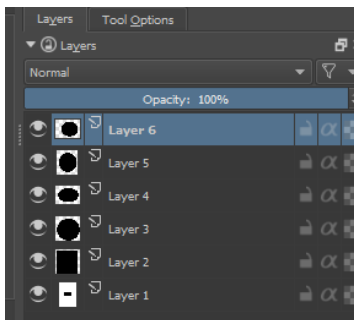
All Layers-It will select all the layers in the file.

Visible Layers -It will select all the Visible Layers in the file. **Invisible Layers**-It will select all the Invisible Layers in the file. **Locked Layers** -It will select all the Locked Layers in the file. **Unlocked Layers**-It will select all the unlocked layers in the file.

Group-

Quick Group

- File – New – A4 Size
- Create a filled rectangle
- New Layer
- Create a filled rectangle again
- New Layer
- Create a filled Ellipse again
- New Layer
- Create another filled Ellipse



[Screenshot]

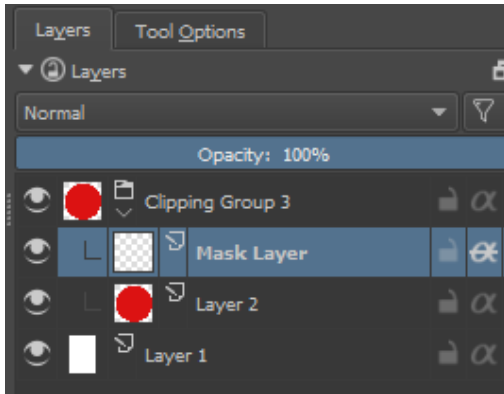
- Select all the Layers. Click on Layer 6
- Hold Shift and Click on Layer 2.
- It will select all the layers.
- Layer – Group – Quick Group

Quick Clipping Group

- File – New File – A4 Size
- New Layer
- Create a filled Ellipse [It is the mask which is created first]



- Layer – Group – Quick Clipping Mask



[Screenshot]

- Create the Shapes. It will be drawn inside the shape mask only.



[Screenshot]

Quick Ungroup

- It will ungroup the selected Group.

<ul style="list-style-type: none"> • Transform • Mirror Layer Horizontally • Mirror Layer Vertically • Scale Layer to new Size • Rotate • Rotate Layer • Rotate 90 degree to the Right • Rotate 90 degree to the Left • Rotate Image 180degrees • Shear Layer • Offset Layer 	<ul style="list-style-type: none"> • File – New – A4 Size • New Layer • Create a filled rectangle or any shape or an Image • Layer – Transform [Use the options in the left hand side one by one]
---	---

Split

Split Layer

- File – Open an Image with flat vector colours from Internet.



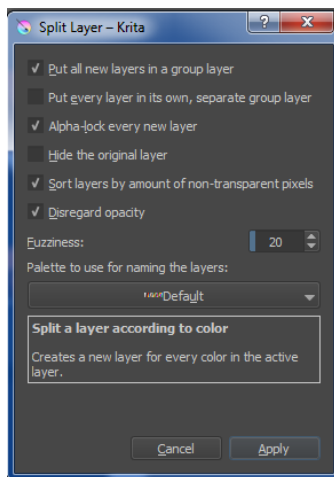
Title: Bee Fun

Attribution: jambulboy (User name as per pixabay)

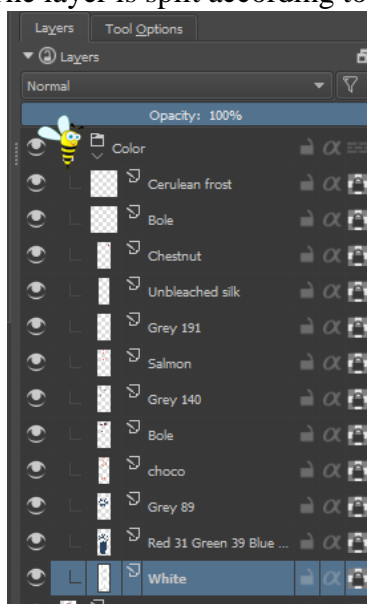
Source: Pixabay

Link: <https://pixabay.com/en/bee-fun-funny-cute-smile-2519766/>

- Layer – Split – Split Layer



The layer is split according to the colours automatically according to the settings.



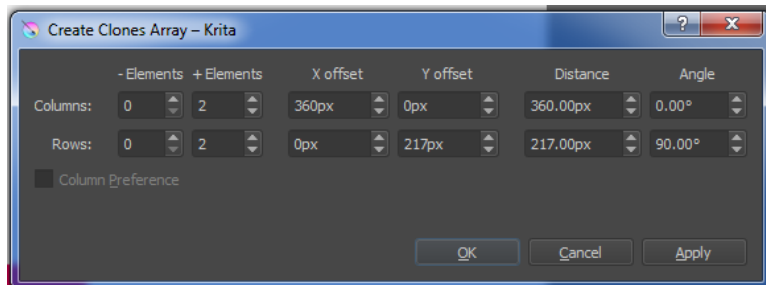
Screenshot

Clones Array

- File – New – A4 Size
- New Layer
- Create a Filled Rectangle



- Layer – Split – Clones Array



[Screenshot]


- Apply




Merge with Layer Below

- File – New – A4 Size
- New Layer
- Create a Filled Rectangle
- New Layer
- Create a Filled Ellipse
- Select both the layers
- Layer – Merge with Layer Below

Flatten Layer

- File – New – A4 Size
- New Vector Layer
- Create a design with Bezier Tool 
- Select the layer
- Layer – Flatten layer

Rasterize Layer

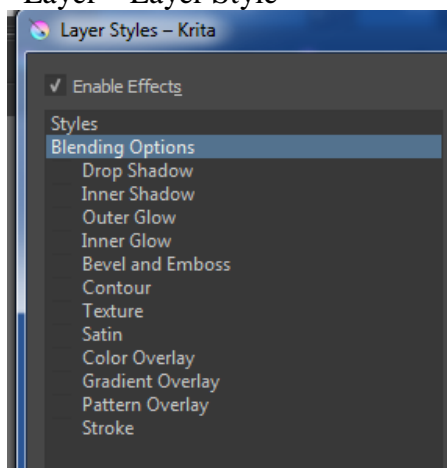
- File – New – A4 Size
- New Vector Layer
- Create a design with Bezier Tool 
- Select the layer
- Layer – Rasterize Layer

Flatten Image

- File – New – A4 Size
- New Layer
- Create a Filled Rectangle
- New Layer
- Create a Filled Ellipse
- Layer – Flatten Image
- It will merge all the layers into one layer.

Layer Style

- File – New – A4 size
- Create a New Layer
- Create a filled rectangle
- Layer – Layer Style



[Screenshot]

- Practice the options one by one-
 - Drop Shadow
 - Inner Shadow

- Outer Glow
- Inner Glow
- Bevel and Emboss
- Contour
- Texture
- Satin
- Colour Overlay
- Gradient Overlay
- Pattern Overlay
- Stroke

Select Menu


Select All- It will select the whole image.

Deselect- It will deselect the selected image.

Reselect- It will again reselect the deselected image.

Invert Selection- It will select the opposite selection of the selected image.


Convert to Shape

- File – New – A4 Size
-  Rectangle Selection Tool
- Select an area
- Selection – Convert to Shape

Display Selection- It will display the Selection

Show Global Selection Mask- It will display the Global Selection mask if any.

Scale

- File – New – A4 Size
-  Rectangle Selection Tool
- Select an area
- Selection – Scale




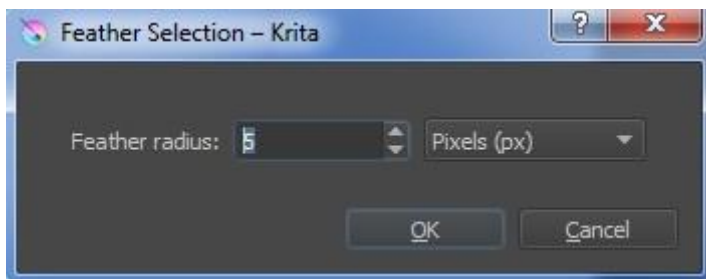
[Screenshot]

Select from Colour Range

- File – Open an Image
- Select – Select from Colour Range
- It will select all the colours in the file of similar range.

Feather Selection

- File – New – A4 Size
-  Rectangle Selection Tool
- Select an area
- Select – Feather Selection. [It will feather and fade the edges]




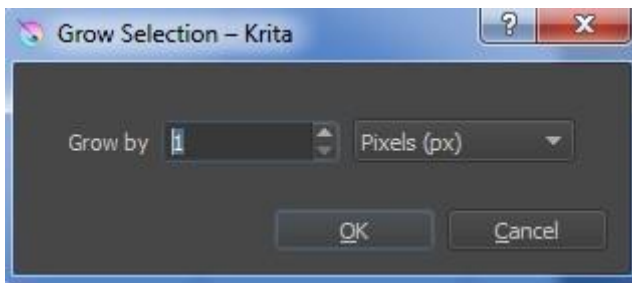
[Screenshot]

- Edit – Fill with Foreground colour.




Grow Selection

- File – New – A4 Size
-  Rectangle Selection Tool
- Select an area
- Selection – Grow Selection



[Screenshot]


Shrink Selection

- File – New – A4 Size
-  Rectangle Selection Tool
- Select an area
- Selection – Shrink Selection



[Screenshot]


Border Selection

- File – New – A4 Size
-  Rectangle Selection Tool
- Select an area
- Selection – Border Selection



Smooth

- File – New – A4 Size

-  Rectangle Selection Tool
- Select an area
- Select – Smooth

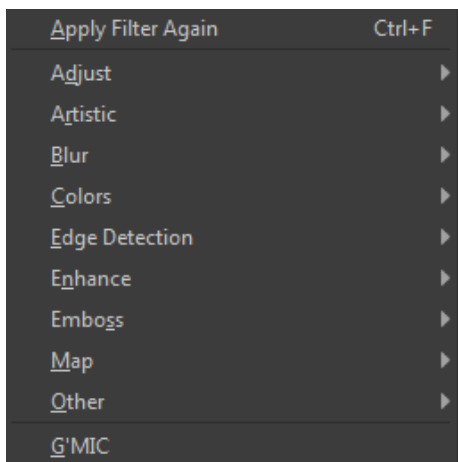
Filter Menu

- File – Open an Image



[Screenshot]

- Filter Menu – Try all the filters one by one as specified in the software.



[Screenshot]

Summary

In this Unit we have described about the tools and features of Krita. After using the tools and menu bar options you can create designs according to requirement. In the practical world of design, only a few percent of the options of software is used extensively and a major portion of tools and options are used occasionally on requirement only.

Assignments

- Practice all the tools taught in the Unit and save each and every file.
- Write (Process of copying the softcopy into CD/DVD) all the above Assignments in DVD using Nero software with the video output, raw source files of the software used

and submit it to the University.

Assessment

- Krita is an _____ source software used for _____.
- Write down any three categories of Image Processing.
- Write down any five categories of Design works.
- Write down any five job prospects after learning Krita.
- Which tool is used for cleaning spots on a face?
- What is transparency called in Krita?

Resources

Krita Learning Tutorials

https://docs.krita.org/Category:Getting_Started

<https://dev.krita.org/en/learn/tutorials/>

<http://white-heron.deviantart.com/art/Krita-tutorial-Basics-325962811>

<http://www.davidrevoy.com/article185/tutorial-getting-started-with-krita-1-3-bw-portrait>

Unit 2 Familiarization to Inkscape

Introduction

Learning to create a design goes through the process of Digital Technology and the software's related with it. If you want to be a good designer you have to effectively use the tools and techniques provided by the software. Now-a-days software's have lots of in-built capabilities which make the manual work easier and perfect. Options like Alignment, Colour settings, Geometrical shapes etc. are already there in the software which we can use at a single click. These works used to take lots of time and gives stress to the designer for bringing perfection when done manually. It was an Art when the design was done manually, but when it comes to the digital, the same thing becomes a Science.

Inkscape is an open source Vector based software used for designing. It has got almost all the capabilities of commercial software available in the market. With the knowledge of Inkscape one can create visiting cards, posters, hoardings, advertisement materials, books cover designs etc.

After learning the Inkscape, digital software, the designer has a variety of choices he can use to immediately create outputs and choose the best out of them. Human being has to just have the knowledge of using software's to create Designs.

Outcomes

Upon completion of this unit you will be able to:

- *Use* the tools of Inkscape.
- *Create* designs using the tools and menus.
- *Select* the import and export options of the software.

Terminology

Vector: Vector designs are created using software's which has the capability to expand without any pixel distortion.

Import: If we want to bring some design made in different software's together in single software, we need to Import the file if the format of the file is supported.

Export: If we want that the file which we are currently working to be used in some other software, then we have to Export the file in the format

supported by other software's.

A Brief History of Designing

Tools of Inkscape

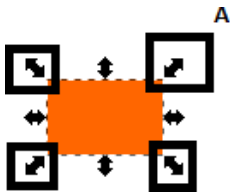


Select and Transform Objects

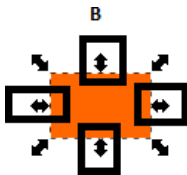
- Create a Rectangle



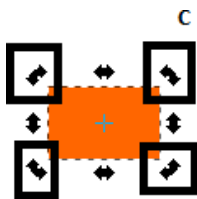
- Choose the tool



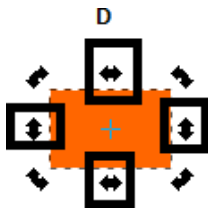
- Click on the corners named “A” for uniform scaling from all sides.



- Click on the corners named “B” for non-uniform scaling from all sides.
- Click on the Rectangle again. The corner adjustment symbols will change as follows.




- Click on the corners named “C” for Rotation of the subject




- Click on the corners named “D” for skewing the subject.
- Moving the Object – Click from the middle of the shape and move the object.

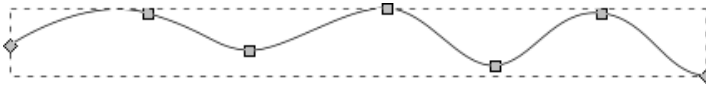


Edit Path by Nodes

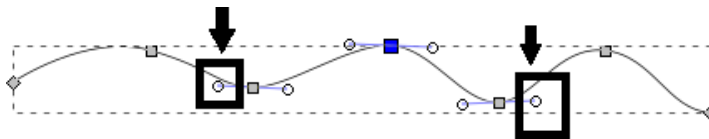
- Choose the tool  "Draw Bezier curves & Straight lines"
- Create a curve drawing with 5 to 6 nodes (or clicks)




- Choose the tool - 



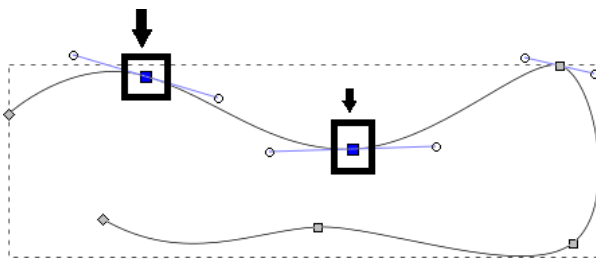
- Click on the square points to move the nodes




- Click on the tangent to adjust the smoothness of the curve

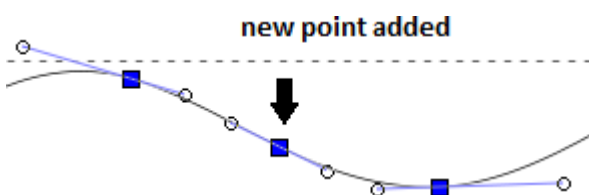
-  Insert new nodes into selected segments

- Select two or three nodes in between by click and drag over the nodes.



- Click on 

- Output will be as follows



-  Delete Selected Nodes

- Select the nodes you want to delete

- Click on 

-  Join Selected Nodes

- Select two or three nodes in between

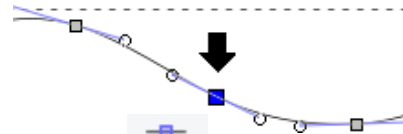
- Click on 

- The selected nodes will join together in their selected center

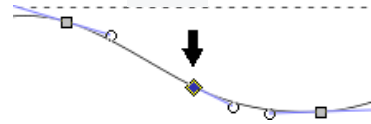


- **Break path at selected Nodes**

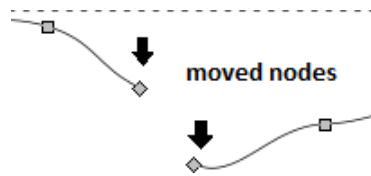
- Select a single node in between



- Click on



- Click outside
- Click on the node and move

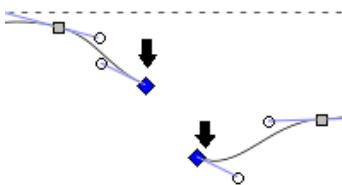


- You will find two nodes one over the other which are broken
- Move and place as required



- **Join Selected end nodes with a new segment**

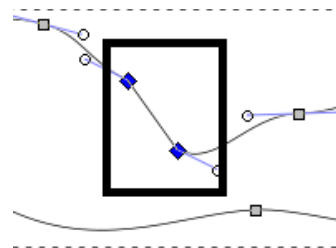
- Select two open end point nodes.



- Click on

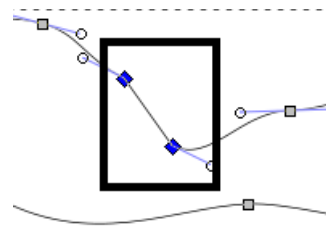



- Output will be as follows

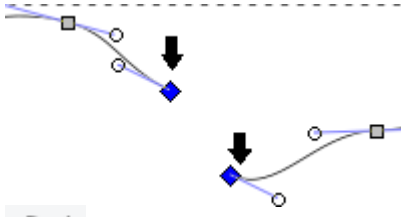



- **Delete segment between two non-end point nodes**

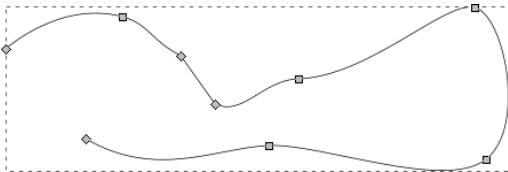
- Select two non end point nodes




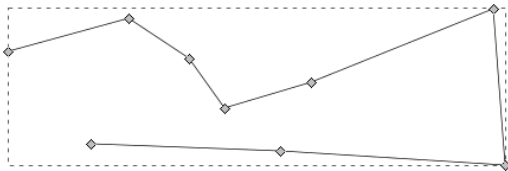
- Click on 
- Output will be as follows




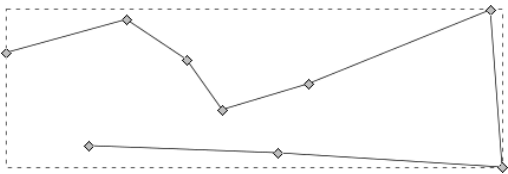
-  **Make selected nodes corner**
- Select nodes with smooth corner




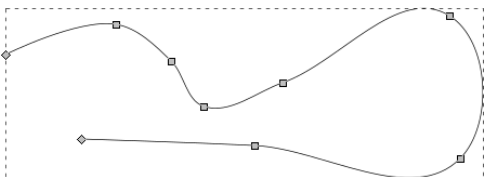
- Click on 




-  **Make selected nodes smooth**
- Select nodes with pointed corners



- Click on 




-  **Make selected nodes symmetric**
- Select some smooth nodes

- Click on 

- The selected handles or tangents of the nodes will get symmetric.

-  **Make Selected Nodes Auto smooth**

- Select node or nodes in between

- Click on 
- The selected nodes will become smooth as per the default settings of the PC

-  Make **Selected** Segments Lines

- Select node or nodes in between

- Click on 

- The Selected segments in between the nodes will become straight lines

-  **Make Selected Segments Curves**

- Select node or nodes in between

- Click on 

- The Selected segments in between the nodes will become curves

-  **Convert Selected object to path**

- Create a Rectangle using Rectangle tool



- Click on 

- Move the nodes as required



- You can use Circle Tool, Polygon tool etc. in this option to move their individual nodes as per your requirement.

-  **Convert Selected object stroke to path**

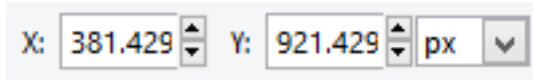
- Create a rectangle with stroke thickness of 20



- Click on 



- You will get nodes all over the rectangle as a fill identity instead of stroke identity.



- Select node or nodes.
- Change the position coordinates of x and y in the box.
- The nodes will move as per the coordinates.

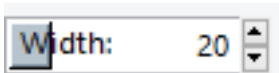


Tweak Objects by sculpting or painting

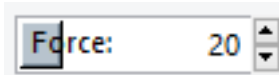
- Create any shape using any tool



- Choose
- Change the settings of the tool one by one and click and drag on the screen over the shape



- It is the width of the tool which will affect the brush area only.



- It is the force of the brush which will drag the shape to the pixels as described in the force.



- Use the pressure of the input device to alter the force of tweak action.

- Mode:



- Move Objects in any direction.



- Move Objects towards cursor, with shift from cursor











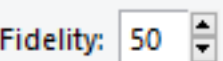
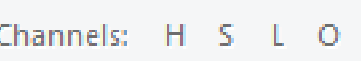
- Move objects in random directions



- Shrink objects, with shift enlarge



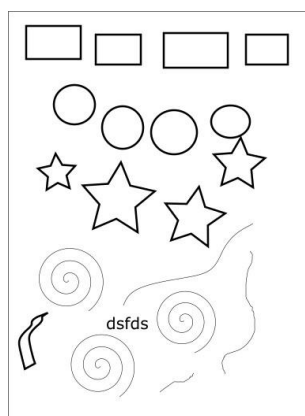
- Rotate objects, with shift counter clock wise

-  Duplicate objects, with shift delete
-  Push parts of paths in any direction
-  Shrink (inset) parts of path, with shift grow (outset)
-  Attract parts of paths towards cursor, with shift from cursor
-  Roughen parts of the paths
-  Paints the tools colour upon selected object
-  Jitter the colours of selected objects
-  Blur selected objects more, with Shift, blur less
-  Fidelity: 50 Fidelity is the level of blur.
-  Channels: H S L O It is the colour channels














Zoom In or Zoom Out

- Create a New File
- Draw shapes all over the screen



[Screenshot]

- Practice the zoom options one by one. The name of the zoom options itself describes the output. The shortcut of the tool is mentioned in square brackets.

-  Zoom in [+]
-  Zoom out [-]
-  Zoom to 1:1 [1]
-  Zoom to 1:2 [2]
-  Zoom to 2:1
-  Zoom to fit selection in window [3]
-  Zoom to fit drawings in window [4]
-  Zoom to fit page in window [5]
-  Zoom to fit page width in window [6]
-  Preview Zoom (from the history of zooms) [`]
-  Next Zoom (from the history of zooms) [Shift + `]

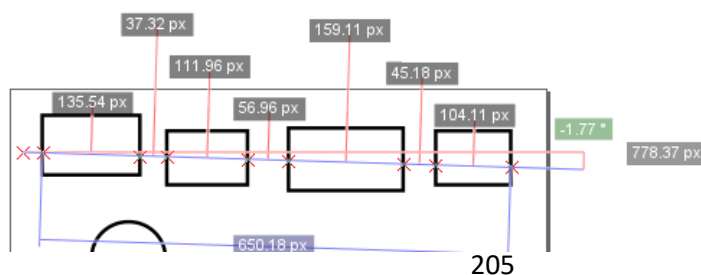


Measurement Tool

- Click and drag on the screen
- It is used to measure distance while drawing
- This is a temporary scale and is for information only
- The design and text shown will vanish after the tool is deselected
- It will not appear in printout



- For visibility purpose the font size may be increased or decreased as per self-convenience.
- If the measurement line passes over object will also show the measure of its segments.







Create Rectangle and Squares

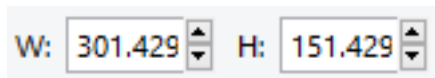
- Click and drag on the screen



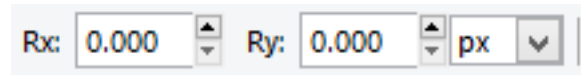
- Setting fill colour – Click on the colour as required from the colour screen



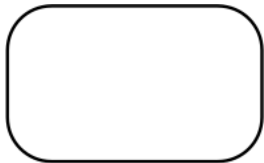
- Setting stroke colour – Right click on the colour and click on “Set stroke”
- Remove fill colour – Click on  [cross symbol] in the colour palette
- Remove stroke colour – Right click on  [cross symbol] in the colour palette and click on “Set stroke”




- Change the width and height of the rectangle



- Change the roundness of the rectangle

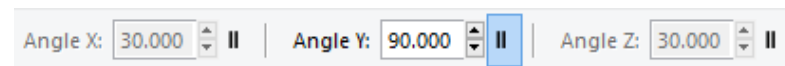
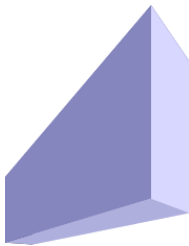


-  Make corners sharp




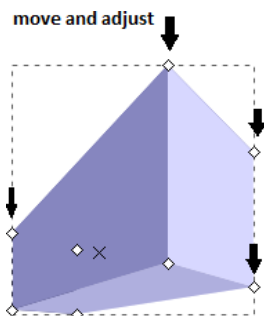
Create 3D Boxes

- Click and drag on the screen



- Change the above settings as required for modification

- Choose the  Tool
move and adjust



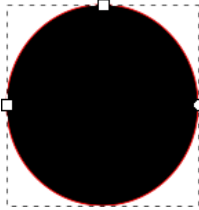
[Screenshot]

- You can move the node points and adjust the 3D shape




Create Circle, Ellipse and Arcs

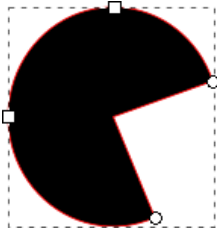
- Click and drag on screen



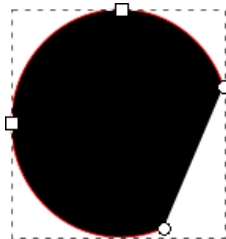
Start: End:


-  Switch to segment (closed shape with two radii)

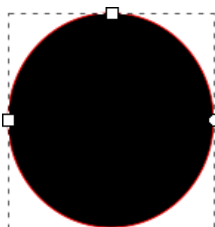
Start: End:




-  Switch to Arc (unclosed shape)




-  Make the shape a whole ellipse, not arc or segment



Create Stars and Polygons




- 
- Click and Drag on the screen for Polygon

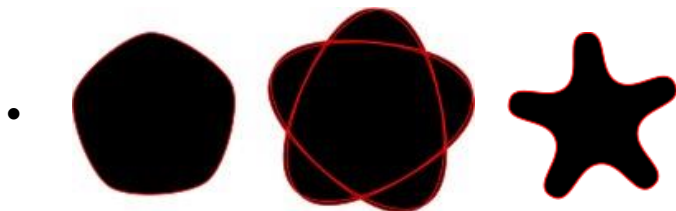



- 
- Click and drag on the screen for star




- Change the options to view the changes

- **Corners:** 
- **Spoke ratio:** 
- **Rounded:** 



- **Randomized:** 

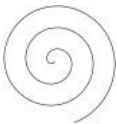



-  Reset shape parameter to default – This will set all the options as it was in the beginning.




Create Spirals

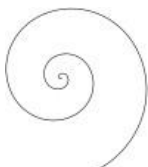
- Click and drag on the screen



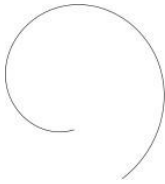
- **Turns:**  You can increase or decrease the number of turns.




- **Divergence:**  The proportion of the gap in between the turns will be unequal.



- **Inner radius:** 0.000 We can specify the amount of spiral as required from its corners.

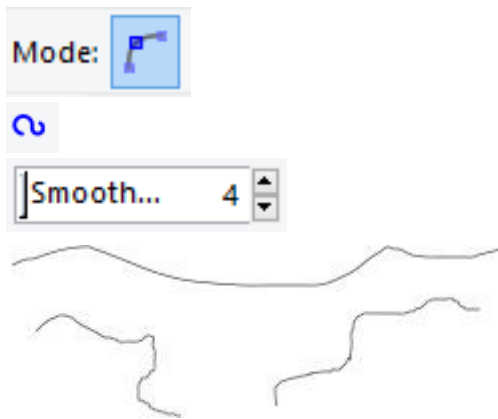



-  Reset shape parameters to default.

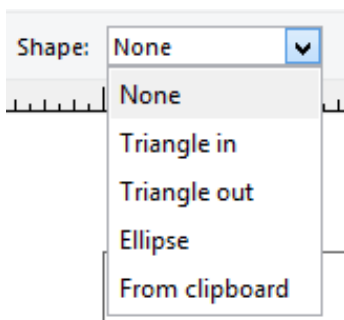


Draw Freehand lines

- Click and drag on the screen to create freehand lines with the settings as required

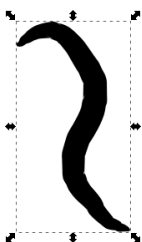



-  Reset shape parameters to default



[Screenshot]

- The settings of the shapes can be defined from the shape option.
- Choose Ellipse and draw

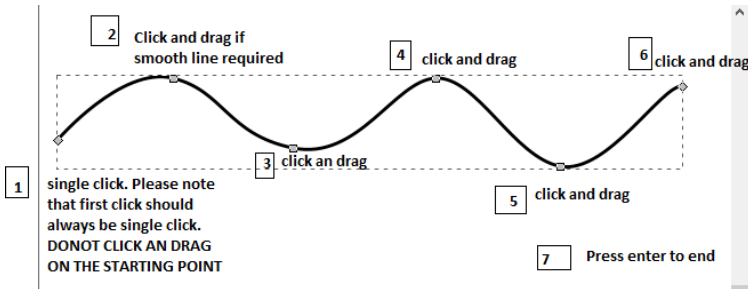


- Choose the  Tool
- Move and adjust the nodes as required.

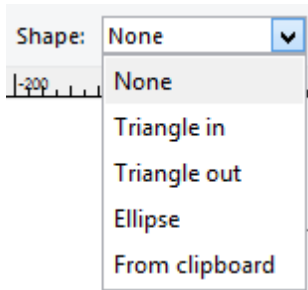



Draw Bezier curves & Straight lines

- Click and drag on screen to draw with the defined settings.



[Screenshot]

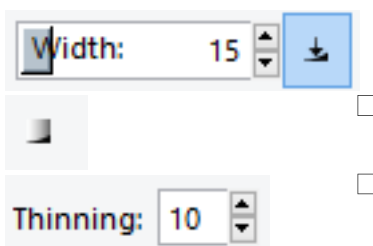


- Choose the  Tool
- Move and adjust the nodes as required.



Draw Calligraphic or brush strokes

- Click and drag on the screen with defined settings.





Angle: 30

Fixation: 90

Caps: 0.00

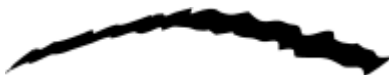
Tremor: 0



Wiggle: 0



Mass: 2



Create and Edit Text Objects

- Click on the screen to type text

Inkscape tutorial for
Odisha State Open
University

sans-serif

- Change the font (style of text or typography) as required

4

- Change the font size as required

Normal

- Choose Normal, Italic, Bold or Bold Italic

- Type a paragraph with 4 or 5 lines. Practice the Alignment options.



- Alignment Left

-  Alignment Center

-  Alignment Right

-  Alignment Justify

-  **Superscript**

- Click on the Text Tool

- Type $a^2 + b^2$

- Select 2 only

- Click on 

- Output $a^2 + b^2$

-  **Subscript**

- Click on the Text Tool

- Type H₂O

- Select 2 only

- Click on 

- Output H₂O

-  Spacing between lines


-  Spacing between letters

-  Spacing between words

-  Horizontal kerning

-  Vertical Shift

-  Character Rotation

-  Horizontal Text-The text will be displayed in Horizontal form.



- Vertical Text-The text will be displayed in Vertical form.

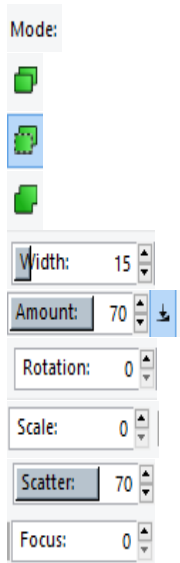


Spray objects by sculpting or painting

- Create a Star
- Keep the Star in selection
- Choose the Spray Tool
- Click and drag on screen with the defined settings.



- Change the settings as required and click and drag on the screen as many times as desired.



Erase existing paths

- Create a rectangle or any shape





- Choose the



- Click and drag over the rectangle on the areas which you want to erase.

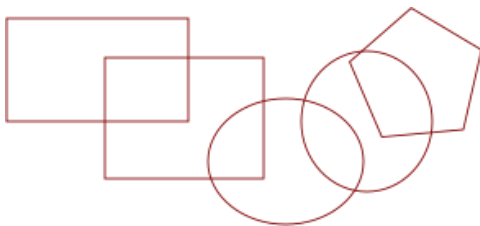



- **Mode:**
-  Delete objects touched by eraser
-  Cut-out from objects
- **Width:** 10

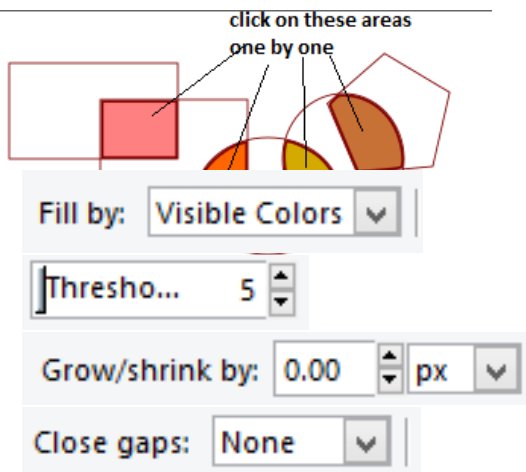


Fill bounded Areas

- Create Rectangle, Circle, Polygon and other shapes with no fill and black outline.
- The shapes need to overlapping as shown



- Click on the  Tool
- Click on the intersecting areas.
- A new shape will be generated
- Fill it with colour.






Create and Edit Gradients

- Create a Rectangle or any shape.



- Click on  Tool
- Click and drag inside the rectangle




- Change the options one by one view the changes.

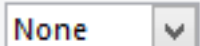

-  Create Linear Gradient

-  Create Radial Gradient

-  Select:  4178 


- Link gradients to change all related gradients.

-  Reverse the direction of the gradient.

- Repeat:  None 

- Stops:  stop4182 

- Offset:  1.00

-  Insert New Stop – It will add a new colour marker.

- Click on the color marker



- Click on the color as required in that place of the marker.

- 

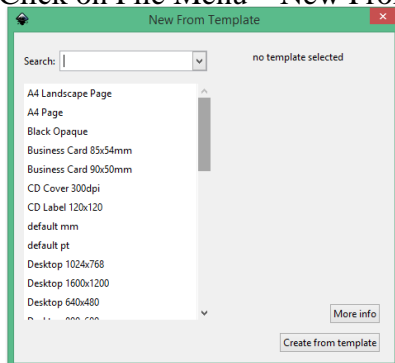
File Menu

New

- Click on File Menu – New.
- It will create a new file for making the design.

New from Template

- Click on File Menu – New From Template

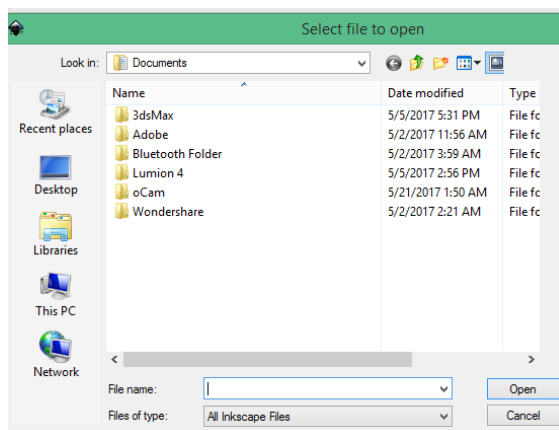


[Screenshot]

- Choose the setting as required from the template

Open

- Click on File Menu – Open
- Choose the file to open from the saved list of folders.



[Screenshot]

Open Recent

- Go to File Menu – Open Recent
- Choose the recently done file from the list of files

Revert

- Go to File Menu – New
- Create Some designs



[Screenshot]

- Go to File Menu – Save – [Give a name for i.e. trial1]
- Now do some modification in design or add a few more design.



[Screenshot]

- Go to File Menu – Revert
- It will bring back to the position of the file when it was saved earlier.
- It will revert back the changes to the last saved file and save the time of continuous undo in a single click.

Save

- Go to File Menu – click on New
- Create some designs
- Go to File Menu – Save
- Choose a folder and a file name to save the created design.

Save as

- Go to File Menu – click on New
- Create some designs
- Go to File Menu – Save
- Choose a folder and a file name (a1) to save the created design.
- Do some modification or create some extra design.
- Go to File Menu – Save As
- Choose another file name (a2) to save.

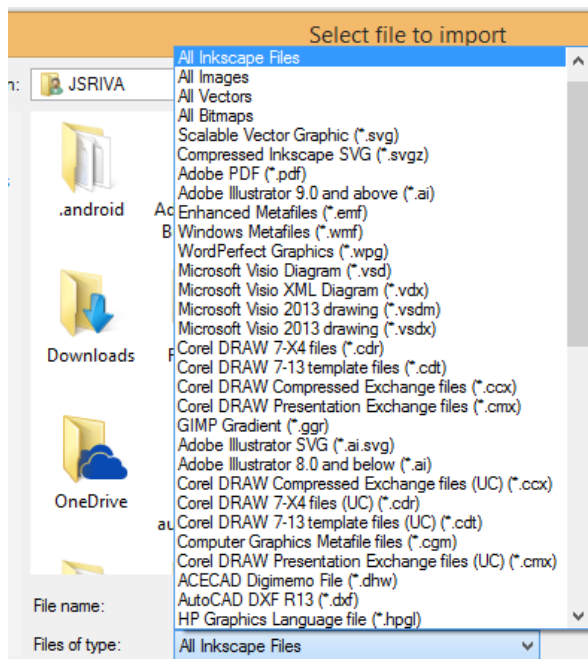
- Now, there will be two version of the file. One which was saved in one name (a1) and the other which was saved in another name (a2).
- The current open file is a1.

Save a Copy

- Go to File Menu – click on New
- Create some designs
- Go to File Menu – Save
- Choose a folder and a file name (b1) to save the created design.
- Do some modification or create some extra design.
- Go to File Menu – Save A Copy
- Choose another file name (b2) to save.
- Now, there will be two version of the file. One which was saved in one name (b1) and the other which was saved in another name (b2).
- But, the file which is currently open will be “b1” WHICH DIFFERENTIATES it from “Save As”

Import

- Go to File – Import

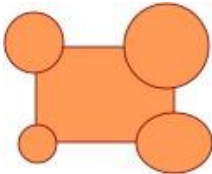


[Screenshot]

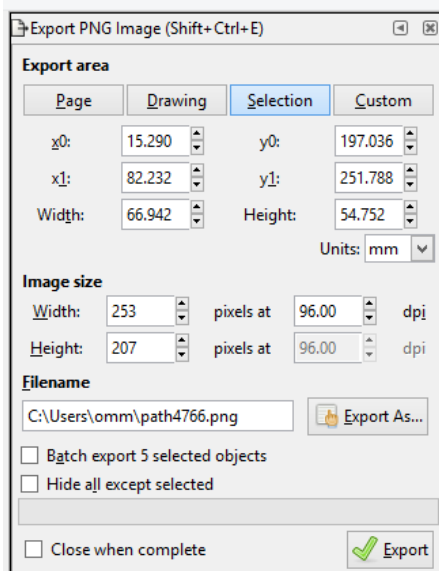
- We can import files from the works done on other software's similar to Inkscape like Coreldraw, AutoCAD, and Illustrator etc.

Export PNG Image

- PNG Image is a file which can maintain the transparency in the edges so that it can be easily pasted over another image with transparency.
- Go to File – New
- Create a Design



- Select all the design
- Go to File – Export PNG Image –

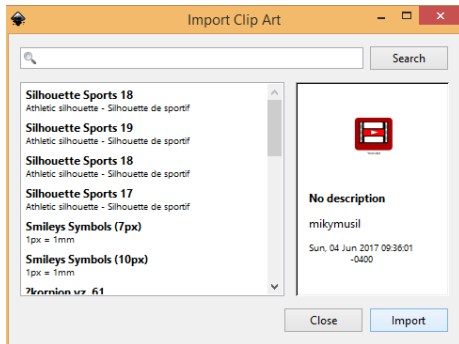


[Screenshot]

- Set the Settings as required. In this case choose “Selection”
- Choose the folder and file name to save –
- Click Export.

Import Clip Art

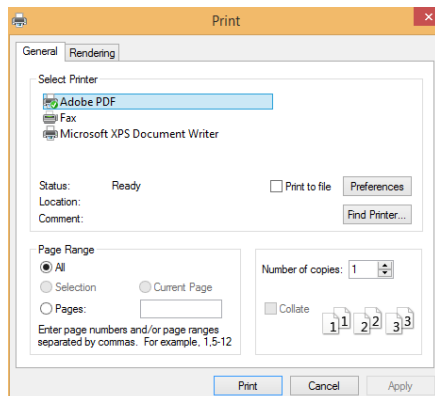
- Go to File – Import Clip Art
- Click on Search
- If there are any clip arts loaded in the system, then it will appear.



[Screenshot]

Print

- Go to File – New from Template
- Choose A4 Size document
- Create a design
- Go to File – Print
- Set the settings as per your printer
- Print



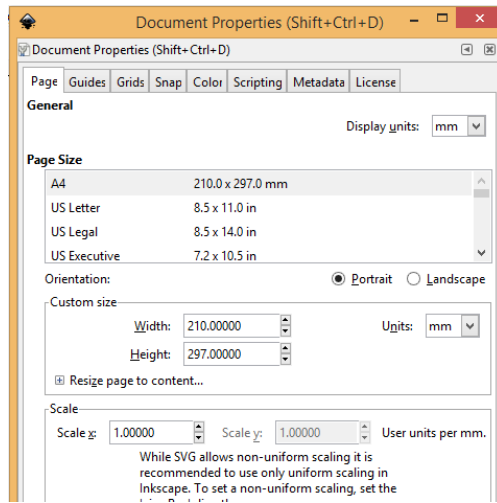
[Screenshot]

Clean-up Document

- When we create a design, we use lots of options, undo's etc. which are stored in the temporary memory which becomes a part of the file size.
- Hence, after completion of the total design, it is suggested to click on File – Clean-up Document
- After that click on File – Save
- It will save the cleaned file without unnecessary and unused definitions.

Document properties

- Go to File – Document Properties



[Screenshot]

- It will display all the properties of the document which we can change according to our requirement like Page Size, Guides, Grids, Snap, Colour etc.

Close

- Go to File – New
- Create a Design
- File – Save [Give a name to save]
- Go to File – Close
- It will close the opened file, but not the software.

Quit

- Go to File – Quit
- It will close the software. Before closing if there are any unsaved open files, it will ask the option to Close without Saving or Close with Saving.

Edit Menu

Undo

- Create 4 to 5 shapes or use any options.
- Go to Edit – Undo
- The shortcut of Edit – Undo is (Ctrl + Z)

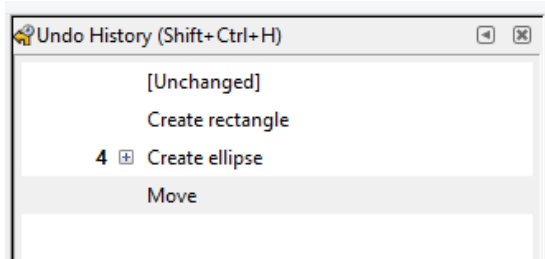
Redo

- In case you have done undo wrongly, then you can immediately click “Edit – Redo” to get back.

- This has to be done immediately else it will not work. It will work for the immediate previously used options only.

Undo History

- In case you want to undo more than 1 time, then you can choose undo history.
- It will appear on the right hand side screen of the software.



Cut Command+ Paste Command

- File – New
- Create a Rectangle or any shape
- Select the shapes using Tool
- Edit – Cut
- It will cut the selected shape into the memory of the computer. The selected shape will get deleted.
- File – New
- Edit – Paste
- The cut subject will get pasted here.
- File – New
- Edit – paste

Digital Imaging 97

- The cut subject can be pasted as many times as wanted.
- Move the subject
- Edit – Paste
- The subject can be pasted as many times in the same file also.

Copy Command + Paste Command

- File – New
- Create a Rectangle or any shape
- Select the shapes using Tool
- Edit – Copy
- It will copy the selected shape into the memory of the computer. The selected shape will not get deleted.
- File – New
- Edit – Paste
- The cut subject will get pasted here.
- File – New
- Edit – paste
- The cut subject can be pasted as many times as wanted.
- Move the subject
- Edit – Paste
- The subject can be pasted as many times in the same file also.

Copy Command + Paste in Place Command

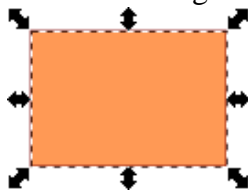
- File – New
- Create a Rectangle or any shape
- Select the shapes using Tool
- Edit – Copy
- It will copy the selected shape into the memory of the computer. The selected shape will not get deleted.
- File – New
- Edit – Paste in Paste
- The copied shape will get pasted in the same place from where it was copied in the previous file.

Copy Command + Paste Style Command Unit 2 Familiarization to Inkscape 98

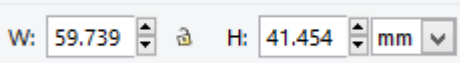
- File – New
- Create a Rectangle [any shape]
- Set a Fill Colour
- Set a Stroke Colour
- Set the Stroke width to 3
- Select the Rectangle
- Edit – Copy
- Create a Circle [any shape]
- Now, the purpose is to copy all the properties of Rectangle to Circle i.e. Fill colour, stroke colour, stroke width etc.
- Select Circle
- Edit – Paste Style
- It will paste the properties of the Rectangle onto Circle. We don't have to set the properties of new shapes again.

Copy Command + Paste Size Command

- Create a Rectangle



- Note the width and height.

-  W: 59.739 H: 41.454 mm

- Select the Rectangle
- Edit – Copy
- New File
- Create another Rectangle

- Edit – Paste Size – Paste Size
- The selected rectangle will get the properties of the size of the copied rectangle in the previous file.
- Create a Circle
- Select the Circle
- Edit – Paste Size – Paste Size
- The width and height of the circle will also become the same as of the copied rectangle.
- This is essential for designing purpose where the properties of one drawing need to be same as another drawing. It will be time taking to note the properties one by one and paste onto another. Hence, this option is very useful.

Note: If 2 or more shapes are selected together and we use Paste Size, then the size of all shapes will combine together to match the size of the copied shape.

Paste Width

- It will paste only the width of the copied shape.

Paste Height

- It will paste only the height of the copied shape.

Paste Size separately

- Create a rectangle
- Select the rectangle
- Edit - Copy
- Create 4 rectangles
- Select all the 4 rectangles
- Edit – Paste Size – Paste Size Separately
- In this case, the width and height will be individually pasted onto the rectangles.

Paste Width separately


- Create a rectangle
- Select the rectangle
- Edit - Copy

- Create 4 rectangles
- Select all the 4 rectangles
- Edit – Paste Size – Paste Size Separately
- In this case, the width will be individually pasted onto the rectangles.

Paste Height separately

- Create a rectangle
- Select the rectangle
- Edit - Copy
- Create 4 rectangles
- Select all the 4 rectangles
- Edit – Paste Size – Paste Size Separately
- In this case, the height will be individually pasted onto the rectangles.

Find/Replace

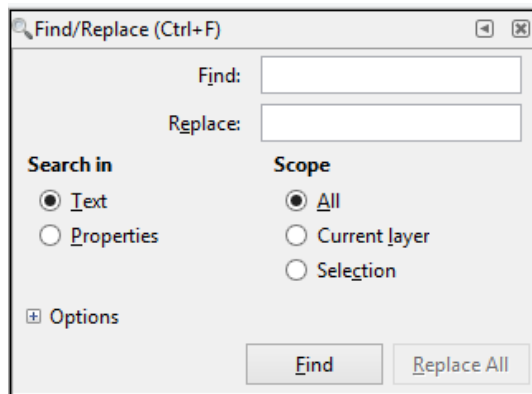
- Choose the  Tool
- Type “College”
- Choose the Select Tool
- Edit – Duplicate. Shortcut is Ctrl+D [Step A]
- Move the Text here and there [Step B]
- Repeat the Step A and Step B around 9 times

College College
 College College College
 College College College
 College
 College

- Now repeat the same process for the text “School”

School School School
 School School
 School School School
 School School

- Go to Edit – Find/Replace



[Screenshot]

- Type – College in the Find Section and click on Find
- It will display the College text one by one
- Now Type – University in the Replace Section
- Now click – Replace All
- You will see that all the text containing College will be replaced by University.
- In the Same process we can replace all the School text by Institute

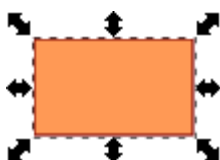
Duplicate

- Create a Rectangle
- Select the Rectangle
- Edit – Duplicate
- Selection Tool
- Move
- You will find a duplicate copy.
- The shortcut of Duplicate is Ctrl + D

Clone

Create Clone

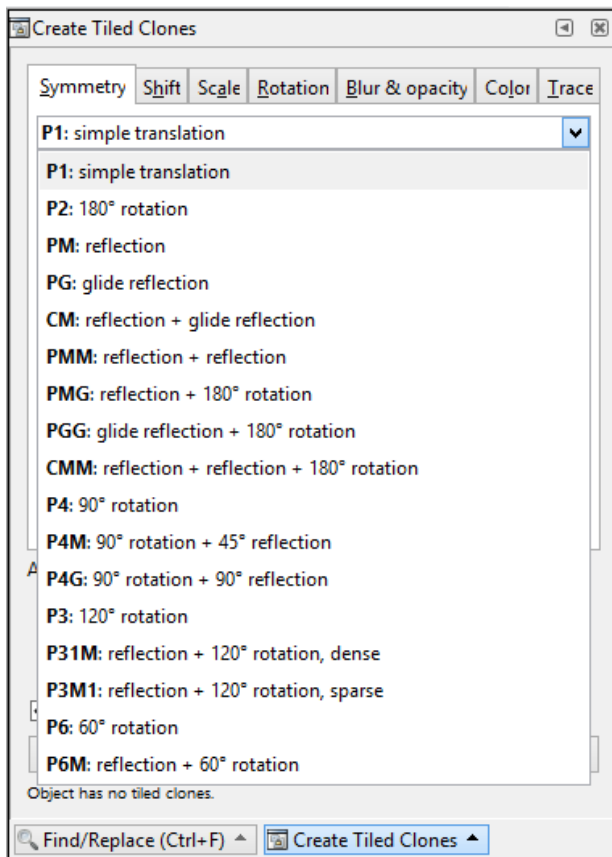
- Create a Rectangle



- Select the Rectangle
- Edit – Clone – Create Clone
- Move the Rectangle
- Select the original Rectangle
- Change the Width, Height, Colour etc.
- You will see that the changes are getting effected in the Cloned copies also.

Create tiled clone

- Create a Circle
- Select the Circle
- Edit – Clone – Create tiled clone



[Screenshot]

- Choose from the option and click on Create Tiled Clones
- There are lots of options associated with it. It has to be practiced one by one.

Unlink clone

- The clones will be unlinked and will become individual or standalone identities.

Relink to copied

- The clones will be relinked to the object which was copied in the clipboard.

Select original

- The original object from which the clone is created is selected automatically.

Clone original path

- The original shape of the object is cloned as original path.

Delete

- Create some shapes on the screen
- Selection tool
- Select all the shape
- Edit – Delete [Shortcut is Delete button on the keyboard]

Select All

- Create some shapes on the screen
- Edit – Select All
- It will select all shapes on the screen automatically without taking the mouse over it.

Select All in All layers

- It will select all the shapes in all the layers

Select same

Fill & Stroke

- Create a Rectangle
- Give a fill colour and a stroke colour
- Edit – Duplicate 6 nos.
- Move here and there
- Click outside
- Create a circle or any shapes
- Give the same fill colour and stroke colour as given to the Rectangle.

- Select any one rectangle
- Edit – Select same – Fill and stroke
- It will automatically select all the objects with the same fill and stroke properties.

Fill colour

- Create a Rectangle
- Give a fill colour.
- Edit – Duplicate 6 nos.
- Move here and there
- Click outside
- Create a circle or any shapes
- Give the same fill colour as given to the Rectangle.
- Select any one rectangle
- Edit – Select same – Fill
- It will automatically select all the objects with the same fill colour

Stroke colour Stroke Style Object type

- The same process is applied to Stroke colour, Stroke Style and Object type also. This option will select similar properties. It helps in reducing the time and effort for manually choosing a type of object.

Invert selection

- Create 4 to 5 shapes on the screen
- Select any one shape
- Edit – Invert Selection
- It will automatically select all the shapes which were not selected.

Deselect

- Create 4 to 5 shapes on the screen
- Select any shape
- Edit – Deselect

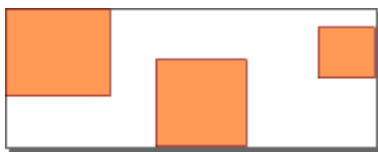
- It will Deselect the shape.
- This can be done by clicking outside also.
- But in some cases there are background filled objects which makes difficult to click outside in the vacant space. In that case, we can use Deselect.

Resize Page to Selection

- File – New
- Create 4 to 5 shapes
- Select all the shapes



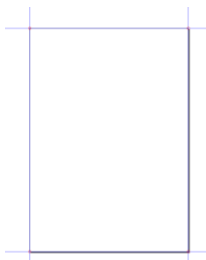
- Edit – Resize Page to selection.
- The width and height of the page will change to the border extent of the selection.



[Screenshot]

Create Guides around the page

- File – New
- Edit – Create Guides around the page



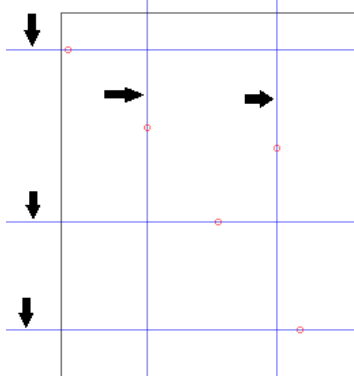
[Screenshot]

- It will create guides around the page for reference purpose. The guides will not come in

the printout.

Lock All Guides

- File – New
- Create Guides from dragging them from the Ruler.



[Screenshot]

- Edit – Lock all Guides
- It will lock all guides and they will not move even if it is clicked.

Delete All Guides

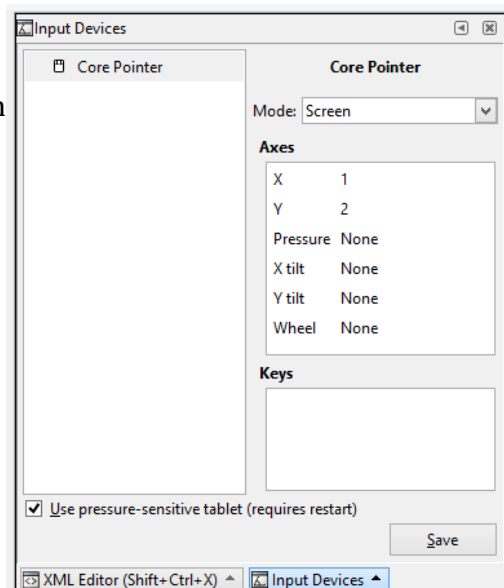
- If you want to delete all the guides together, go to Edit Menu – Delete all Guides.

XML Editor

- It will show the XML editor or the programming tree of the file. It is theoretical information.

Input Devices

- Professional Artists use Wacom tables and Pens which are pressure sensitive and draws just like a normal brush.
- Edit – Input Devices is used to configure such instruments if being used.



[Screenshot]

Preferences

- These are the by default software settings. It is recommended not to alter any options in it. It may result in software corruption.

View Menu

Zoom

Zoom In -It will help in Zoom into the details of the work area. Zoom

Out-It will help in Zooming out.

Zoom 1:1

Zoom 1:2

Zoom 2:1

Selection-

It will zoom the selection objects to the screen.

Drawing-

It will zoom in such a way that all the drawings will be fitted in one space.

Page-

It will zoom till the page fits the screen.

Page Width-

It will zoom till the page width fits the width of the screen area.

Previous Zoom-

It will display the previous zoom area. It is like undo button for Zoom.

Next Zoom-

It will display the next zoom area. It is like the redo button for Zoom.

Display Mode Toggle-

It will switch the display between Normal and Outline.

Normal-

It will display in Normal quality.

No filters-

It will display without Filters although the Filters are applied. It is used to save memory

while working.

Outline-

It will display the objects in outline only. It will now show the fill or gradient. It is used to save memory while working.

Colour display Mode Toggle-

It will switch the display between Normal (colour) and Greyscale.

Normal-

It will show the display in full colour.

Greyscale-

It will show the display in Black and White & Grey Shades.

Page Grid-

It will display the Page Grid.



[Screenshot]

Guides-

It will display the Guides if they are created by clicking and dragging from the rulers.

Colour Managed View-

It will switch between the original colour and the colour managed view.

Show/Hide-

The following can be shown or hidden by this option as per the convenience of the user.

Commands Bar Snap Control Bar

Tool Control Bar Toolbox

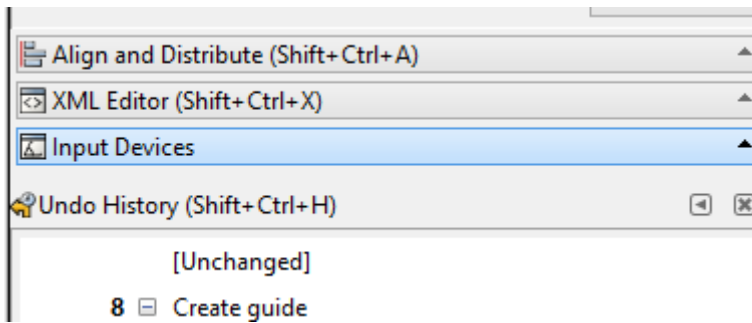
Rulers Scrollbars Palette Status

Bar

Show/Hide Dialogs

Dialog Box is the box with settings of tool and options shown in the right hand side of the

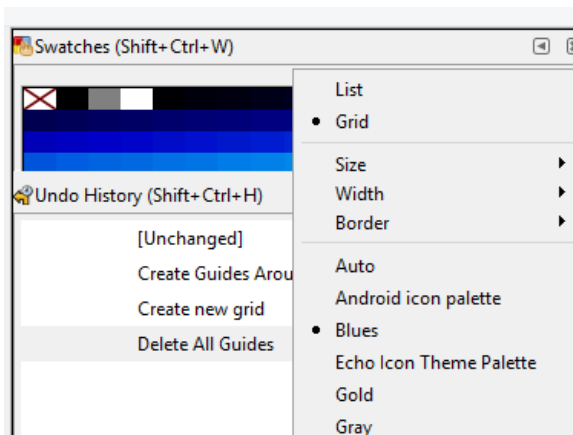
software. We can Show or Hide it as per our requirement.



[Screenshot]

Swatches-

Swatches are pre-defined colour setting which are packed in a dialog box. We can choose our colour shades as required.



[Screenshot]

Messages-

We can view or hide the messages in a dialog box.

Previous Window-

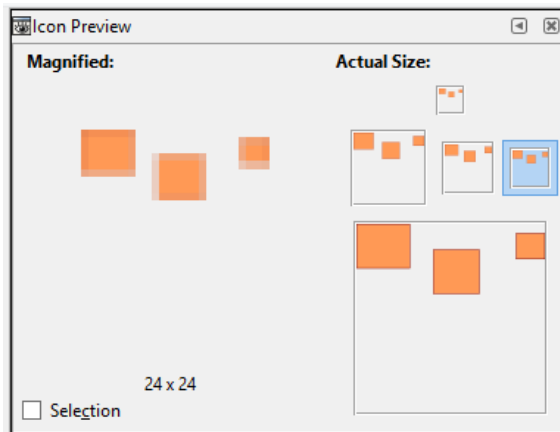
If there are 4 or 5 files opened at a time. Then we can switch between the files.

Next Window-

If there are more than one files opened at a time. We can switch between files.

Icon Preview-

The file created can be viewed as icon in small and big size.



[Screenshot]

Duplicate Window-

A duplicate window of the selected file will open. We can do changes and compare it with the original one.

Fullscreen-

The work area turns into Fullscreen covering the total area of the PC or laptop.

Default-

Settings of the area to work in default.

Custom-

Settings of the area to work as per our custom settings.

Wide-

Settings of the area to work in wide screen.

Unit Summary

In this Unit we have described the uses of each and every tool of Inkscape. The description of the tool is supported by the step by step instructions for practical use of the tool and creating the output out of the tool. After learning this unit, you can do designs, save them; export them in any format as required.

Assessment

- Describe the adjustment point of a line drawn using Pen tool called in Inkscape?
- Which format should be used for export so that the background transparency is maintained?
- Write the two commands which should be used for copying an object and pasting in the

same place?

Assignment

- Practice all the tools and save them in Inkscape file format and export them in JPG format.
- Write all the files of your practice in DVD using Nero with the video output, raw source files of the software used and submit it to the University.

Resources

Here are some referral links to video tutorials which will give you some information about Inkscape.

Inkscape tutorials: <https://inkscape.org/en/learn/tutorials/>
<https://www.unixmen.com/31-best-tutorials-of-inkscape/> <http://goinkscape.com/>

Unit 3 Illustration and Vector Design using Inkscape

Introduction

Digital Illustration tools and techniques in vector based software are very important foundation for creating a Project work. Illustrations are done using various combinations of tools and techniques in software. A single type of work can be done in various ways. It is the user who has to choose the best and convenient process of doing the work. Most of the illustrations are done using Vector based software's. Hence we have chosen Inkscape as a medium to demonstrate the vector capabilities of creating an output. Software's have come a long way in designing which has made the manual artist to get converted into Digital Artist in a much easier way.

Inkscape has menu bars which have lots of advanced options with the help of which you can create lots of readymade designs.

Outcomes

Upon completion of this unit you will be able to:

- *Use* the entire menu bar options of Inkscape.
- *Create* a project work using menu bar options.
- *Compose* a vector based output using Inkscape.

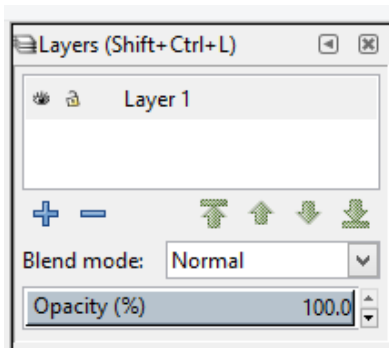
Terminology

- **Inkscape:** It is an open source vector based designing software.
- **Nodes:** Nodes are the Vertex point which is used to create a polygon or a shape.
- **Project:** The purpose of learning software is to create a Project out of it. The Project is the output purpose of learning which can be an Advertisement, Banner, Poster, Visiting Card etc.

Menu Bars of Inkscape

Layer Menu

- Go to Layer Menu – Layers [last option]
- It will display the docker in the right hand side of the software.

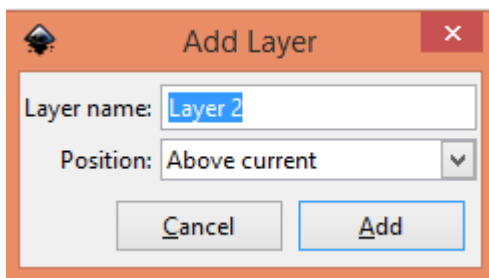


[Screenshot]

- File - New

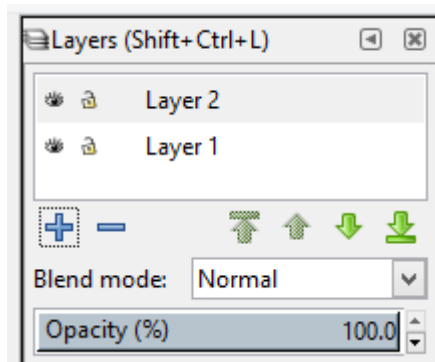
Add layer

- Click on the  symbol on the Docker OR Layer Menu – Add Layer



[Screenshot]

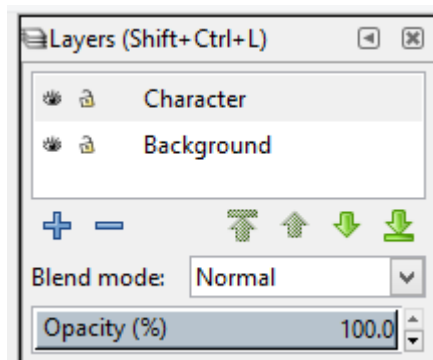
- It will add a new layer on the file.
- “Layer 2” is added above “Layer 1”



[Screenshot]

Rename layer



- Suppose we want to rename the “Layer 1” as “Background” and “Layer 2” as “Character”
- Select the “Layer 1” by clicking on it.
- Layer Menu – Rename OR Double click on “Layer 1” in the Docker
- Change the name.





[Screenshot]

Show/hide current layer

- We can hide the layer and then unhide whenever required by pressing the Eye Symbol in the Docker of the Layer OR from Layer Menu – Show/Hide current layer. It is like an ON and OFF button. One click will hide and another click on the same will unhide.
- Select the “Background” Layer
- Draw a Rectangle
- Select the “Character” Layer

- Draw an Ellipse
- Select the Layer “Background”
- Click on the  Icon
- It will hide the contents in this particular layer
- Click on the  Icon again
- It will unhide the contents in this particular layer

Lock/Unlock current layer

- We can lock the layer and then unlock whenever required by pressing the Lock Symbol in the Docker of the Layer OR from Layer Menu – Lock/Unlock current layer. It is like an ON and OFF button. One click will Lock and another click on the same will Unlock.
- If we Lock a Layer then we can see the contents of the layer but we cannot do any changes or modification to the subjects of that particular Layer.
- Select the “Background” Layer
- Click on the  Icon
- It will Lock the contents in this particular layer
- Click on the  Icon again
- It will unlock the contents in this particular layer

Switch to layer above

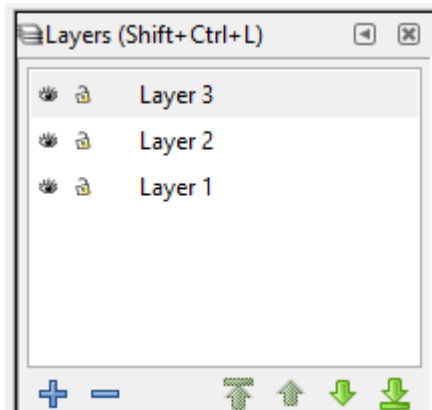
- It is used to select the layer above the current layer.
- Select the “Background” Layer in the docker.
- Layer Menu – Switch to layer above.
- It will automatically select the “Character layer” in the docker.

Switch to layer below

- It is used to select the layer below the current layer.
- Select the “Character” Layer in the docker.
- Layer Menu – Switch to layer below.
- It will automatically select the “Background layer” in the docker.

Move selection to layer above

- Create a New File
- Draw a Rectangle
- Layer Menu – Add Layer
- Draw an Ellipse
- Layer Menu – Add Layer
- Draw a Polygon
- Rectangle is in Layer 1
- Ellipse is in Layer 2
- Polygon is in Layer 3



[Screenshot]

- Select the Rectangle
- Layer Menu – Move selection to layer above.
- The Rectangle will be transferred to Layer 2
- Check by Hiding the Layer 2.
- Unhide Again.

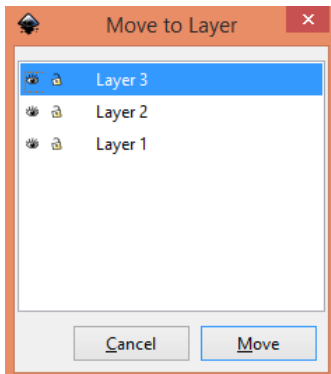
Move selection to layer below

- Continue this from the previous option “Move selection to layer above”
- Now select the Ellipse which is in Layer 2
- Layer Menu – Move selection to layer below
- The Ellipse will move to the layer below which is Layer 1

- Check by Hiding the Layer 1
- Unhide Again.

Move selection to layer

- Continue this from the previous option “Move selection to layer below”
- Select the Polygon which is in Layer 3
- Layer Menu – Move Selection to Layer –



- Choose the Layer in which you want to move the selection into.
- Click on Layer 1
- Hide the layer to check.
- Unhide the layer again.

Raise layer

- This option is used to move the position of the selected layer above by one position.

Lower layer

- This option is used to move the position of the selected layer below by one position.

Layer to top

- This option is used to move the selected layer to the top of all layers.

Layer to bottom

- This option is used to move the selected layer to the bottom of all layers.

Duplicate current layer

- This option will create a duplicate layer of the selected current layer.

Delete current layer

- This option will delete the current layer.

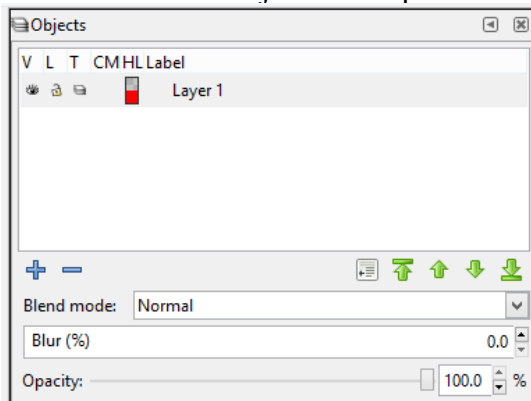
Layers

- This option will bring the Layer docker on the right hand side of the software.

Object Menu

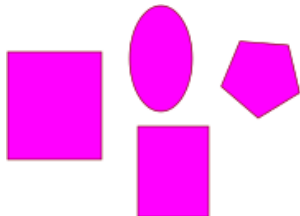
Objects

- New File
- Objects Menu – Objects
- A docker of the Objects will open in the right hand side of the software.



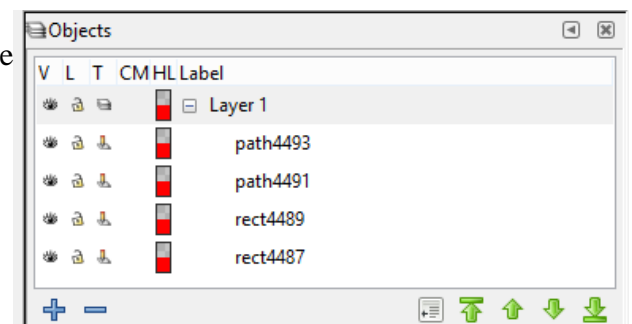
[Screenshot]

- Create 4 to 5 shapes










[Screenshot]

- The docker will look as following with the objects.



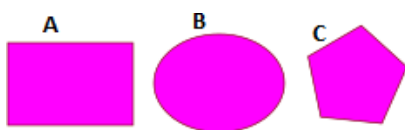
[Screenshot]

-  - We can add a Layer by clicking on this “+” button.

-  - We can delete the selected object by pressing this button.
-  - We can collapse i.e. expand the layer to display all the objects in it.
-  - Select an object. Click on this button to move it to the top of all objects.
-  - Select an object. Click on this button to move it above by one object.
-  - Select an object. Click on this button to move it below by one object.
-  - Select an object. Click on this button to move it to the bottom of all objects.
- Blend mode: - We can change the blend mode of the object using this options.
- Blur (%) -We can blur the selected object using this option.
- Opacity: % - We can increase or decrease the opacity i.e. transparency of the selected object using this option.

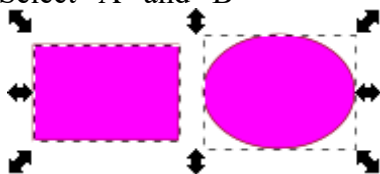
Selection sets – This will Act as an Open Group but not be a group. In this open group, one can add a single object to many groups or Selection sets.

- New File
- Create a Rectangle suppose “A”
- Create a Circle suppose “B”
- Create a Polygon suppose “C”



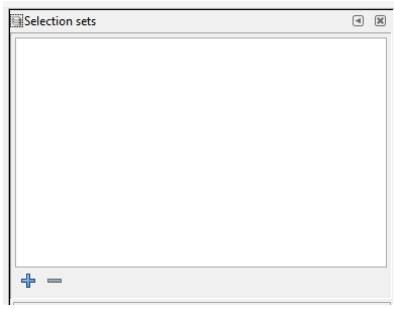
[Screenshot]

- Select “A” and “B”



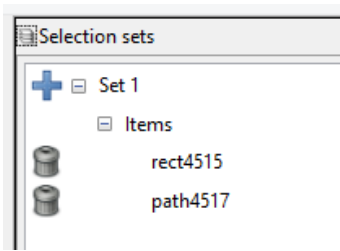
[Screenshot]

- Object Menu – Selection Sets
- A docker will open in the right hand side of the software.



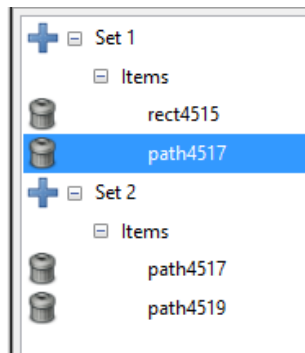
[Screenshot]

- Click on the “+” symbol [New Selection set]
- Expand the set



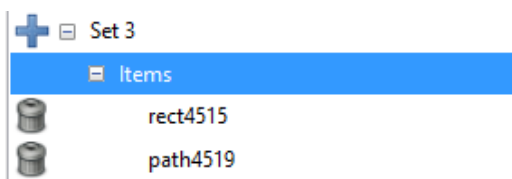
[Screenshot]

- Select “B”+ “C”
- Click on the “+” symbol



[Screenshot]

- Now we have two sets where “path4517” or “B” shape is common in both the sets.
- Select “A” + “C” [Select “A”, Hold Shift and Click on “C”]
- Click on the “+” symbol
- Now we have three sets.

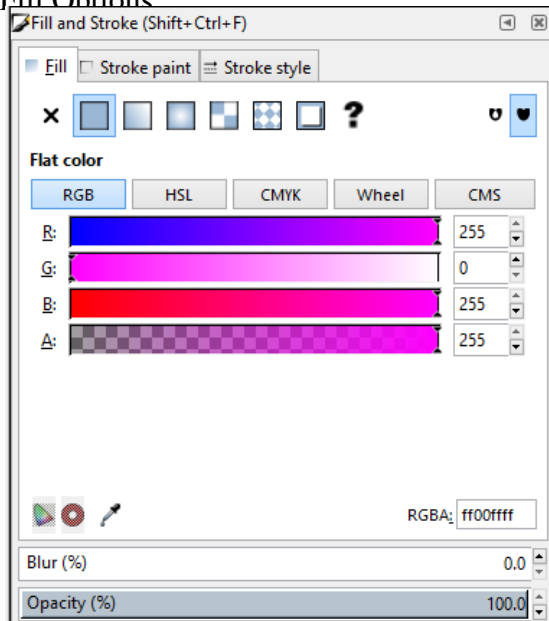


[Screenshot]








- Now Click on “Set 1” & Move
- Click on “Set 2” & Move
- Click on “Set 3” & Move

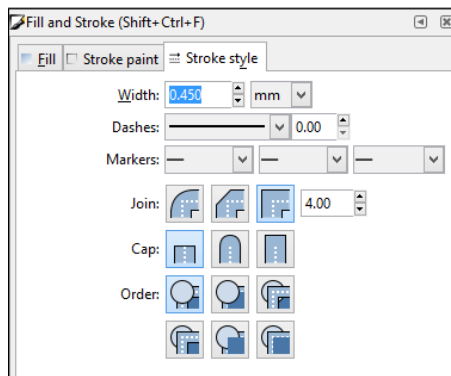
Fill & Stroke

- Create a Rectangle or any Shape
- Object Menu – Fill and Stroke
- Fill Options



[Screenshot]

-  - No Fill
-  - Flat Colour
-  - Linear Gradient
-  - Radial Gradient
-  - Mesh Gradient
-  - Pattern Gradient
-  - Swatch Colours
- Stroke Paint Options
- The stroke colours options are the same as fill colour options. The colour type selected is applied to the border of the shape.
- Stroke Style Options

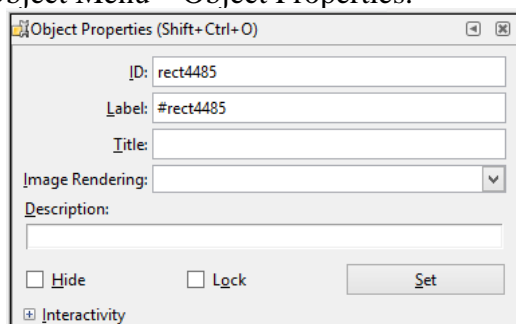


[Screenshot]

- Create a Rectangle
- Object Menu – Fill and Stroke
- Stroke Style
- Width – Assign the width of the stroke
- Dashes – The style of the stroke
- Markers – Assign as required
- Join – The corners of the shape can be round, straight or corner
- Cap – The segment corner can be straight, round or extendedly straight.
- Order – The position of the style.

Object Properties

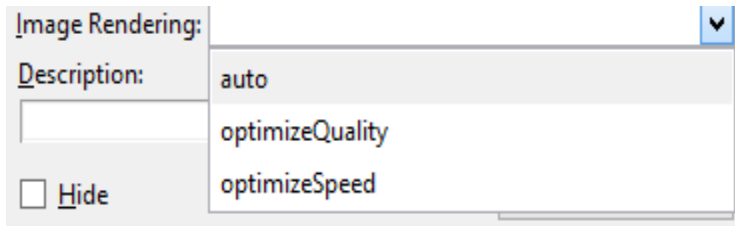
- Create a Rectangle or any shape.
- Object Menu – Object Properties.



[Screenshot]

- ID: The name of the shape as per the software.
- Label: The identity of the shape as per the software.
- Title: We can manually add the title to the shape as per our subject.

- Image Rendering: The type of quality of output.

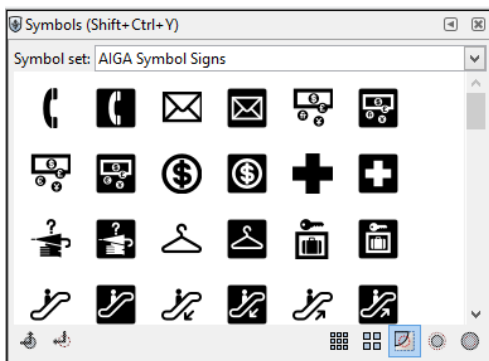


[Screenshot]

- Description: The details of the shape can be given if required.

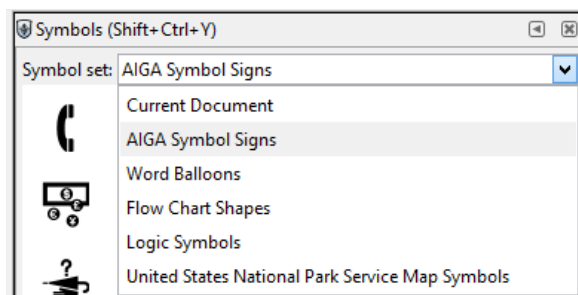
Symbols

- Object Menu – Symbols
- A Docker of Symbols will open in the right hand side of the software.
- It contains lots of in-built designs which can be used as per our requirement.



[Screenshot]

- Click on any design and drag it to the screen.
- There are different types of symbol categories also.



[Screenshot]

Group

- Create 4 to 5 shapes
- Select all the shapes together

- Object Menu – Group. [**Ctrl + G** is the shortcut]
- It will group the object as single object.
- Now Move the object, it will move in group.

Ungroup

- A group is created as above.
- If you do not want that group and break them into individual shapes again.
- Go to Object Menu - Ungroup

Put selected objects out of group

- Create 4 to 5 rectangles
- Select all the shapes together
- Object Menu – Group
- Double click on the Group
- Select any one shape
- Object Menu – Put selected objects out of group
- Now click outside
- Move the group
- You can see that the object which was put out of group is no more part of the group.

Clip

Set

- File – Import – (select an image)
- Create a rectangle or any shape over it



[Screenshot]

- Select the image and shape together
- Object – Clip – Set
- The image will get clipped inside the shape



[Screenshot]

Release

- After the Clip is Set, if you want to Release it Click on Object – Clip – Release
- It will separate both the image and shape as it was in the beginning.

Mask –

- The Process of Clipping and Masking is same. In the Clip, the image gets inside the shape with 100% transparency. In the Mask, the image gets inside the shape and the properties of transparency or gradient can be set manually by the user. Use Mask with Black, Gray and White colour separately, the difference can be seen.

Set

- File – Import – (select an image)
- Create a rectangle or any shape over it



[Screenshot]

- Select the image and shape together
- Object – Mask – Set
- The image will get clipped inside the shape



[Screenshot]

Release

- After the Mask is Set, if you want to Release it Click on Object – Mask – Release
- It will separate both the image and shape as it was in the beginning.

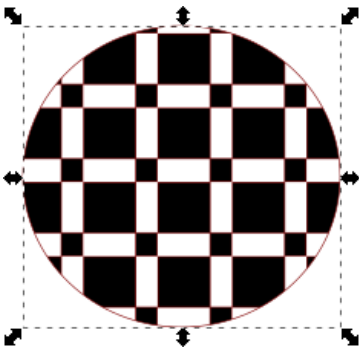
Pattern

Objects to Pattern

- Create a Pattern design using Shapes



- Select all the shapes used in the pattern design
- Object – Pattern – Object to Pattern
- Create a Big Circle
- Go to Object – Fill and Stroke
- Under the Fill – Choose Pattern fill

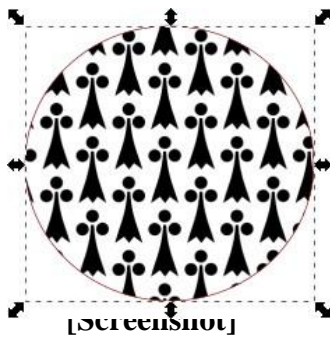


[Screenshot]

- The created pattern design is used as Pattern automatically. We can choose our own pattern from a group of patterns created.

Pattern to Objects

- Create a big Circle
- Go to Object – Fill and Stroke
- Under the Fill – Choose Pattern fill
- Choose a different pattern which you have not created.



- Object – Pattern – Pattern to Objects



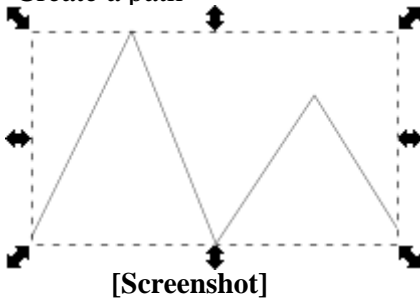
- It will derive the pattern design.
- We can do some changes and modify the design and again create a pattern out of it.

Objects to Marker

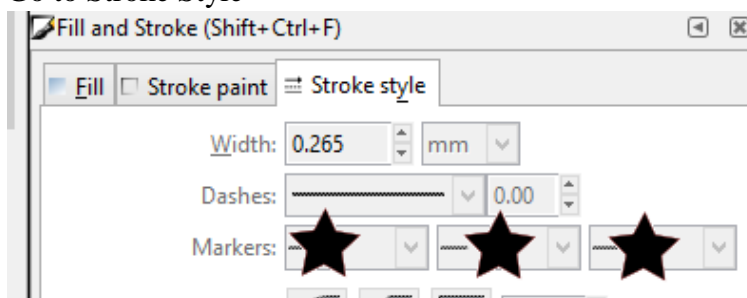
- Create a Marker design using shapes.



- Select the design
- Object – Objects to Marker
- Create a path



- Select the Path
- Object – Fill and Stroke
- Go to Stroke Style –

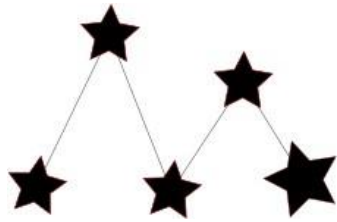


[Screenshot]

- Sometimes the Shapes of the marker will be displayed as a Box. Click on it. It will show

the created design.

- The output will be as follows:



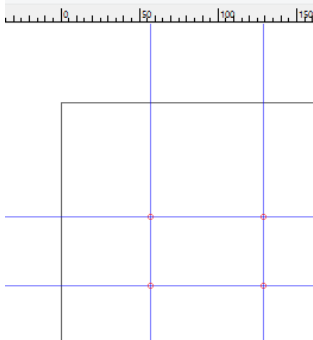
[Screenshot]

Objects to Guides

- Create a Rectangle
- Select the Rectangle



- Object – Objects to Guides



[Screenshot]

Raise

- Create 4 to 5 filled shapes one over the other with different colours.



[Screenshot]

- Select a shape in between.
- Click on Object – Raise
- It will raise the object to one object above.

Lower

- Create 4 to 5 filled shapes one over the other with different colours.

- Select a shape in between.
- Click on Object – Lower
- It will lower the object to one object below.

Raise to Top

- Create 4 to 5 filled shapes one over the other with different colours.
- Select a shape in between.
- Click on Object – Raise to Top
- It will raise the object above all objects.

Lower to Bottom

- Create 4 to 5 filled shapes one over the other with different colours.
- Select a shape in between.
- Click on Object – Lower to Bottom
- It will lower the object below all objects.

Rotate 90° CW

- Create a shape or a group of shapes



- Select -
- Object – Rotate 90° CW
- The selected objects will rotate 90 degree clock wise.



Rotate 90° CCW

- Create a shape or a group of shapes
- Select

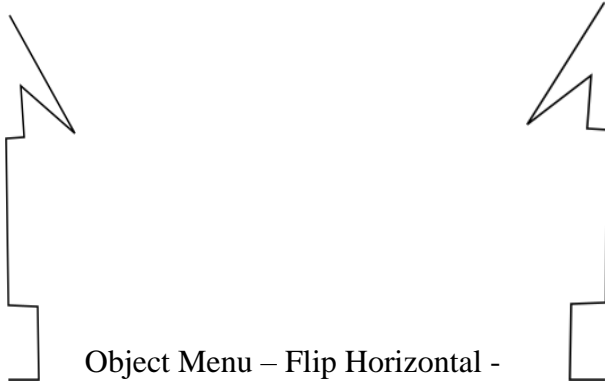


- Object – Rotate 900 CW
- The selected objects will rotate 90 degree counter clock wise.



Flip Horizontal

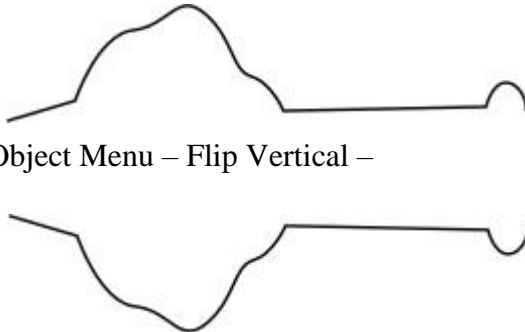
- Create a shape which needed to be flipped or mirrored horizontally



- Object Menu – Flip Horizontal -

Flip Vertical

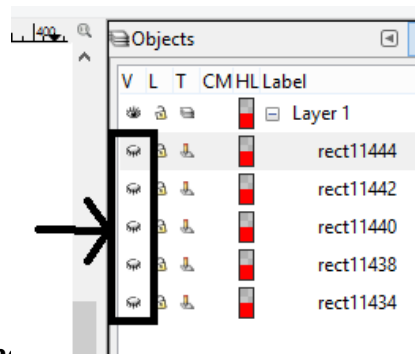
- Create a shape which needed to be flipped or mirrored vertically



- Object Menu – Flip Vertical –

Unhide All

- Create 4 to 5 shapes
- Object – Objects
- Hide all the shapes in the docker



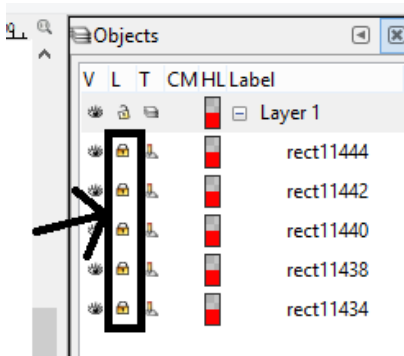
[Screenshot]

- Object – Unhide All

- It will unhide all the objects in one go. You need not unhide by clicking on shapes eye symbol on docker one by one.

Unlock All

- Create 4 to 5 shapes
- Object – Objects
- Lock all the shapes in the docker

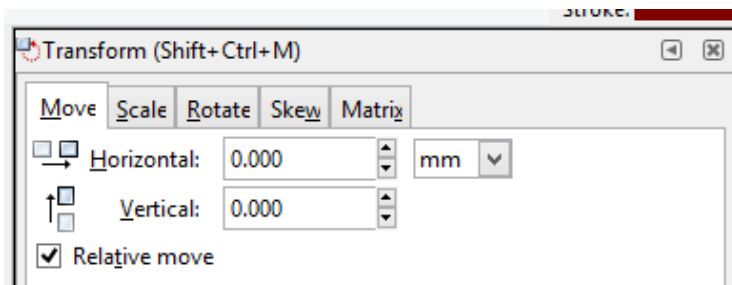


[Screenshot]

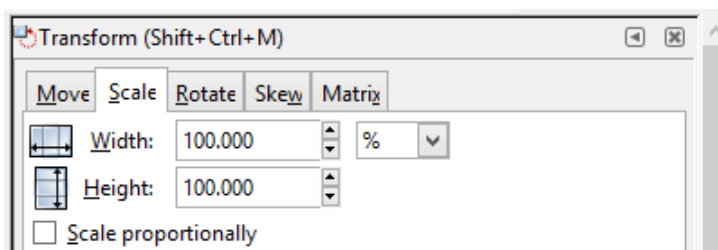
- Object – Unlock All
- It will unlock all the objects in one go. You need not unlock by clicking on lock symbol on docker one by one.

Transform

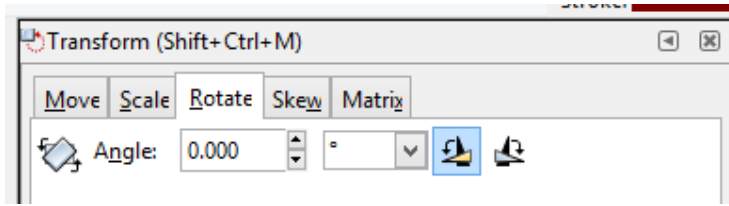
- This option is used to Move, Rotate, Scale and Skew the Objects as per numerical data which will allow perfect measurement output.
- Create a Rectangle or any Shape
- Object Menu – Transform
- Move -



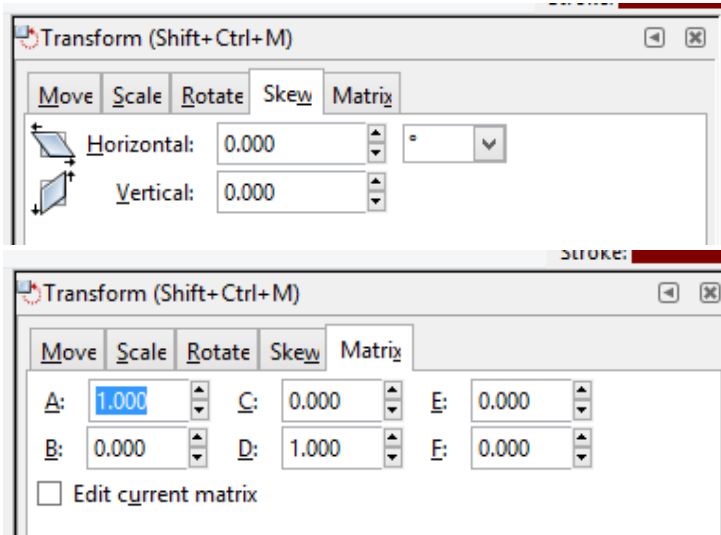
- Scale -



- Rotate -



- Skew -



[Screenshot]

Align and Distribute

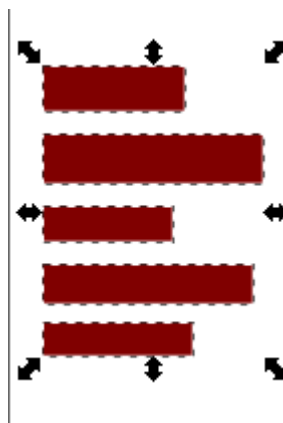
Align is used to keep the objects in a perfect lining. Distribute is used to maintain equal spacing between the shapes.

- Create Shapes as shown



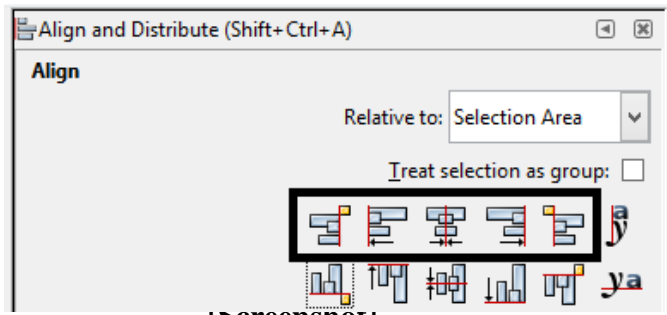
[Screenshot]

- Select the following shapes



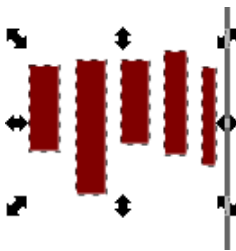
[Screenshot]

- Object Menu – Align and Distribute



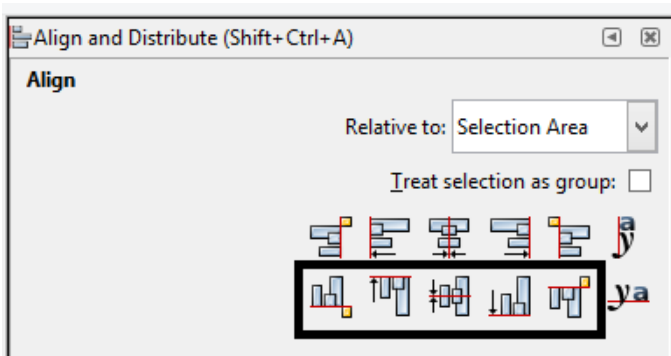
[Screenshot]

- Use the boxed options for this kind of selection.
- Alignment Left, Center and Right
- Select the following shapes



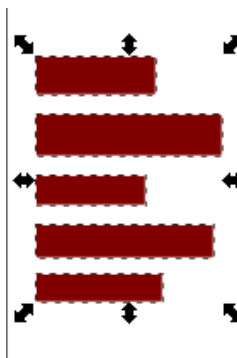
[Screenshot]

- Object – Align and Distribute



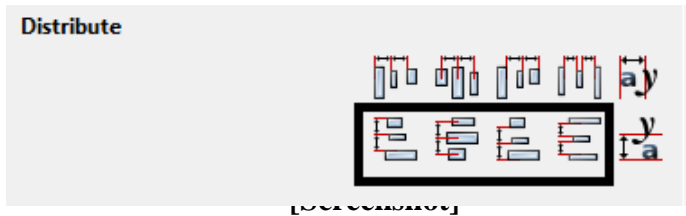
[Screenshot]

- Use the boxed option for this type of selection
- Alignment Top, Center and Bottom
- Select the following shapes

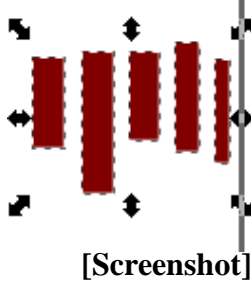


[Screenshot]

- Use the Distribute options which is boxed



- Select the following shapes



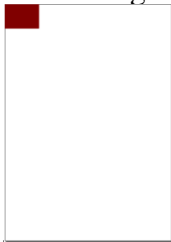
- Use the Distribute options which is boxed



[Screenshot]

Aligning a Shape in the Top Left corner of a Page

- Create a Rectangle
- Select the Rectangle
- Object Menu – Align and Distribute
- Choose – Relative to – Page
- Choose Alignment – Left
- Choose Alignment – Top

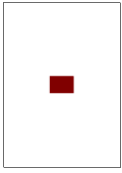


[Screenshot]

Aligning a Shape to the Center of the Page

- Create a Rectangle
- Select the Rectangle
- Object Menu – Align and Distribute

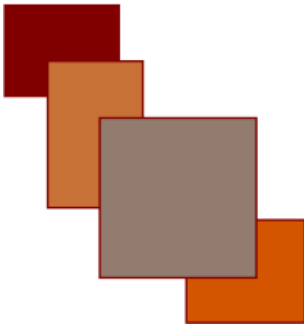
- Choose – Relative to – Page
- Choose Alignment –Horizontal Center
- Choose Alignment – Vertical Center



[Screenshot]

Rearrange

- Create 4 to 5 shapes one over the other with different colours.



[Screenshot]

- Select all the shapes together. Click on the Rearrange options one by one to view the results.



- - Nicely Arrange selected connector network.



- - Exchange position of selected objects – selection order



- -Exchange position of selected objects – stacking order



- -Exchange position of selected objects – counter clockwise

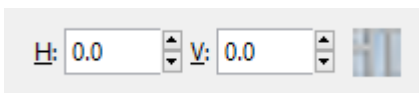


- -Randomize centers in both directions



- - Unclamp Objects – Try to equalize end to end distance

Remove Overlaps



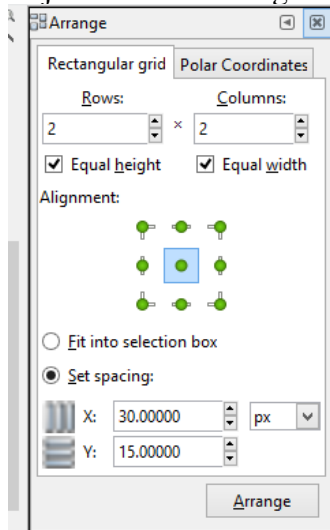
- It is used to remove overlaps of objects.

Arrange

- Create 3 or 4 Rectangles or any shapes
- Select the shapes together



- Object Menu – Arrange



- Choose the options and click arrange

Arranging shapes along a circle

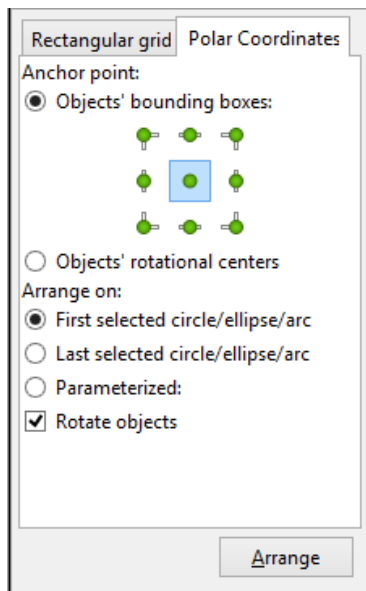
- Create few shapes and a big circle



[Screenshot]

- Select all the shapes together
- Object Menu – Arrange

- Polar Coordinates



[Screenshot]

- Choose the options one by one click to Arrange to experiment the outputs.

Path Menu


Object to Path

- Create a Rectangle

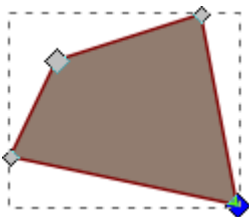


- Tool

- Try to move the corner nodes
- It will not move the nodes individually, it will scale the object.
- Select the Rectangle
- Path Menu – Object to Path

- Now choose the  Tool


- Move the nodes, it will move individually.



- This option is applicable to readymade shapes available in the software like Rectangle, Ellipse, and Polygon etc.

Stroke to Path

- Create a Rectangle
- Object Menu – Fill and Stroke
- Fill – None
- Stroke Style
- Width – 6 mm [Thick edges]
- Path Menu – Stroke to Path
- Now the outline stroke will get converted into a Fill Shape.

- Choose the  Tool
- Move the edge points to check



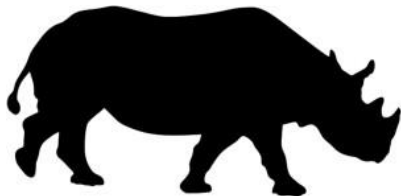
[Screenshot]

Trace Bitmap

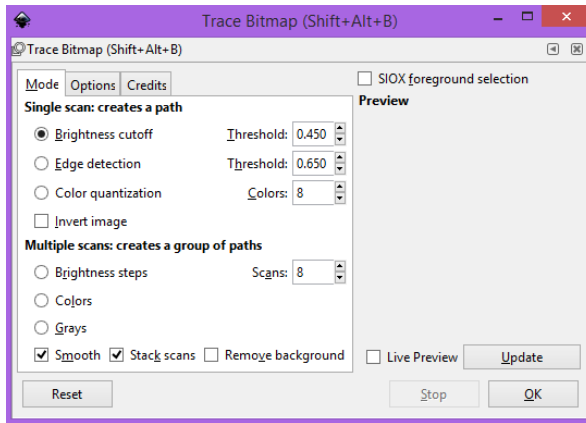
- Go to Internet search engine like goggle and search for Vector Art, Black colour silhouette art etc.




- File – Import – [choose an image downloaded]

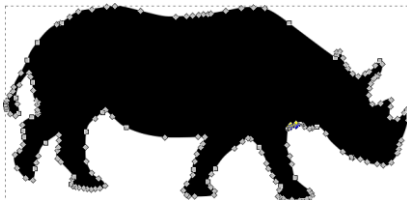


- This is a Raster image of a Vector Art
- Path Menu – Trace Bitmap



[Screenshot]

- Choose the Settings.
- Live Preview and Update
- After choosing from the preview – OK
- Move the Shape which is created.
- You can see two shapes, one is the vector shape which is created and other is the old shape.
- Delete the old shape.
- Choose the  Tool
- You can move the node points to edit.



Trace Pixel Art

- It is basically used in small Pixel files in case of Icons, Video games etc. The files are of mostly in PNG format.
- File – Import – Choose an Icon file



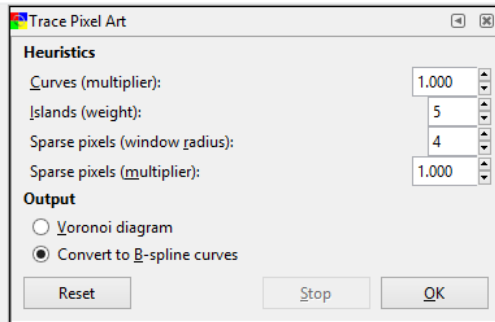
Title- Pixel art

Attribution-

Source- inkscape.org

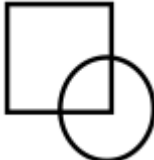

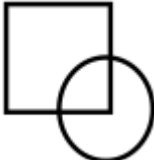

Link- <https://inkscape.org/en/doc/tutorials/tracing-pixelart/tutorial-tracing-pixelart.en.html>

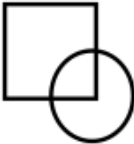
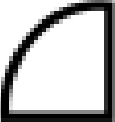


- Path Menu – Trace Pixel Art




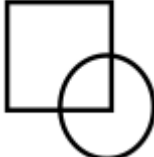




- Experiment with the settings above and Click OK.



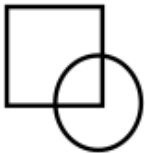
Union	Difference
<ul style="list-style-type: none">• Create two or more intersecting shapes.• • Select both the shapes• Path Menu – Union• 	<ul style="list-style-type: none">• Create two or more intersecting shapes.• • Select both the shapes• Path Menu – Difference• 

<p>Intersection</p> <ul style="list-style-type: none"> • Create two or more intersecting shapes.  <ul style="list-style-type: none"> • Select both the shapes • Path Menu – Intersection 	<p>Exclusion</p> <ul style="list-style-type: none"> • Create two or more intersecting shapes.  <ul style="list-style-type: none"> • Select both the shapes • Path Menu – Exclusion 
---	---

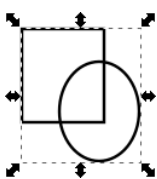
<p>Division</p> <ul style="list-style-type: none"> • Create two or more intersecting shapes.  <ul style="list-style-type: none"> • Select both the shapes • Path Menu – Division  <ul style="list-style-type: none"> • Select the 2nd shape and move 	<p>Cut Path</p> <ul style="list-style-type: none"> • Create two or more intersecting shapes.  <ul style="list-style-type: none"> • Select both the shapes • Path Menu – Cut Path  <ul style="list-style-type: none"> • Move the 2nd shape 
---	---

Combine

- Create two or more intersecting shapes.



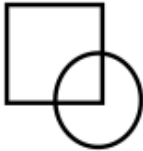
- Select both the shapes
- Path Menu – Combine



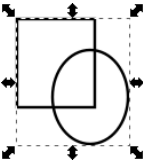
- Both the shape will be combined and form a single object.

Break Apart

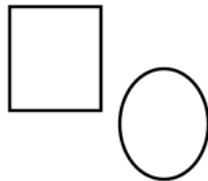
- Create two or more intersecting shapes.



- Select both the shapes
- Path Menu – Combine



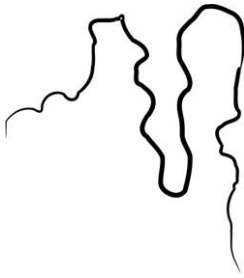
- If you want to break the two shapes apart then click on Path Menu – Break Apart.
- The shapes will become individual again. Move to Check.



<p>Inset</p> <ul style="list-style-type: none"> • Create a Rectangle or any shape • Path Menu – Inset • It will decrease the size of the total shape. • Try this option typing text, then select the text, Path Menu – Object to Path, Then Use Path Menu – Inset 	<p>Outset</p> <ul style="list-style-type: none"> • Create a Rectangle or any shape • Path Menu –Outset • It will increase the size of the total shape. • Try this option typing text, then select the text, Path Menu – Object to Path, Then Use Path Menu - Outset
<p>Dynamic Offset</p> <ul style="list-style-type: none"> • Create a Rectangle or (type a text, then select the text, Path Menu –Object to Path) • Select the Rectangle or Text • Path Menu – Dynamic Offset • Click on the border area and drag to define the offset space. 	<p>Linked Offset</p> <ul style="list-style-type: none"> • Create a Rectangle or (type a text, then select the text, Path Menu – Object to Path) • Select the Rectangle or Text • Path Menu – Linked Offset • Click on the border area and drag to define the offset space.

Simplify

- Choose the  Tool
- Click and drag on the screen to draw design.



- Select the design
- Path Menu – Simplify



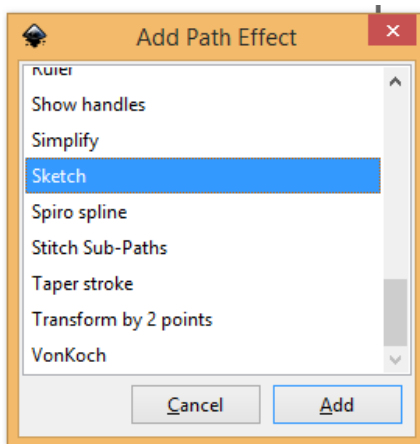
- It will reduce the nodes and make the shape smoother.

Reverse

- It will reverse the starting point and ending point of the shape. The output will not be visible. This option is used while writing a Text on a path.

Path Effects

- Create any shape
- Path Menu – Path Effects –
- Click on the “+” symbol and choose the Path Effect



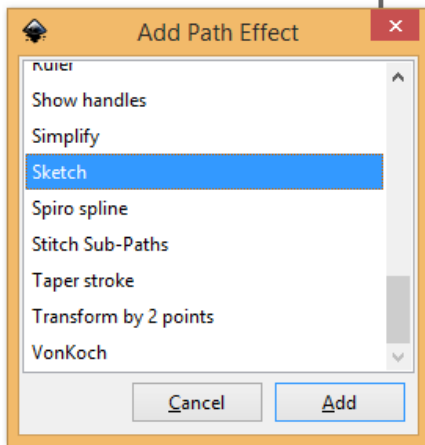
[Screenshot]

- We can add more than one path effect also.

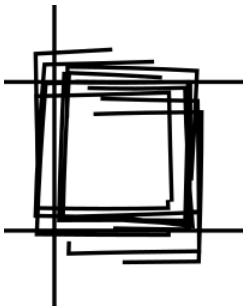
Paste Path Effect

- Create any shape

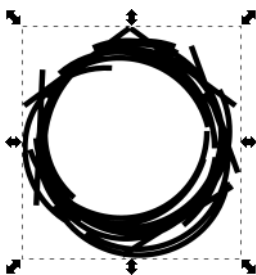
- Path Menu – Path Effects –
- Click on the “+” symbol and choose the Path Effect



[Screenshot]

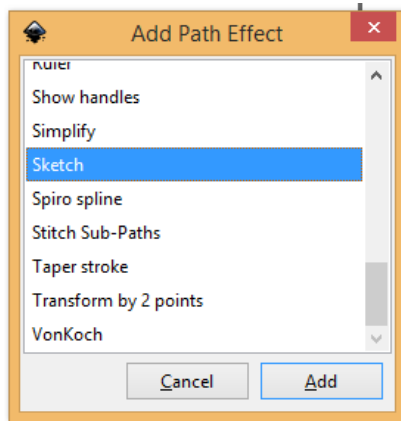


- We can add more than one path effect also.
- Select the Shape
- Edit – Copy
- Create another shape
- Path Menu – Paste Path Effects
- It will paste the path effect of the copied shape.



Remove Path Effect

- Create any shape
- Path Menu – Path Effects –
- Click on the “+” symbol and choose the Path Effect



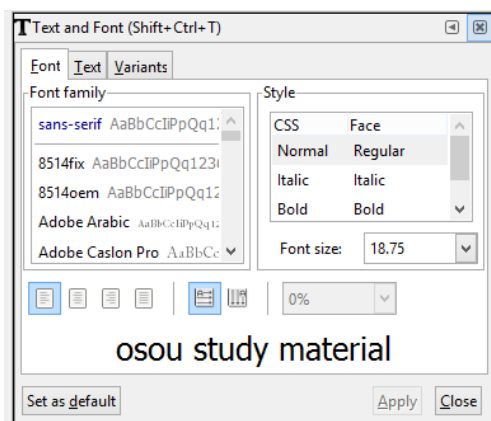
[Screenshot]

- We can add more than one path effect also.
- If we do not want any Path Effect, click on Path Menu – Remove Path Effect.

Text Menu

Text and Font

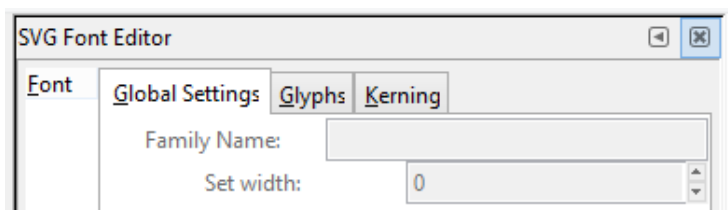
- Type a Text
- Text Menu – Text and Font
- Choose the font, size etc. as required



[Screenshot]

SVG Font Editor

- This is used to create Own Fonts



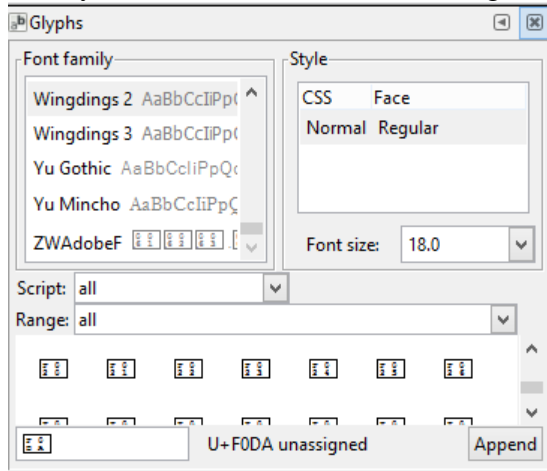
[Screenshot]

- This is a section for development purpose and not for learning design.

Glyphs

- These are the readymade symbols as compared to a Character Map of Default Windows.

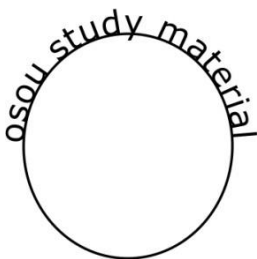
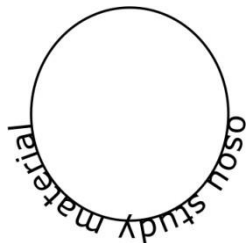
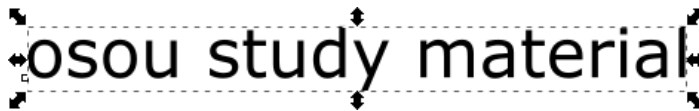
The symbols are not visible in the original form in some computers.



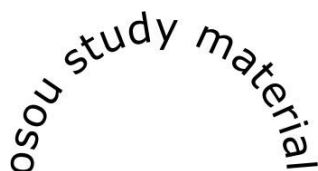
[Screenshot]

Put on Path

- Create a Text
- Create a Circle
- Select the Circle
- Path – Object to Path
- Select both the text and circle
- Text Menu – Put on Path



- Select the circle and rotate
- Select the Circle
- Remove the stroke

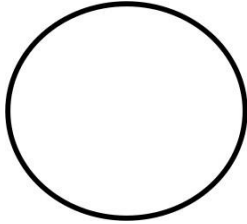


Remove from Path

- Select the Text which has put on the path.
- Text Menu – Remove from path.
- It will be back into the original form.

Flow into Frame

- Create a Circle
- Select the Circle
- Path – Object to Path



- Create a Paragraph Text
Sun is high in the
sky. Moon is high
in the sky. Stars
- Select both the circle and the text
- Text Menu – Flow into frame

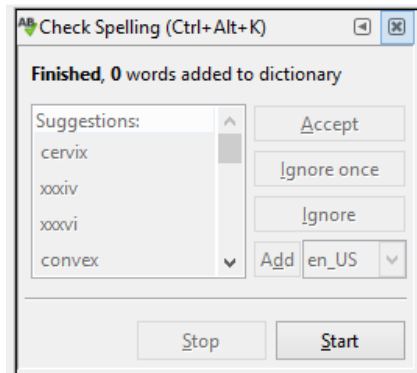


Unflow

- Click on Unflow if you want to delink the text from the shape.

Check Spelling

- Type some text with wrong spellings.
- Check the spellings of the wrong words and correct them.



Filters Menu

- Filters are experimental effects.
- Create a Rectangle or any shape
- Select the shape
- Filter Menu – Apply all the filters one by one and practice.

Extension Menu

- Create a Rectangle or any shape
- Select the shape
- Extension – Apply all the extension one by one and practice.

Unit Summary

In this Unit you have learnt about the Inkscape options and certain examples of creating practical work using Inkscape. The Knowledge of all the option of the software will help in accomplishing any project successfully with ease. An example of the projects done in this unit will help you explore the technical aspects of a project which will be needed at the time of publishing or printing the work.

Assignment

- Practice the examples of each and every option shown in this unit.
- Create a list of shortcuts of the tools and options which you feel important and frequently used.
- Save the files which have been practiced and submit it in a DVD to the University.

Assessment

- Which option should be used for repeating a same design or tiling a design?
- Which option should be used to keep the object in perfect line either to the left, right or center?
- Which option is used to maintain equal spacing between shapes?

- Which option is used to convert Raster image into Vector image?

Resources

Web Reading Reference

Inkscape tutorials:

<https://inkscape.org/en/learn/tutorials/> <https://www.unixmen.com/31-best-tutorials-of-inkscape/> <http://goinkscape.com/>

Flower Design using Inkscape step by step

<https://design.tutsplus.com/tutorials/quick-tip-fun-tricks-with-inksapes-polygon-tool--vector-14959>

Working with Inkscape Nodes

<https://design.tutsplus.com/tutorials/tips-and-tricks-for-working-with-inksapes-nodes--vector-19804>

50 Tutorials using Inkscape

<https://creativenerds.co.uk/tutorials/inkscape-tutorials/>

Unit 4 Professional Projects

Introduction

is intended for people who want to get their hands on The process of learning and the process of implementation of the knowledge learned are two different things. While learning the tools and techniques of software, you get acquainted with the use of the tools. When you are working on a project, you have to judge the combination of tools and options required to get a specified result. Sometimes, people learn perfectly, but when it comes to a Project work; we are not able to accomplish them perfectly. The reason is due to lack of practice of a work. While learning a tool, you learn it once. But, when you have to do a Project you have to apply the tools multiple number of times which requires persistence and hard work; only knowledge will not work. In case of project work, all the tools and techniques of software are not applied everywhere. There are projects which are done using only a few options of the software. It is about specialization of a particular type of work you practice which will make you a professional. When we come to software's, there are many software's available to create a single type of output. It is about your judgment based on your practice which will complete your project work perfectly and on time. In this unit you will learn about how professional projects are designed.

Outcomes

Upon completion of this unit you will be able to:

- *Design* professional Project works.
- *Describe* the process of doing a project work in particular software.
- *Examine* the format of Graphic design output.
- Employ the combination of software's used to complete a certain work.

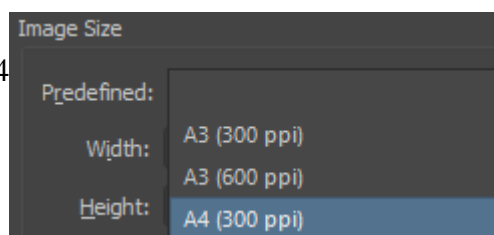
Terminology

Professional : Creating a work or a project which has a value in a systematic way and in stipulated time.


Output Format: Output format is format used to create an output in a Digital File. Every software has its own format for saving a file.

Creating a 3D ball using Krita


- File – New – Image Size - Predefined – A4 (300 PPI)

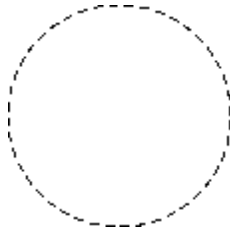



[Screenshot]

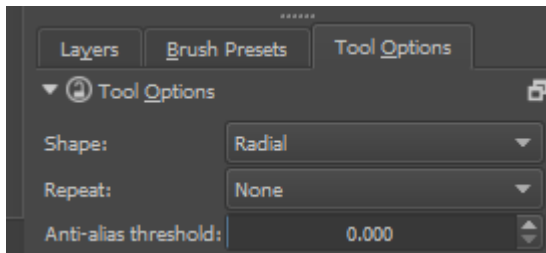
- Click on Create
-  Choose Elliptical Selection Tool
- Click and Drag on screen holding Shift

Note it!

-  Choose Elliptical Selection Tool
- First Click and drag on the screen, then Hold the Shift.
- DONOT HOLD THE SHIFT FIRST.

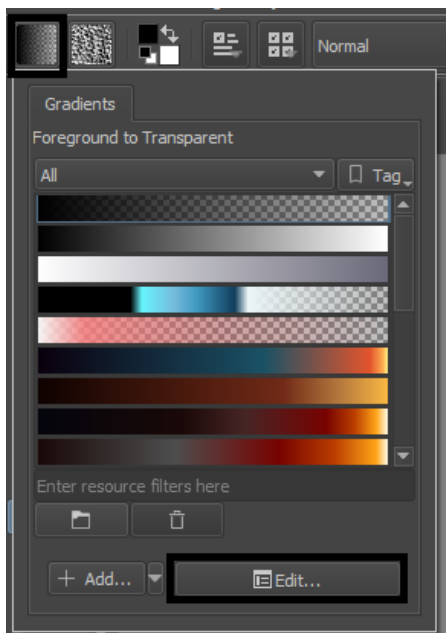


-  Gradient Tool
- Tool Options –
- Shape – Radial



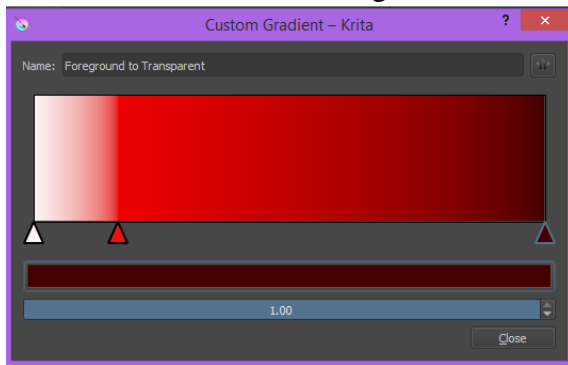
[Screenshot]

- Click on the Gradients – Click on Edit



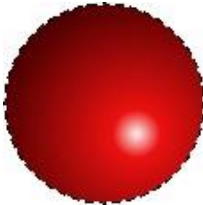
[Screenshot]

- Click on the First Colour – Change it to White colour.
- Create a Second colour maker – Change it to Red colour
- Click on the end Marker – Change the colour to the dark shade of second colour.



[Screenshot]

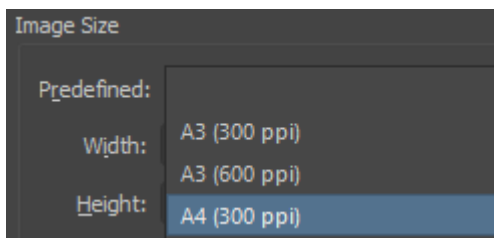
- Now click and drag on the selection from a corner where you need the highlighter.
- Output




- Create a 3D Ball out of the following colours using the same process as shown above.
 - Green Colour
 - Blue Colour

Create a 3D button using Krita

- File – New – Image Size - Predefined – A4 (300 PPI)



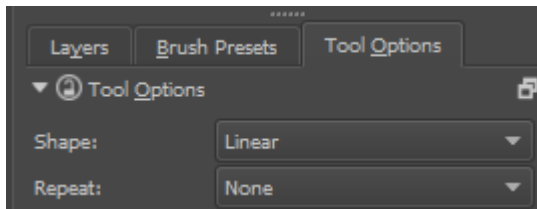
[Screenshot]

- Click on Create
-  Choose Elliptical Selection Tool
- Click and Drag on screen holding Shift



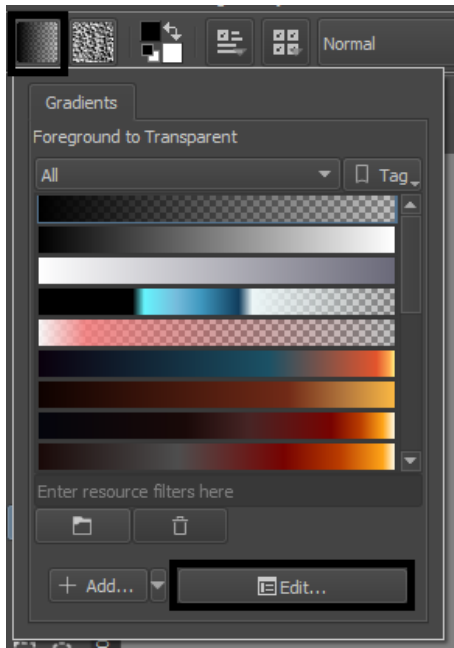
-  Gradient Tool
- Tool Options –

- Shape – Linear



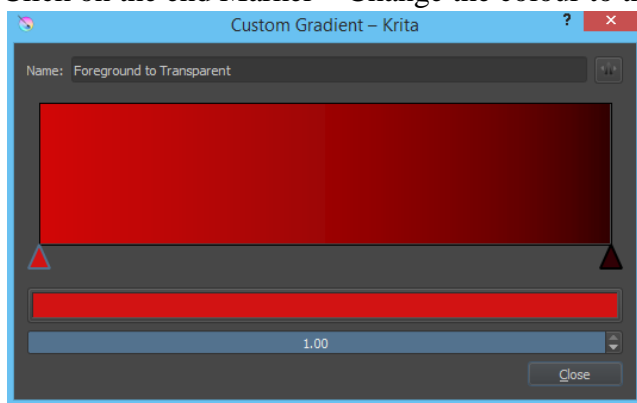
[Screenshot]

- Click on the Gradients – Click on Edit



[Screenshot]

- Click on the First Colour – Any colour [Red Colour]
- Click on the end Marker – Change the colour to the dark shade of first colour.

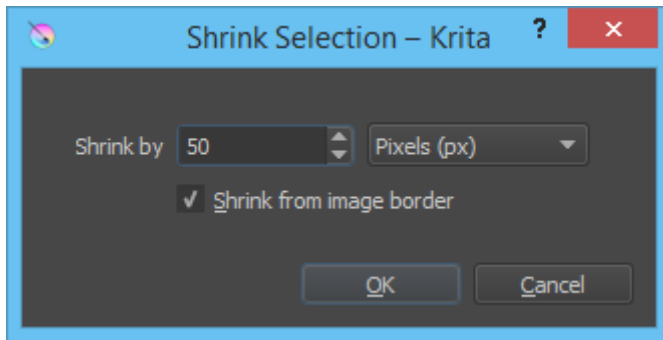


[Screenshot]

- Click and drag in the selection from top to bottom



- Select Menu – Shrink Selection by 60 pixels



[Screenshot]

- Gradient Tool
- Click and Drag from bottom to top [opposite direction of the previous]
- Select – Deselect
- The output will look like a button

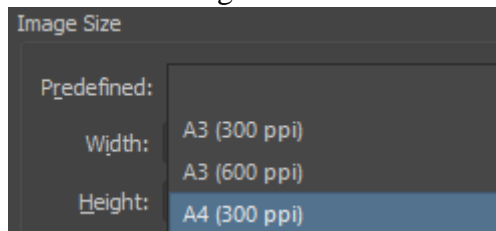


Activity 2


- Create a 3D Button out of the following colours using the same process as shown above.
 - Green Colour
 - Blue Colour

Create a Pen design using Krita


- File – New – Image Size - Predefined – A4 (300 PPI)

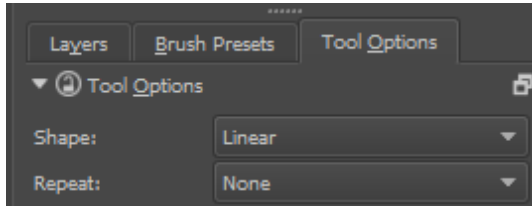


[Screenshot]

- Click on Create
-  Choose Rectangular Selection Tool
- Click and Drag on screen

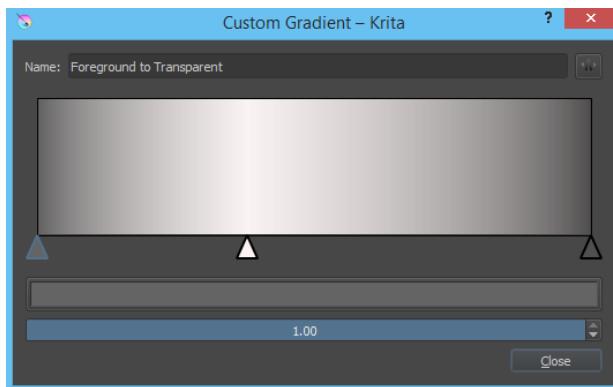


-  Gradient Tool
- Tool Options –
- Shape – Linear



[Screenshot]

- Click on the Gradients – Click on Edit
- Create a gradient as shown –



[Screenshot]

- Click and drag on the screen from left to right.



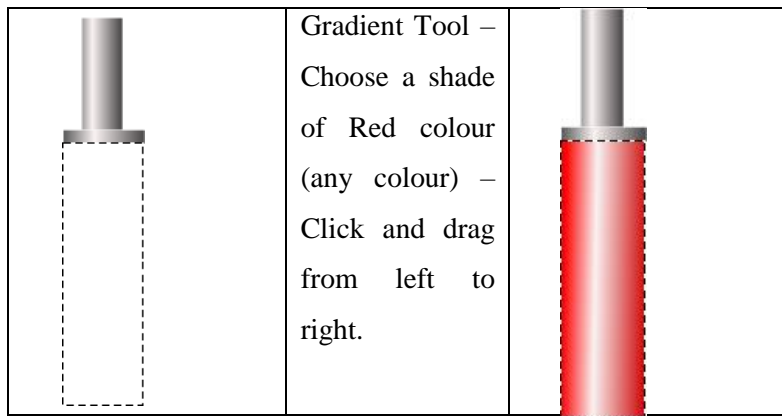
- Create a New Layer



- Select as shown
- Gradient Tool – Click and drag from left to right.
- Select – Deselect

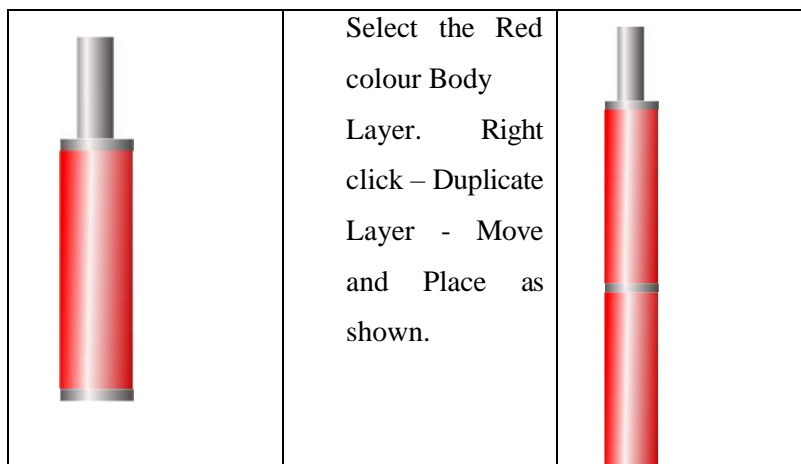


- New Layer
- Create a selection as shown




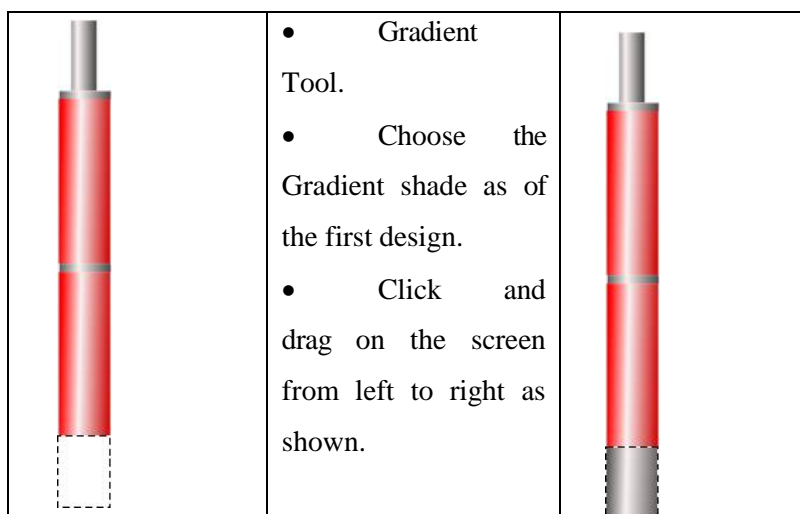
[Screenshot]


- Select the second layer containing the second design done by us. Right click on the layer – Duplicate Layer.
- Move Tool and Move as shown

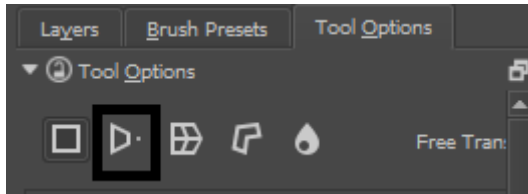


[Screenshot]

- New Layer.
-  Rectangular Selection Tool

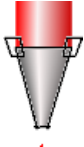


-  Transform a Layer or Selection Tool



- Tool Options - -
Perspective

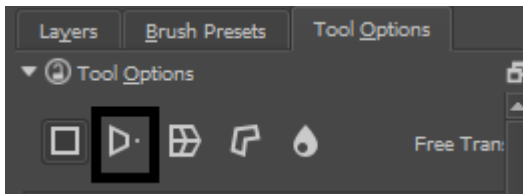
- Adjust as shown –



- New Layer
- Create a selection for the lead of the pen.
- Gradient Tool – Choose Grey shaded gradient.

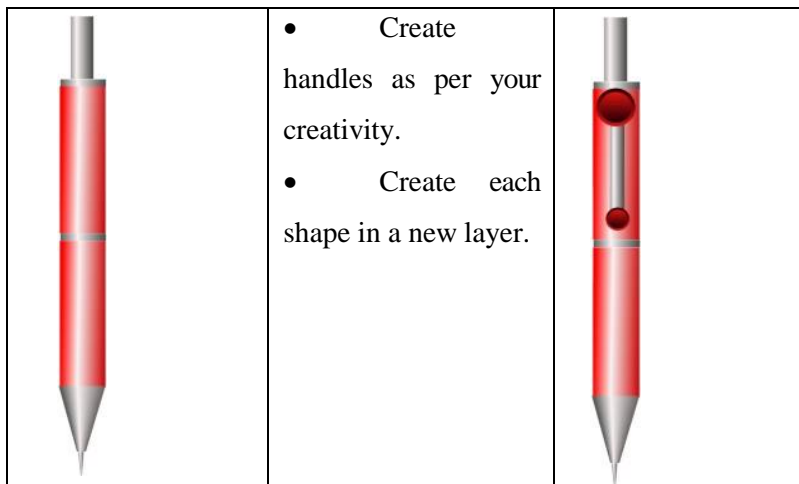


-  Transform a Layer or Selection Tool



- Tool Options - -
Perspective

- Adjust as shown –

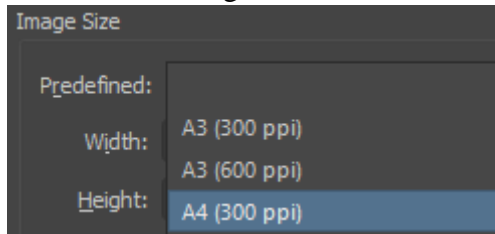


Activity 3

- Create a 3D Pen out of the following colours using the same process as shown above.
 - Green Colour
 - Blue Colour

Create a Jewellery Design using Krita

- File – New – Image Size - Predefined – A4 (300 PPI)



[Screenshot]

- Click on Create
- Create a 3D Ball using a colour in a new layer
- Create a 3D Button using a colour in a new layer



- Create duplicate copies out of the shape and arrange like Jewellery as shown.

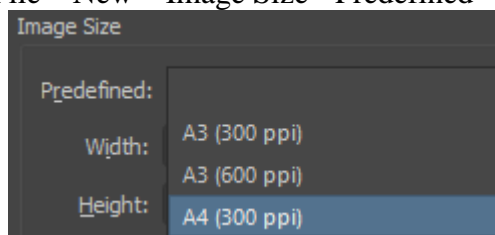


Activity 4

- Create a Jewellery Design using your own Creative idea.

Create a Digital Painting using Krita

- File – New – Image Size - Predefined – A4 (300 PPI)



[Screenshot]

- Click on Create
- Image – Rotate – Rotate Image 900 to the Right
- This will convert the canvas to Landscape.
- We have to first create a plan of contents for the design –

Planning of Layers:-

- Background – sky
- Background – Bushes
- Background – Ground
- Grass
- Clouds
- Sun
- Birds flying – silhouette
- Stones

Background sky -

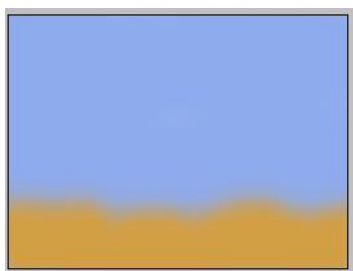
- Brush tool – choose type of brush
- Choose colour
- LC & drag on screen



[Screenshot]

Ground

- New layer
- Brush tool – choose type of brush
- Choose colour
- LC & drag on screen

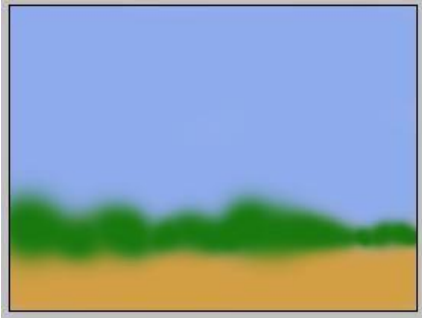


[Screenshot]

Bushes

- New layer

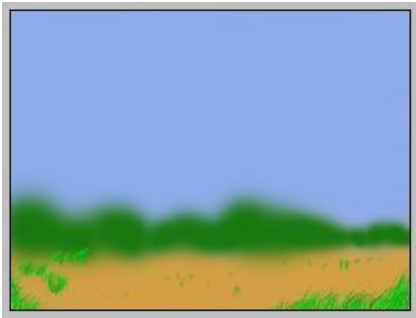
- Brush tool – choose type of brush
- Choose colour
- LC & drag on screen



[Screenshot]

Grass

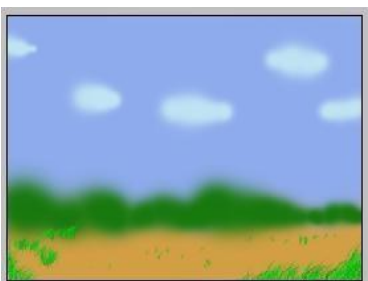
- New layer
- Brush tool – choose type of brush
- Choose colour
- LC & drag on screen



[Screensnot]

Clouds

- New layer
- Brush tool – choose type of brush
- Choose colour
- LC & drag on screen

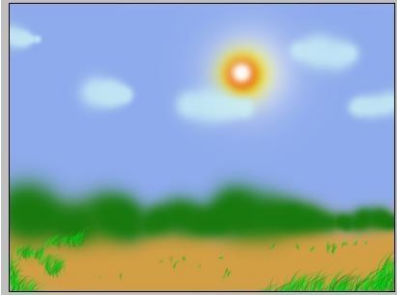


[Screenshot]

Sun

- New layer
- Brush tool – choose type of brush

- Choose colour
- LC & drag on screen



[Screenshot]

- We can interchange the position of the layers as required.

Activity 5

- Create a Digital Painting of your own as per your creativity. You can take a reference of scenery or any subject.

Create a Greeting Card Design using Krita

There has to be complete pre-production process before creating any design in software. The pre-production includes the following:

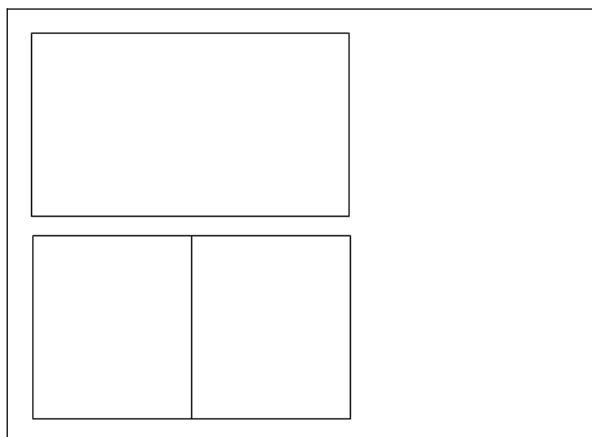
Theme of the Design

The current theme of our design is HAPPY NEW YEAR. We are going to design a card with the contents related to this theme.

Size of the Design

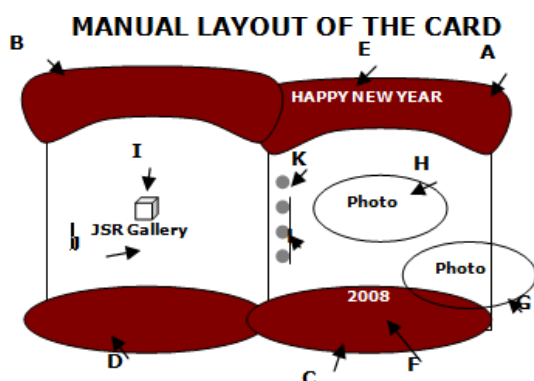
After deciding the theme, it is the time to decide the canvas size upon which the design is to be made. It has to be decided whether it would be a single sided design, a double sided design, a multiple folded design etc.

The size of the design is decided to be 10 cm x 10 cm which would be single folded. That means the size of the design will be 20 cm x 10 cm. After designing and taking the printout, the print will be folded from the center. A look at the manual layout will help in understanding the size better.



Manual Layout of the Design

After deciding the Size of the Design, the designer creates a manual layout or a sketch drawing of the proposed output.



[Created by the Author]

The draft of the greeting card will be divided into following contents: A – Upper Border of Right hand side

B – Upper Border of Left hand side

C – Bottom Border of Right hand side

D – Bottom Border of Left hand side

E – HAPPY NEW YEAR F – 2018

G – Photo in Center

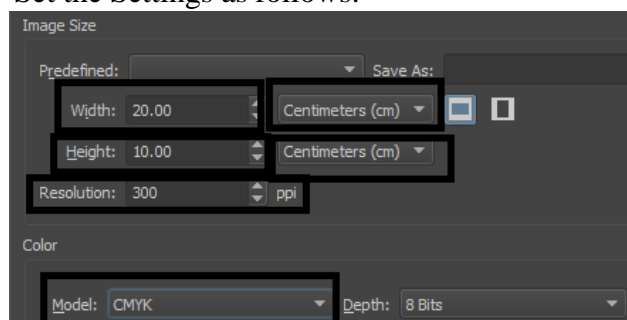
H – Logo of Gallery I – JSR Gallery

J – Ellipse Tool

K – Copy of Ellipse Tool

PRACTICAL

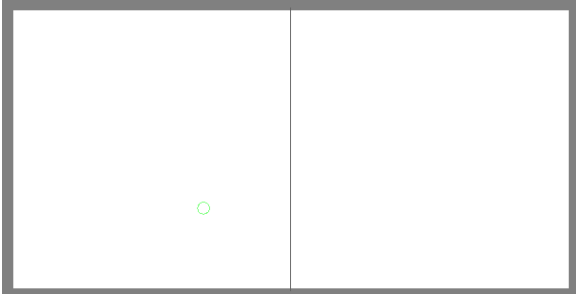
- File –New
- Set the Settings as follows:



[Screenshot]

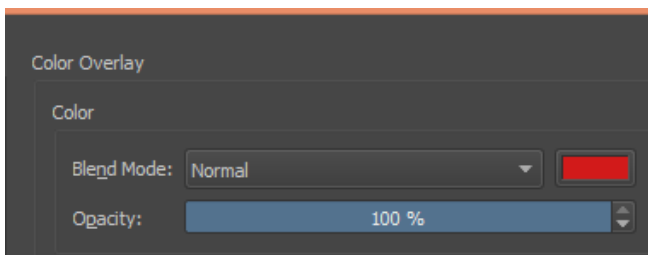
- Width – 20, Centimetres
- Height – 10, Centimetres
- Resolution – 300 ppi (pixels per inch)
- Colour Model – CMYK
- View Menu – Show Rulers

- Right Click on the Ruler Area – Change the unit to centimetres.
- Create a Vertical Guide at the center i.e. half of 20 cm = 10 cm.
- Click and drag from the vertical ruler to the 10 cm area. [You have to zoom and create it for perfection]
- You will get a grey line in the center. The line will not appear in the printout.




BACKGROUND DESIGN

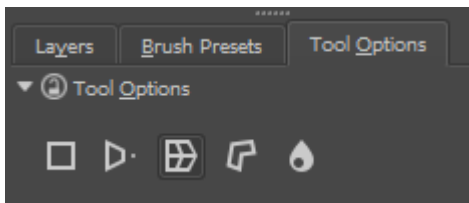
- Select any foreground colour. Press Shift + Backspace.
- Go to Layer menu – Layer Style – Colour Overlay – Choose the colour as required at any time. We can apply Gradient Overlay also.
- Blend Mode - Mix – Normal & Opacity – 100



[Screenshot]

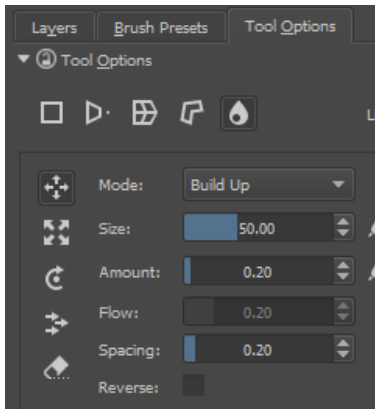
A- UPPER BORDER OF RIGHT HAND SIDE

- Create a New layer
- Create a filled rectangle with any colour
-  Transform Tool
- Tool Options – Warp Mode OR Liquify Mode



[Screenshot]

- Liquify Mode



[Screenshot]

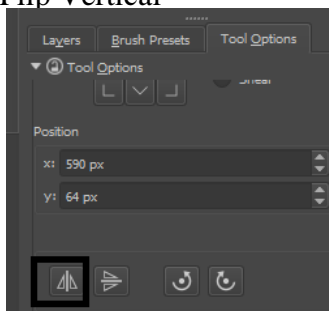
- Click on the screen over the Rectangle to do the adjustments.
- The output design will be as follows:



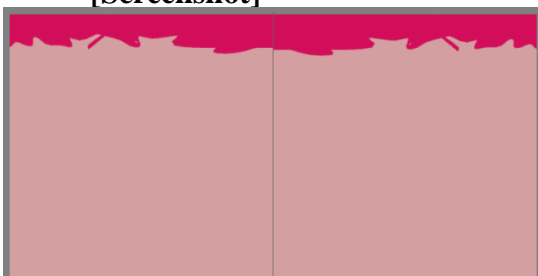
[Screenshot]

B- UPPER BORDER OF LEFT HAND SIDE

- We will create a copy of the right hand side design and create a mirror in the left hand side.
- Select the upper border of left hand side layer.
- Right Click on the Layer –Duplicate Layer
- Move Tool
- Move it to the Left hand Side
- Transform Tool
- Tool Options
- Flip Vertical

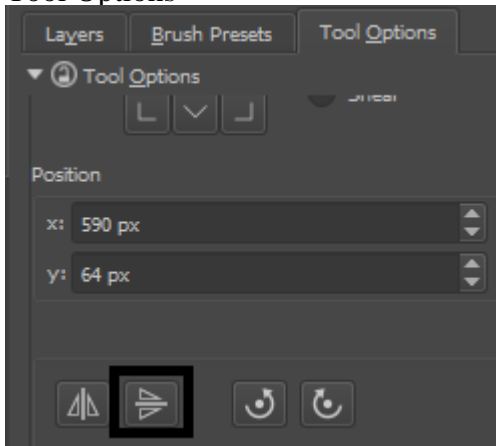


[Screenshot]



C- BOTTOM BORDER OF RIGHT HAND SIDE

- We will create a copy of the Upper right hand side design and create a mirror in the bottom right hand side.
- Select the upper border of left hand side layer.
- Right Click on the Layer –Duplicate Layer
- Move Tool
- Move it to the bottom of right hand side.
- Transform Tool
- Tool Options



[Screenshot]

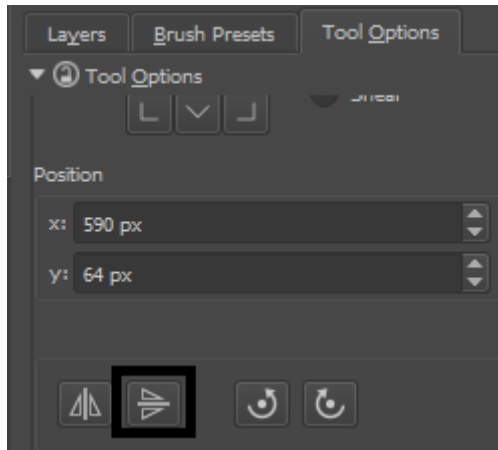
- Flip Horizontal



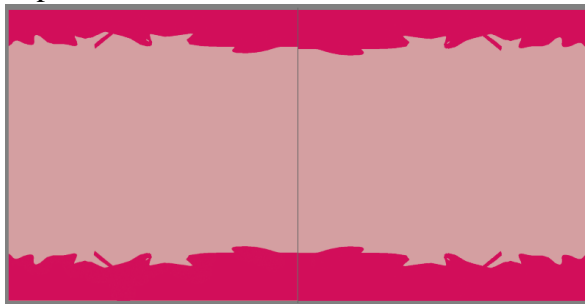
[Screenshot]

D- BOTTOM BORDER OF LEFT HAND SIDE

- We will create a copy of the Upper Left hand side design and create a mirror in the bottom left hand side.
- Select the upper border of left hand side layer.
- Right Click on the Layer –Duplicate Layer
- Move Tool
- Move it to the bottom of left hand side.
- Transform Tool
- Tool Options






- Flip Horizontal



[Screenshot]


E – HAPPY NEW YEAR



- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “HAPPY NEW YEAR”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool 

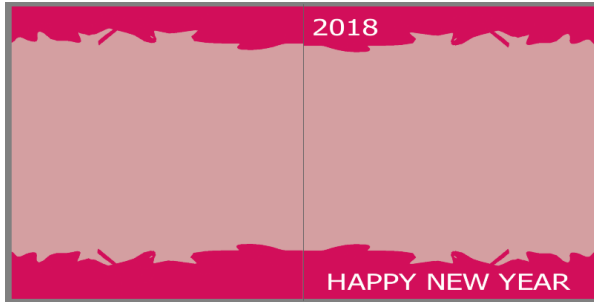


[Screenshot]

F – 2018

- Choose the  Text Tool
- Click and Drag on Screen

- Type the Text “2018”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool 



[Screenshot]

G – Photo in Center

- [Download a vector design from internet in PNG format]
- File- Open



Title: Vector Design Attribution:

Source: Freepngimg

Link: <http://www.freepngimg.com/png/18676-vector-high-quality-png>

- Select the Photo using Selection Tool
- Edit – Copy
- Go to the Greeting Card File
- Edit – Paste
- Adjust the size using the Transform Tool



[Screenshot]




H – Logo of Gallery

- File – Open [Open any Logo Design]
- Select
- Edit – Copy
- Go to the Greeting Card File
- Edit – Paste
- Resize using the Transform tool



[Screenshot]

I– Text of Gallery

- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “University Gallery”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool 



[Screenshot]

J – Ellipse Tool

- Create a New Layer
- Choose the Ellipse Tool
- Create an Ellipse



[Screenshot]

K – Copy of Ellipse Tool and Alignment

- Right click on the Ellipse Layer – Duplicate Layer 4 times
- Move the Layers and arrange as shown.



[Screenshot]

Activity 6

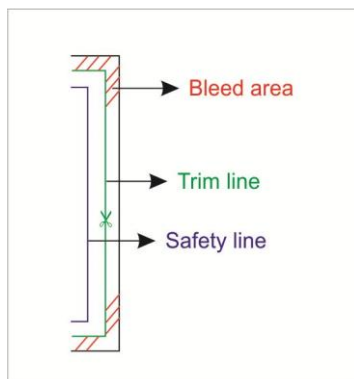
- Create a Greeting Card of your own as per your creativity. You can take a reference of designs from internet.

Create a Visiting Card Design using Krita

Size of the Design

The size of a visiting card is available in variety of sizes. The commonly used size of a visiting card is:-

Width = 9 cm & Height = 5 cm



[Created by the Author]

Extreme Corner: The extreme corner of the design.

Trim Line: Where the printer will cut your image.

Bleed Area: The area beyond the trim line that extends printing to the edge.

Safety Line: The border that contains all printable text.

We have to set a margin a visiting card. When the visiting card goes under the cutting machine, there is a possibility of deviation of a few percent either to the left or to the right. Hence, the design has to well behind the Trim line and only the extended design should be till

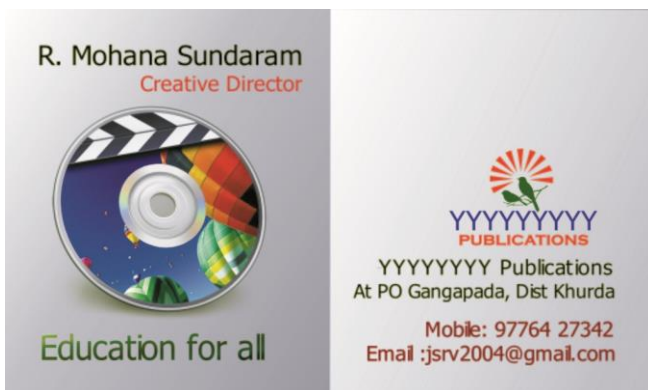
the Bleed line.

Contents of a Visiting Card

The most common elements used in a Visiting Card are as follows:

- Background design
- Name of the Company
- Logo of the Company
- Address of the Company
- Quotation or Punch line of the Company
- Name of the Person
- Designation
- Mobile Number
- E-mail Id
- Website address
- Dealing in
- Images [if required]

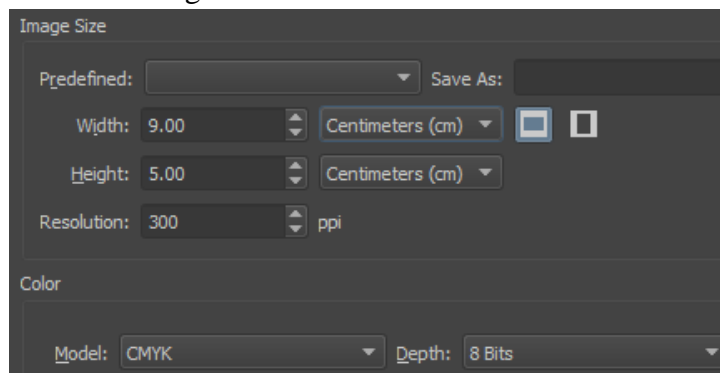
Sample Output:



[Screenshot]

PRACTICAL

- File –New
- Set the Settings as follows:

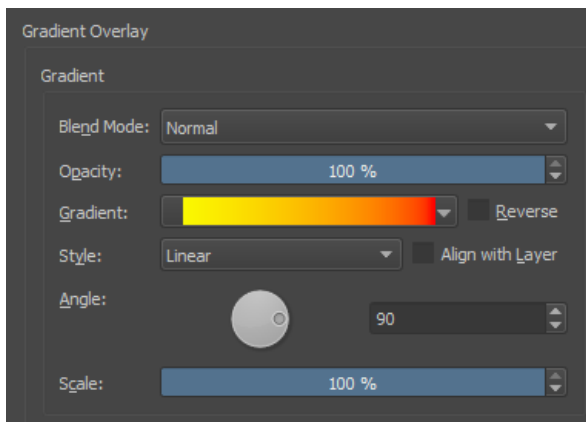


[Screenshot]

- Width – 9, Centimetres
- Height – 5, Centimetres
- Resolution – 300 ppi (pixels per inch)
- Colour Model – CMYK
- View Menu – Show Rulers
- Right Click on the Ruler Area – Change the unit to centimetres.



Background design

- Select any foreground colour. Press Shift + Backspace.
- Go to Layer menu – Layer Style – Gradient Overlay – Choose the colour as required at any time. We can apply Gradient Overlay also.
- Blend Mode - Mix – Normal & Opacity – 100



[Screenshot]

Name of the Company



- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “YYYYY Publications”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool

Logo of the Company



- File- Open [Open the logo file]
- Select the Logo using Selection Tool
- Edit – Copy
- Go to the Visiting Card File
- Edit – Paste

- Adjust the size using the Transform Tool



Address of the Company

- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “Address”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool



Quotation or Punch line of the Company

- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “Quotation”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool

Name of the Person

- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “Name of the person”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text
- Move and Place wherever required using Move Tool

Same Process for Designation, Mobile Number, E-mail Id, Website address, Dealing in etc.

- Choose the  Text Tool
- Click and Drag on Screen
- Type the Text “Designation”
- Choose the Shape Manipulation Tool 
- Tool Options
- Change the colour of the Text

- Move and Place wherever required using Move Tool

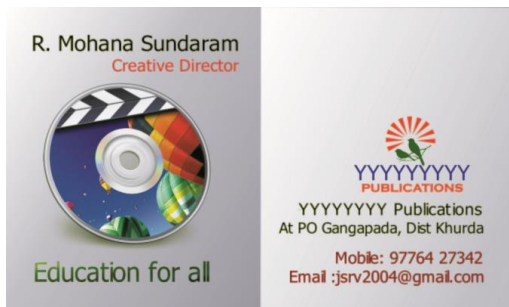
Images [if required]

- File- Open



- Select the Photo using Selection Tool
- Edit – Copy
- Go to the Visiting Card File
- Edit – Paste
- Adjust the size using the Transform Tool

The output will be as follows:



[Screenshot]

Activity 7

- Create a Visiting Card of your own as per your creativity. You can take a reference of designs from internet.

Unit summary

In this Unit we have described about a number of Professional Project Works using Krita. After learning these projects, you can identify the type of work in a project and can decide the process required for completing the project. You can create a professional output matching the standards required.

Assignment

- Create the following using Krita and Inkscape and Save it in a PNG File format.
 - 3d Ball
 - 3d Button
 - Pen Design

- Jewellery Design
- Greeting Card Design
- Visiting Card Design

Assessment

- Name the Projects done in this unit.
- Name the software used for creating the projects in this unit.
- Write (Process of converting soft copy into CD/DVD) all the above Assignments in DVD using Nero with the video output, raw source
- files of the software used and submit it to the University.

Resources

Web Reading Reference

Go through the following website for details of Krita Projects and Tutorials:

<http://www.davidrevoy.com/categorie5/tutorials>

DMA-02

Digital Imaging

Block – IV: Preparation of Digital Images using Media technologies

Unit-1 Working with Digital Images

involve the integration of live- action footage and

Introduction

Digital images have a “structure”—that is, they are built up from basic elements that are assembled in particular ways to make up a digital image. The basic unit of a digital image is the pixel, and these pixels are arranged into arrays and those arrays are arranged into one or more layers. In this unit, we will take a tour of the pixels, arrays, and layers to see how they make up a digital image.

Outcomes

Upon completion of this unit you will be able to:

- Understand Digital image, its aspects and functions
- Understand the structure of digital images, pixel, greyscale and colour images
- Understand the importance of image resolution
- Understand the texture of images

Terminology

Digital image: A digital image is a numeric representation, normally binary, of a two-dimensional image. Depending on whether the image resolution is fixed, it may be of vector or raster type.

Pixel: Pixels are the Digital images that are bifurcated in to small tiles of separate colours.

Greyscale: Grey as the name suggests are the *images with Black and White texture*, single channel images, and one colour(monochrome) images.

Colour images: These are the form of digital images that are used to deploy colour to the human eyes.

RGB: The RGB color model is an additive color model in which red, green and blue light are added together in various ways to reproduce a broad array of colors.

CMYK: The CMYK color model (process color, four colors) is a subtractive color model, used in color printing

Resolution: The quality of being determined or resolute

Textures: The projection of two-dimensional digital images in a three-dimensional object.

Aspect Ratio: Any images aspect ratio can be referred as the proportional ratio of its height and width.

Structure of digital images

Digital images maintains a "structure"— that is, they are developed from fundamental

components that are gathered in specific ways to create a digital image. Pixel is the essential unit of a digital image, and these pixels are organized into arrays and further the arrays are organized into one or multiple layers. In the accompanying, we take a voyage through those pixels, clusters, and layers to perceive how they together form a digital image.

The Pixel

Pixels are type of the Digital images that are further breached down in tosmall “tiles” of single colour. * It’s essential for the computer to have the capacity to get to every one independently keeping in mind the end goal to control it. Every pixel is likewise loaded with at least single strong shading or colour. At the point when the pixels are sufficiently little they mix together to frame a smooth picture to the eye, for example, the case of Marcie, Kodak's well known film young lady found in Figure 1-1. Notwithstanding, on the off chance that you draw nearer than the ordinary survey remove, you may begin to see her pixels, as in Figure 1-2. On the off chance that you get truly close, you can clearly see her pixels as shown in Figure 1-3.



Fig 1.1 close up



Fig 1.2 Big Close up



Fig 1.3 Extreme close up

Title-Pixel Attribution-

Source- Pexels.com

Link- <https://www.pexels.com/photo/close-up-photography-of-woman-wearing-red-lipsticks-765193/>

Basically Pixels have two important traits fundamental to the computer.

First To begin with, they are composed in flawless little rows and columns like a checkerboard, and in the land of computer this is known as array. After the pixels get organized into an array kin this manner itsmandatory for the computer to have the capacity to find them.

There are two positions

- a) The classic horizontal direction: The horizontal position of a pixel in an array is referred to as its position in “X”.
- b) The classic vertical direction:its vertical position is referred to as “Y”.

By this way each pixel is provided with aspecific location, or “address,” in X and Y. or instance, in the event that you had a picture that was 100 pixels wide and 100 pixels tall, you could distinguish the correct area of a particular pixel by saying it was 50 columns more than (50 in X) and 10 rows down (10 in Y). In short it could be said its XY location is 50, 10. This pixel will be different from its neighbour that is present, one column to the right at 51, 10, or in

the row below at 50, 11. Indeed, every pixel will have a specific XY location in the image and can be denoted by the computer, in the same manner, which it is.

The next important trait is that a pixel is having its single colour. As defined a pixel is all one solitary colour. In a pixel variation of colour or textures are not permitted. Every pixels colour is represented by a number. Truth be told, pixels are basically sets of defined numbers representing colours that are organized in clear rows and columns. They are turned in to picture only when the numbers are converted into colours by a display device like TV set or computer monitor.

*The word Pixel is gotten from "pix" a slang truncation for "pictures", and "el" originates from "component", so the pixel signifies "picture component".

Greyscale Images

Black and white images, one channel images, and monochrome (one color) images are the other names of Greyscale Images. The assortment of names is because of the way that few diverse technical disciplines have built up their own terms to depict a similar thing. Historically it emerges from many discipline so this occurs frequently in computer graphics. Here we shall call them as greyscale images for better clarification and brevity. Due to their simple attribute Greyscale images are used commonly in computer graphics, they are a perfect method to effortlessly approach the subject of digital images. They exhibit just a single channel, or layer, whereas color images have three channels or more, which we shall come across shortly.

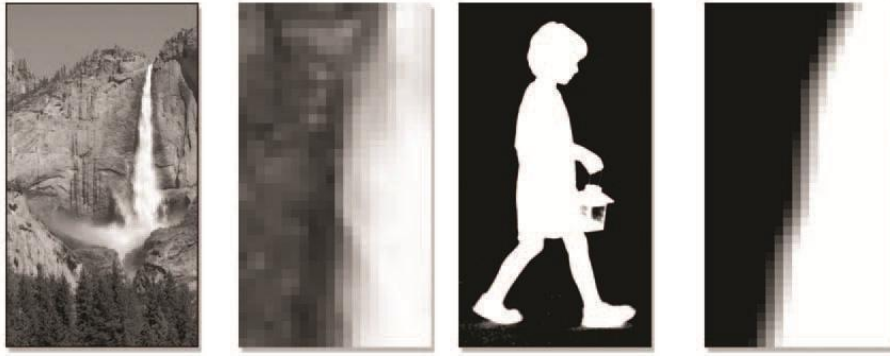
Digitization of a black and white picture can be one case of a greyscale image is, and the next more pertaining case are the majority of the *matte* on the planet. Mattes may be utilized to compose one picture above the other. The latter cases are outlined in Figure 1-4. These pictures don't have any colour as they are greyscale images. Even though differences in appearance of the two images the common is that both of them are one-channel images. Here one channel, or layer, implies that the images comprised of only one array of pixels with the values of brightness ranges from black to white and shades of grey.

Greyscale image Close up pixels Matte Close up pixels

Fig 1.4 Examples of greyscale images and their pixels

29	29	50	109	163	184	191
33	30	46	120	269	138	204
32	40	66	134	180	196	213
34	38	78	148	185	203	217
35	29	72	153	187	205	229
35	22	77	163	184	205	230
33	29	88	167	181	203	223

Fig 1.5 An array of pixels



When we see this one channel array of pixel it can be interpreted as close and personal, Figure 1-5 zooms in to a tiny little region of pixels in the greyscale image of Figure 1-4. The numbers in Figure 1-5 are the *code values* of each pixel. These can be referred as code values on the grounds that encoding or measuring the numerical values, the splendor of every pixel. The dim chip that each numerical values encode, or quantify, the brightness of each pixel. The grey chip that each code value sits on speaks to how brilliant that pixel will show up when shown on a screen. Internally the computer utilizes the code values that are arranged in to an array for representation of the picture. The important thing here to focus is that just one array of code values exists, which is known as a channel, and the code values are concerned only with brightness, and not colour.

Color Images

In the actual world our eyes can see the entire spectrum or range of colour however in reality our eyes, are sensitized for three colors of light that is red, green, and blue. Since our brain "blends" segments of these three hues we could see other colours like yellow, magenta, and cyan. Take an example, red and green are blended to get yellow. A similar trap is utilized as a part of the majority of our picture are displayed in devices such as television, led panel displays, digital projectors, and feature film. Actually all these gadgets projects only red, green and blue colours that is coordinated in our brain and integrated as each and every colour shades of the rainbow. To make a colour display device for humans, all you need is red, green, and blue, which is abbreviated RGB.



RGB Image Red Channel Green Channel Blue Channel

Fig 1.6 A RBG image is made of up 3 channels

Until and unless the digital images have RGB data on them the human eyes could not see the colours of digital images displayed over the screen. In the past segment, we came across about the working of the greyscale images, the way it uses its solitary single channel and since

it's been made from the arrangement of numbers in single array that in turn represents the brightness values of the pixel from black to white.

By and large now we will be using three channels and now we can assign one of these colours to each channel, say one to red, other to green and last to blue. Now we can put distinct code values in these three channels of each pixel which in turn is going to enable us to allocate a specific RGB code value to every pixel. This scheme will allow us to assign a unique RGB code value to each pixel in our colour image by putting different code values in the red, green, and blue channels of each colour pixel. We now have a colour image composed of three channels, which is referred to as an RGB image, as illustrated in Figure 1-6. Note how the yellow paint cans in the RGB image appear bright in the red channel, medium in the green channel, and dark in the blue channel. Having these different values in each channel is what gives the image its colours.

Even though in the RGB image every channels data represents different values of red, green or blue colour pixel per pixel but if we see the data the data is in different hues of grey. This is because of the reason that the different shades of grey depicts the amount of brightness of that particular channel of every pixel. You could observe this in the Figure 1-7:

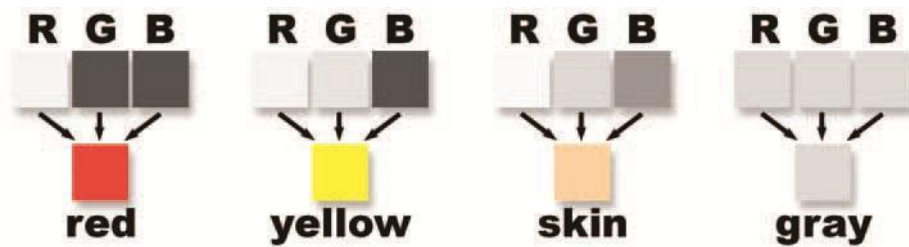


Fig 1.7 Grey RGB data becomes colour

If we see the extreme left you could see the red pixel, containing the red chip coded as “R” appears to be very bright whereas the Green and Blue pixel consisting of green and blue chips, coded as

Suppose there is plenty of red and minute amount of green and blue that indicates the colour is red. next to the red we have yellow pixel that has bright R and G values above it, but a low (dark) B value, which is the quintessential definition of yellow. The skin tone chip shows a more typical RGB combination to make a common skin tone color. Lastly the grey pixel demonstrates a unique case. In the event that every one of the three of the RGB esteems are the same, than grey color is produced. Indeed, this defines grey that every one of the three channels having parallel estimations of brightness. At the point when the RGB estimations of a pixel happens to be unique in relation to each other, this forms hues or colour.

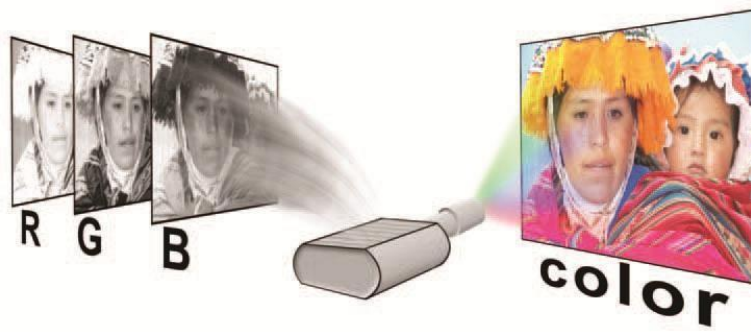


Fig 1.8 Grey RGB data gets its colour from the display device

In an event that the RGB information is entirely grey or in black and white, then from where the colours are visible in a coloured image? The answer is the generation of the colour is originated from display like digital projector, TV, LED screen, etc. As shown in Figure 1-8. For instance in a digital projector for the red channel the grey data is fed to the red lamp of a digital projector as a result of which the whole screen is filled with adequate amount of red light at every pixel. Same way The green and blue data go to their respective lamps. after this all the images of red, blue and green superimpose on each other that makes the eyes to see the colour. Important aspect here is to be noted basically a colour image is a three channel image where in each channel it consists of distinct RGB data in every channel. The key point to note from this is a shading picture is a three-channel picture that contains isolate RGB information into each channel, but the data in these channels is, indeed grey.

Adobe Photoshop will conveniently outline now. To visualise the effect upload a color photographic kind picture into Photoshop (not a convenient graphic). Select the Channels palette (it should be noted in the Photoshop software also they are called as channels), at that point close up the visibility (the eyeball icon) for every channel with the exception of the Red channel. You ought to be watching a gray image. Currently click on the inexperienced channel and view the other, however completely different, grey image. Attempt the Blue channel.

It's completely different another time. It's vital to consider RGB pictures as 3 channels of grey data just since that's however the PC thinks of them. To master digital

compositing, you would like to understand however the PC assumes therefore you'll think over it.

Four-Channel Images

A three-channel RGB image will be made as a four-channel image if a matte is enclosed within it that's placed in an exceedingly fourth channel. This newly formed four-channel image is named as *alpha channel* that is denoted by letter "A," and then onward this four-channel image is named as a RGBA image.

A three-channel RGB image can have a matte included with it that is placed in a fourth channel, making it a four-channel image. This fourth channel is called the *alpha channel*, which is represented by the letter "A," so a four-channel image is referred to as a RGBA image. CGI is

a case of an RGBA image, it is displayed in Figure 1-9. Likewise it's totally conceivable to have pictures with more than four channels, yet you will plausibly experience them later in your profession..



Attributes of digital images

Now that we have already discussed about the digital images models or structures, additionally we could investigate the different characteristics of digital images. Not only they appear in different shapes and sizes but also, in the internal representation of the image and data variations exist. So this segment will basically begin with digitizing an image in order to know about it. After that we shall know in length about the distinction between display aspect ratio, image aspect ratio, and pixel aspect ratio—3 extremely confusing ideas. This will elaborate all the essential points and clarify all doubts.

Digitizing Images

Despite the fact that they play out a tremendous assortment of capacities, by the day's end, whatever they can do is control numbers (in addition to a little Boolean logic en route). Thus, they take a shot at must be changed over to numbers or whatever we load or feed in is lessened to numbers. Even if to create a text file such as a text message, email, a book or a word processor document each letter of the alphabet is assigned with a defined number. The audio files after conversion to numbers to create MP3 files only could be played or listened over DVDs, iPods, , and other MP3-enabled devices. In addition, the photos must be changed over to numbers before the PC can work with them. On the off chance that it isn't first changed over to numbers, the PC basically can't manage it.

When a picture or an audio say a sound track is converted in to numbers or digits the phenomenon known as *digitizing*. After completion of the digitization of the image, a PC after having the digitized image, any work becomes possible. The two important concepts that should be clear on digitizing images are:

- The first is how the entire process is done.
- The second are what issues occurred during the process and how to

resolve them.

- Following example will explain both points on analysis of the digitized image.

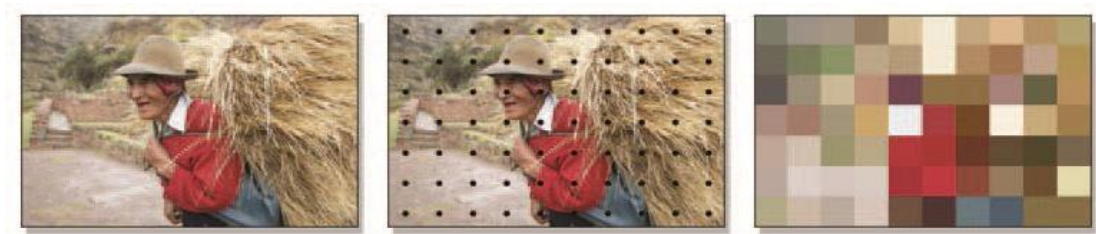


Fig 1.10 Original Picture

Fig 1.11 Sampling points

Fig 1.12 Digitized picture

Image Resolution

Dot per pixel or DPI is thought as resolution. Image resolution refers to how {many|whatpercentage|what number} pixels wide and the way many pixels tall image is. Let's say, if a picture were three hundred pixels wide and three hundred pixels tall, the image resolution would be 300 by 300, or written as 300×300 . The PAL video image features a resolution of 720×576 component. A regular academy aperture feature frame has a picture resolution of 1828×1332 . The pictures from a photographic camera might need a picture resolution of 3072×2048 or additional.

Notice that nothing was mentioned about the “size” of the image. This is on account of the real display size of a picture changes relying upon the display device it is seen on. The display size can vary, but the NTSC and PAL image resolution remains the same i.e. 720×486 & 720×576 respectively. Say the projection of a small movie or a feature film, can be done on a small screen in a small theatre, or on a huge screen in a large auditorium. Here again the difference is in display size, but in case of a 35 mm film image resolution remains intact and same. We do need to be cautious here in light of the fact that the term *resolution* has an altogether different meaning in other disciplines. The typical significance for the word outside of digital compositing isn't what number of pixels are there in the whole picture, yet what number of pixels are there in per unit of display—that is, what number of pixels per inch or dots per centimetre.

Image Aspect Ratio

The aspect ratio of an image is defined by the aspect ratio of a picture is really a portrayal not of its size or its resolution, but rather of its shape. It depicts whether the picture is tall, thin, or low and wide. Each picture on your PC will have a built up aspect proportion, and image resolution, and all your work must comply with it. The aspect ratio is essentially the proportion of the picture's width to its tallness, so it is computed by partitioning the picture's width by its height. For example, if the image resolution is 400×300 , divide 400 by 300 the

aspect ratio thus obtained will be 1.33, the classic video resolution. It should be noted that the image aspect ratio can be applied on image file, but by this it could not be predicted that how it's going to look on the final display. There are instances that the image aspect ratio and its display aspect ratio may differ. We will discuss this in coming topics.

Pixel Aspect Ratio

As we know that the digital images contains pixel.as in images the pixels have a defined shape which is again denoted by its image- aspect ratio. You should make a point that all pixels are not equal. Like in a square pixel, same as a square image, shall have a pixel aspect ratio of 1.0, however there are lot of display systems that don't have square pixels. Figure 1-13 shows the non-square pixel aspect ratios you may commonly come across in production.



Fig 1-13 Common pixel aspect ratios

Explanation of the above figure:

The left example shows an NTSC (American television) video pixel that has a pixel aspect ratio of 0.9, making it tall and thin.

The middle image describes a PAL (European television) video pixel that has a pixel aspect ratio of 1.1, that makes it short and wide.

Generally square pixels are found in many feature film format, but the Cinema Scope (Cscope) format is a specific widescreen format that has a pixel aspect ratio of 2.0, making its pixels too wide. Luckily, video formats of all HDTV (High Definition Television) consists of square pixels.

Display Aspect Ratio

So by this time it's been clear that the image aspect ratio depicts the images shape and the pixel aspect ratio depicts the pixels shape. And these two factors integrate and referred as the *display aspect ratio* i.e. the images shape after being projected through a display device. The significance of the Display aspect ratio is that, there may be variance in the aspect ratio of the image and the display device on which the image is displayed. This variation is caused because of the pixel aspect ratio. If the pixels are square, then the image aspect ratio and the display aspect ratio are identical.

Texture

When two-dimensional color pictures are projected in three- dimensional object it is known as texture. A 3D model of the scene can be constructed from a single image, without

knowing the layout of common surfaces of the scene, as done in previous works. The understanding of texture of objects improves object detection.

Scene interpretation is a long-standing, basic problem in computer vision. Recent work demonstrates that a synergistic treatment of diverse image-understanding tasks, including object recognition, image segmentation, and 3D-scene reconstruction, may overcome many errors induced by addressing them in isolation. These approaches typically fuse object detections with supervised priors of spatial layouts of common scene surfaces (e.g., the sky is on the top, and the ground is planar and horizontal).

While holistic scene interpretation shows great promise, the treatment of the 3D scene layout in existing work has certain shortcomings. First, they make the restrictive assumption that surfaces in the scene are planar, and discredited surface orientations into a pre-specified number of classes (e.g., buildings may face only left, right, or front). Second, they typically estimate surface orientation classes too locally (e.g., per each super pixel), without accounting for the long-range spatial relations among image parts. This may easily lead to implausible 3D layouts.

One visual cue that has been overlooked, and that could address the aforementioned shortcomings of prior work, is texture arising from a spatial repetition of objects in the scene. In general, textures of recurring objects are ubiquitous. For example, windows on a building facade jointly give the percept of window texture, and a sequence of cars parked along a street gives rise to car texture, as illustrated in Fig 1. In a cafeteria scene, tables and chairs, and people standing in a line comprise many distinct textures. Also, in natural scenes, one can easily find textures corresponding to flocks of birds, herds of animals, or tree lines.

Summary

This unit gave an introduction to the basics of digital images. It elaborated the structure of digital images and other key elements like pixels, greyscale images, colored images, RGB and four scale images. It also discussed the various attributes of the digital images like, digitizing images, image resolution, image aspect ratio display aspect ratio and the basics of image texture.

Assessments

1. What are pixels?
2. RGB is made of how many channels? Mention them.
3. What is image aspect ratio?
4. What is picture aspect ratio?
5. What is display aspect ratio?

Resources

1. Wright, Steve. *Compositing visual effects: Essentials for the aspiring artist*. Taylor & Francis, 2011.
2. Payet, Nadia, and Sinisa Todorovic. "Scene shape from texture of objects." *Computer Vision and Pattern Recognition (CVPR), 2011 IEEE Conference on*. IEEE, 2011.

Unit 2 Managing file formats for Images

Introduction

We come across a lot of images and each image is either shared or received by user and delivered to a client or colleague. These images are present in the form of a file, and files are available in a massive form of completely different formats. It's a true facility in front of you, where you have to apply your wisdom while choosing the file formats. We should be cautious about the selection because of the following reasons:

Firstly because if you send a file or receive a file from someone in a specific format that the software or programme could not read, you will be lost and end your start there itself.

Secondly if you choose the file formats via which your image file gets compressed then the image quality may be compromised or degraded. Sometimes your selection may work and sometimes it may not work.

Thirdly, if you pick a wrong file format the file size may increase, more than your requirement. Many people don't want to unnecessarily waste their disk space, download time, network bandwidth, and production time.

Outcomes

Upon completion of this unit you will be able to:

- Understand the basics of image file formats
- Understand the basics of file compression
- Realize the importance of Dots per inch in digital images
- Know the basics of EXR

Terminology

File: A computer file is a computer resource for recording data discretely in a computer storage device. Just as words can be written to paper, so can information be written to a computer file?

File Format: A file format is a standard way that information is encoded for storage in a computer file.

Graphics: Graphics are simple images created or drawn with designing software's.

Photographic images: These are real scenes captured by some kind of camera, either digital or film.

JPEG: It is a floating-point image file format developed by Industrial Light & Magic (ILM). JPEG or Joint Photographic Experts Group is an older lossy compression file format specifically designed for photographic images.

Compression: It reduces the size of the file so that it can be shared conveniently.

DPI: DPI is used to describe the resolution number of dots per inch in a digital print

Image file formats

Before taking a gander at the file formats, there are a couple of key ideas to think about certain picture writes and pressure plans. In this segment, we will investigate the contrasts between photographic pictures and designs on the grounds that the kind of picture you have powerfully influences the decision of the pressure plot. The EXR file formats gets its own particular extraordinary say due to its rising significance in the visual impacts industry.

Photographic Images vs. Graphics

There are extremely two noteworthy kinds of images: Photographic images and graphic images. Photographic images are genuine scenes caught by some sort of camera, either digital or film. Their key element is that their pixel esteems fluctuate significantly everywhere throughout the picture, in this way making them "complex." Graphics, then again, are straightforward images made or drawn with designing programming's, for example, Adobe Photoshop, Adobe Illustrator, Coral Draw, indesign, and so forth. The key component is that their pixel esteems don't fluctuate more over the image.

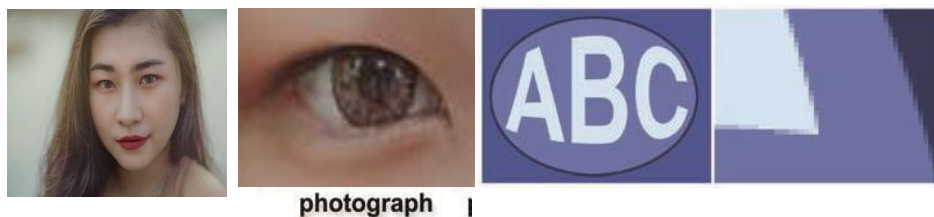


Fig 2.1 Pictures and graphics have very different pixels variations

Figure 2.1 shows this significant distinction between the two kinds of pictures at the pixel level. In the nearby of photo, no two pixels are of a similar shading(colour). In the graphic close-up there are substantial regions of indistinguishable pixel esteems. These distinctions are utilized while choosing a compression scheme. A lossless sort of compression would be utilized on the realistic in light of the fact that the document size could be packed by exploiting every one of the pixels of a similar esteem. Such a plan would be futile on the photo and result in for all intents and purposes no document size lessening. A lossy pressure plan would detectably harm the graphic, yet can go unnoticed in the photo if not squeezed too far. **Indexed Color Images (CLUT)**

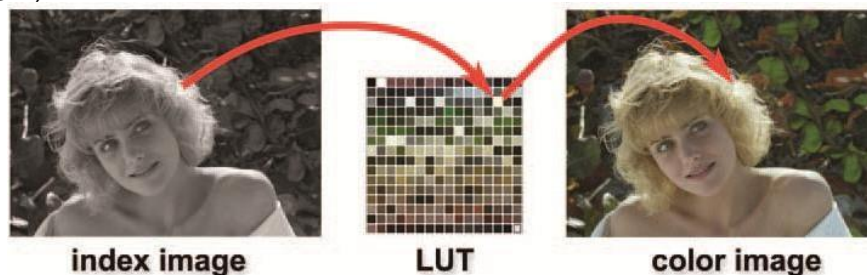


Fig 2.2 an indexed color image

The document size of any RGB image can be extensively diminished by changing over

it to an ordered shading image. The PC initially completes a factual examination of all the RGB hues in the image and afterward delivers a Look-Up Table (LUT) of just 256 hues, which speak to the nearest 256 midpoints of the considerable number of hues in the RGB image. It at that point makes a one-channel 8-bit "index" image where every pixel is extremely a pointer or index to one of the hues in the shading(colour) table. To show the image in colour the PC takes a gander at every pixel in the index image, takes after that file to its shading chip in the LUT, understands that RGB esteem, and shows it on the screen as the red arrows appear in Figure 2.2

Despite the fact that the scope of hues is genuinely lessened (256 hues rather than 16 million), the subsequent colours image looks shockingly great (in the event that you don't look too carefully). The Marcie colours image in Figure 2-2 is a genuine index colours image. this is because the look is so great is that the 256 hues in the LUT are full 24-bit RGB esteems. Since there are just 256 of them, they don't expand the file size extensively. A typical shortening for index colours images is CLUT, that represents Color Look up Table.

CLUT images work exceptionally well for graphics, particularly if the graphics has under 256 hues in it. The CLUT form would then be a lossless pressure. Photographic images can be changed over to a CLUT, obviously, yet they get severely pounded all the while during the process. it might be OK for a website, however not for printing a 8×10 portrait.

Compression

All file formats offer some sort of data compression feature. A few sorts of data compression are lossless, implying that as soon as the compressed file is opened, the image is a correct imitation of the first. Be that as it may, some compression schemes are lossy, implying that the compressed image has endured a few misfortunes, or corruption.

Two transcendent lossless compression plans are RLE and LZW. Run Length Encoding (RLE), which is quite often utilized for rendering CGI pictures; and, Lempel-Ziv-Welch (LZW), that is essential since it is accessible in a considerable number image file formats. Since these are lossless compression plans, they lessen file measure with no debasement of the image; moreover, they can likewise be utilized together. Utilize them unreservedly on CGI and graphics realizing that they won't hurt your photos. Photographic pictures can utilize LZW, however there will be negligible compression.

Two transcendent lossy compression plans are JPEG and MPEG-2. The JPEG compression is proposed for still photographic pictures and fundamentally evacuates fine detail in the picture to lessen its file size. It debases the picture quality, and if set too high can corrupt it genuinely. The MPEG-2 compression is particularly intended for moving pictures, for example, video. It begins by playing out a JPEG-type compression on chosen key frames, and after that it shrinks the middle frames by developing a rundown of distinctions between the key

frames.

EXR

Open EXR, or EXR, is a drifting point image file format created by Industrial Light and Magic (ILM) that is quick turning into an industry standard. It's likely that you may experience it right off the bat in your digital compositing vocation and more probable after some time, so how about we investigate it intently. The following area discusses the different essential image file formats, however EXR is both remarkable and sufficiently vital to get its own spot in the sun, particularly in light of the fact that it was particularly created in viewing the compositors. Here is an outline of its primary highlights:

- High powerful range: - Designed particularly to oblige high unique range image data, for example, film checks and photorealistic CGI components. The dynamic range (darkest to brightest) of a normal screen may be around 150 to one and projected film maybe 2000 to one, whereas EXR's dynamic range is over a billion to one!
- Many channels: - when the basic CGI render is a four-channel image, EXR is expandable to any number of channels. The reason for existing is to abstain from rendering the many obstacles or passes of a CGI subject into multiple separate files. They would all be able to be in their own channels inside one EXR file.
- Lossless compression: - Designed for including feature film work, film outlines are extensive photographic images that take up a considerable disk space and network or system exchange time. A special lossless compression plot is bolstered that slices file sizes down the middle with no corruption to the image and it is quick to compress and uncompress.
- Short float: - A floating point format, however rather than the standard 32-bit drift, actualizes a novel 16-bit "short buoy." This understands the speed punishment as a rule related with floating point, while keeping up all that could possibly be needed exactness notwithstanding for include film work. At the end of the day, it gives a speed of number with the exactness of float.

Open EXR was discharged by ILM to the world as an open standard for nothing in 2003 keeping in mind the end goal to quickly spread it into the visual impacts industry. It has worked. Many 3D animation and compositing programs now bolster EXR. It has even entered to the omnipresent programming resembles Adobe After Effects and Adobe Photoshop.

We can't talk about each file format in the entire library as that would be a whole epic book. Rather this topic comprise of a leniently concise portrayal of a few of the most widely recognized and imperative file formats we go over regularly being a compositor.

File Formats

As we are well aware that in order to recognize an image we need to add extension to the file name to know what is the format that the file belongs to. In the event that the file is in TIFF format, for instance, the file name will appear as "filename.tif," a JPEG picture would be named "filename.jpg," et cetera. In view of this, the file formats are recorded beneath in sequential order arrange in view of their filename expansions.

- .bmp: An adaptable Microsoft Windows image file format that backs the two photos and graphics. These images are saved as 8 or 16 bits, BW, RGB, RGBA, and CLUT. No compression.
- .cin: Cineon is a more seasoned, extremely particular file format particularly for 10-bit log film scans. No compression, no choices, and nothing specific. It underpins BW, RGB, and RGBA pictures.
- .dpx: Digital Picture Exchange, a newly introduced file format for 10-bit log film scans that is supplanting the Cineon format. Assists numerous channels, linear and log data, and multiple bit depths. sometimes HDTV video frames are saved in the .dpx format.
- .exr: Short form of Open EXR, Industrial Light and Magic's (ILM) broadened extensive range file format basically designed to work for images of feature film. It highlights floating point information and the colossal vibrant scope of hue and bright required for top- quality element film work.
- .gif: Most generally observed as a 8-bit CLUT file format basically used for graphics that is broadly utilized for the web. Incorporates assist for animation in a single file and doles out one CLUT hue for hard-edged transparency. It additionally assists 8-and 16-bit images, BW, RGB with lossless compression, yet no one appears to mind.
- .jpg: JPEG, or Joint Photographic Experts Group, is a more established lossy compression file format particularly intended for photographic images. The fundamental component is the capacity to dial in the measure of compression to influence the file to estimate smaller, which likewise influences how much image data is lost. Unreasonable compression causes genuine loss of image quality and presents antiquities or artifacts.
- .jp2: JPEG 2000, a more up to date lossy compression file format, which is additionally particularly intended for photographic images. In view of a totally unexpected innovation in comparison to JPEG, it compresses image files to a littler size while presenting less rarities or artifacts.
- .mov: Apple's pervasive QuickTime motion image file format is utilized to store moving images. The QuickTime file format is really a "wrapper" that assists a not insignificant

rundown of conceivable compression plans called codecs (Coder/Decoder). While numerous projects can read QuickTime films, inconvenience comes when the motion picture (movie) is packed with a codec that the program endeavoring to peruse or read the file doesn't have.

- .png: The Microsoft Windows variant of a .gif file that assists genuine transparency.
- .psd: Adobe Photoshop file format that assists isolate layers for the different components of a image. Expected for Photoshop image altering, it isn't assisted by numerous different projects.
- .tga: Targa, a Microsoft Windows-based file format that assists CLUT, BW, RGB, RGBA, 8 bits for each channel, and lossless compression.
- .tiff: - TIFF, the most vital image file format in light of the fact that it is assisted by for all intents and purposes each digital imaging program in the whole world. It is a to a great degree adaptable and completely attributed file format that assists various channels, 8-and 16-bit images, and lossless compression. Perfect for CLUT, BW, RGB, RGBA, illustrations, photos, CGI, and practically every other image write aside from a compacted photo (utilize JPEG or JPEG 2000).
- .yuv:- A file format particularly for video frames. Numerous projects can read .yuv files and change over them to RGB for show on the screen, and the resulted outcome will be a .yuv file.

Dots per inch (dpi)

The idea of dpi is utilized as a part of print media for books and magazines and so forth. It is vital to talk about dpi, or "dabs per inch," while examining computerized images is basically on the grounds that it is a consistent wellspring of perplexity and confusion in visual impacts. Dpi is likewise appeared in Adobe Photoshop in the Image Size dialogue box as "Resolution." with regards to printing, resolution implies what number of pixels are printed per inch of paper. With regards to advanced compositing, determination implies the width and tallness of a image in pixels.

In the event that you have a image that is 100 pixels wide and it will be imprinted in a magazine as a 1-inch wide image, you would clearly have 100 pixels spread crosswise over one inch of paper. In this way, the photo would have a print determination of 100 pixels for each inch. For respecting print custom, it would really be alluded to as 100 dpi (dabs per inch). Presently assume you have a 500-pixel image and its print will be a five inch image. The resolution would even now be 100 dpi in light of the fact that in one inch of image despite everything you have 100 pixels. Don't bother the way that the photo is five inches wide. In any case, assume your 500-pixel image was printed as a one inch image. You would now have a 500

dpi image since 500 pixels are spread more than one inch. For a given image width in pixels, the littler it is printed, the more pixels per inch, the more prominent the dpi. For a settled image measure, the higher the dpi the more honed the image will be. (see Figure 2-3)



Fig 2.3 Increasing the dpi makes the picture sharper

One can really watch this in real life in Photoshop. Upload a image, and after that go to the "Image Size" dialogue box. To start with, uncheck "Resample Image" present in the bottom side. Now its going to advice Photoshop to not to change the image "Pixel Dimensions: Width or Height" (what we computerized typesetters call image resolution). Presently go to the "Resolution" window and there you enter or change a number and note that the values change the "Document Size: Width and Height". Next change the values of "Width or Height" and observe the change in the "Resolution" value. What exactly the phenomenon is that the image width and height were locked with the goal that the real pixel counts will not get altered while adjusting the dpi to perceive how the subsequent image will be printed bigger or littler on paper.

This story has two focuses. The primary point is that if an image is made in Photoshop for a visual impact shot, the question may arise that what the dpi should be. The appropriate

response should be dpi is unessential. By this it clarifies that the Width and Height of the image in pixels that are imperative to us. This will jumble some Photoshop specialists whose orientation is more towards printing. Secondary point is that when images are produced from a visual results shot to Photoshop or to print, (for example, PR photographs), this may likewise bring up the issue of the dpi. A casing of film or video from a visual impacts shot has no natural dpi. Which consists of just Width and Height in pixels. But at the time of printing it should be allotted a dpi to set how lengthy the image will be printed. The dpi value and image printing is complementary to each other. The higher the dpi is set the littler the image will print. For instance, if a 600×300 image was relegated a dpi of 300 the printout will be 2 inches wide. Be that as it may, on the off chance that it is set at 600 dpi the print will be in one inch of paper.

Unit Summary

This unit gave detailed knowledge regarding the Managing File formats for images, import and export techniques. It elaborated the basics of file formats and dots per inch importance in digital images. Also discussed about the photographic images vs Graphics, indexed colour images, EXR; the industry standard and the basics of EXR. It also explained the importance of compression in digital images.

Assessment

1. What are indexed colour images?
2. What is the importance of EXR?
3. What are the various digital image file formats?
4. What is DOT and discuss its importance in digital image?
5. What is DPI?
6. True or False
 - a. Increasing the DPI makes the image less sharp
 - b. GIF is a video format
7. What is full form of the commonly used JPEG format?

Resources

1. Wright, Steve. *Compositing visual effects: Essentials for the aspiring artist*. Taylor & Francis, 2011.
2. https://en.wikipedia.org/wiki/Image_file_formats

Unit 3 Image Editing with GIMP

Introduction

Gimp is an acronym for GNU Image Manipulation Program. Gimp is a freely distributed piece of software suitable for such tasks as photo retouching, image composition and image authoring. It is an extremely capable piece of software with many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing system, a mass production image renderer, an image format converter and more. Gimp is expandable and extensible. It is designed to be augmented with plug-ins and extensions to do just about anything. The advanced scripting interface allows everything to be easily scripted, from the simplest task to the most complex image manipulation procedures.

This unit will elaborate the various applications of Gimp and demonstrate the step by step process of editing photographs utilizing it.

Outcomes

Upon completion of this unit you will be able to:

- Edit photographs using the advance techniques layer like blend and the exposure tools of the Gimp.
- Blend two different exposures of the same scene combined to get the best parts of both images.

Terminology

GIMP: GIMP (/gimp/ *GHIMP*) (GNU Image Manipulation Program) is a free and open-source raster graphics editor used for image retouching and editing, free- form drawing, converting between different image formats, and more specialized tasks.

Masking: Layer **masks** are a fundamental tool in image manipulations. They allow you to selectively modify the opacity (transparency) of the layer they belong to. This differs from the use of the layer Opacity slider as a **mask** has the ability to selectively modify the opacity of different areas across a single layer.

Quick Mask: The Quick Mask allows you to paint a selection instead of just tracing its outline.

Layers: A GIMP image is as a stack of transparencies: in GIMP terminology, each individual transparency is called a layer.

What is GIMP?

Gimp is an acronym for GNU Image Manipulation Program. Gimp is a freely distributed piece of software suitable for such tasks as photo retouching, image composition and image authoring. It is an extremely capable piece of software with many capabilities. It can be used as a simple paint program, an expert quality photo retouching program, an online batch processing

system, a mass production image renderer, an image format converter and more. Gimp is expandable and extensible. It is designed to be augmented with plug-ins and extensions to do just about anything. The advanced scripting interface allows everything to be easily scripted, from the simplest task to the most complex image manipulation procedures.

Features and capabilities

A brief list of Gimp features:

- Full suite of painting tools including brushes, a pencil, an airbrush, cloning, etc.
- Tile-based memory management so image size is limited only by available disk space.
- Sub-pixel sampling for all paint tools for high-quality anti-aliasing.
- Full Alpha channel support.
- Layers and channels.
- A procedural database for calling internal Gimp functions from external programs, such as Script-Fu.
- Advanced scripting capabilities.
- Multiple undo/redo (limited only by disk space).
- Transformation tools including rotate, scale, shear and flip.
- File formats supported include GIF, JPEG, PNG, XPM, TIFF, TGA, MPEG, PS, PDF, PCX, BMP and many others.
- Load, display, convert and save to many file formats.
- Selection tools including rectangle, ellipse, free, fuzzy, bezier and intelligent.
- Plug-ins that allow for the easy addition of new file formats and new effect filters

Basic GIMP Concepts

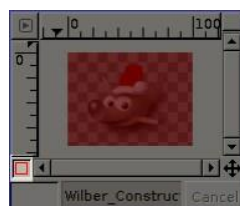
This section is intended to give you a brief introduction to the basic concepts and terminology you will need to understand in order to use Gimp.

Working with Images

Image types It is tempting to think of an image as something that corresponds with a single display window, or to a single file such as a JPEG file, but really a Gimp image is a rather complicated structure, containing a stack of layers plus several other types of objects: a selection mask, a set of channels, a set of paths, an "undo" history, etc. The most basic property of an image is its mode. There are three possible modes: RGB, greyscale, and indexed.

Quick Mask

Screenshot



The selection tools sometimes show their limits when they have to be used for creating a complex selection. In these cases, using the Quick Mask can make things much easier. Simply put, the Quick Mask allows you to paint a selection instead of just tracing its outline.

Layers

A good way to visualize a GIMP image is as a stack of transparencies: in GIMP terminology, each individual transparency is called a layer. There is no limit, in principle, to the number of layers an image can have: only the amount of memory available on the system. It is not uncommon for advanced users to work with images containing dozens of layers. The organization of layers in an image is shown by the Layers dialog, which is the second most important type of dialog window in GIMP, after the Main Toolbox. The appearance of the Layers dialog is shown in the adjoining illustration. How it works is described in detail in the Layers Dialog section, but we will touch on some aspects of it here, in relation to the layer properties that they display.

Each open image has at any time a single active drawable. A "drawable" is a GIMP concept that includes layers, but also several other types of things, such as channels, layer masks, and the selection mask. (Basically, a "drawable" is anything that can be drawn on with painting tools.) If a layer is currently active, it is shown highlighted in the Layers dialog, and its name is shown in the status area of the image window. If not, you can activate it by clicking on it. If none of the layers are highlighted, it means the active drawable is something other than a layer. In the menu bar above an image window, you can find a menu called Layer, containing a number of commands that affect the active layer of the image. The same menu can be accessed by right-clicking in the Layers dialog.

Undoing

Almost anything you do to an image in GIMP can be undone. You can undo the most recent action by choosing Edit Undo from the image menu, but this is done so frequently that you really should memorize the keyboard shortcut, Ctrl Z.

Undoing can itself be undone. After having undone an action, you can redo it by choosing Edit Redo from the image menu, or use the keyboard shortcut, Ctrl Y. It is often helpful to judge the effect of an action by repeatedly undoing and redoing it. This is usually very quick, and does not consume any extra resources or alter the undo history, so there is never any harm in it.

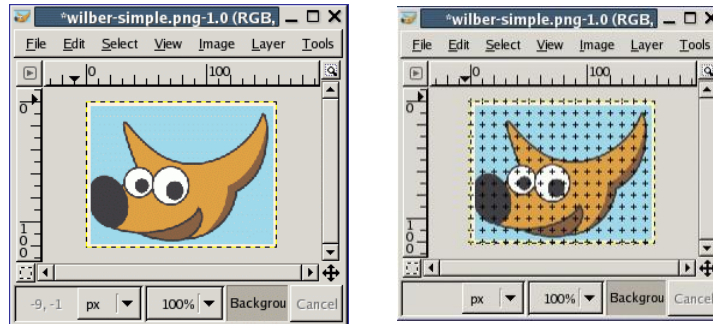
If you undo one or more actions and then operate on the image in any way except by using Undo or Redo, it will no longer be possible to redo those actions: they are lost forever. The solution to this, if it creates a problem for you, is to duplicate the image and then operate on the copy. (Not the original, because the undo/redo history is not copied when you duplicate an

image.)

Grids and Guides

You will probably have it happen many times that you need to place something in an image very precisely, and find that it is not easy to do using a mouse. Often you can get better results by using the arrow keys on the keyboard (which move the affected object one pixel at a time, or 25 pixels if you hold down the Shift key), but GIMP also provides you with two other aids to make positioning easier: grids and guides.

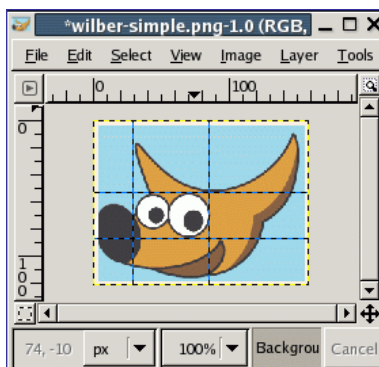
Image Grid



Screens hot

Each image has a grid. It is always present, but by default it is not visible until you activate it by toggling View Show Grid in the image menu. If you want grids to be present more often than not, you can change the default behaviour by checking "Show grid" in the Image Window Appearance page of the Preferences dialog. (Note that there are separate settings for Normal Mode and Fullscreen Mode.)

Guides



Screenshot

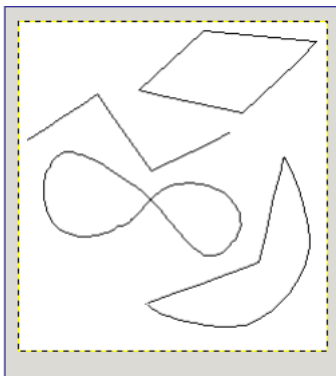
In addition to the image grid, GIMP also gives you a more flexible type of positioning aid: guides. These are horizontal or vertical lines that you create by clicking on one of the rulers and dragging into the image. You can create as many guides as you like, positioned wherever you like. To move a guide after you have created it, activate the Move tool in the Toolbox (or

press the M key), you can then click and drag a guide.

To delete a guide, simply drag it outside the image. Holding down the Shift key, you can move everything but a guide, using the guides as an effective alignment aid. As with the grid, you can cause the pointer to snap to nearby guides, by toggling View Snap to Guides in the image menu. If you have a number of guides and they are making it difficult for you to judge the image properly, you can hide them by toggling View Show Guides. It is suggested that you only do this momentarily; otherwise you may get confused the next time you try to create a guide and don't see anything happening.

Paths

A path is a one-dimensional curve.

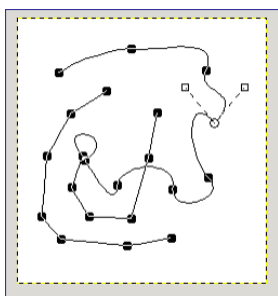


Screenshot

Paths are used for two main purposes:

- A closed path can be converted into a selection.
- An open or closed path can be stroked, that is, painted on the image, in a variety of ways.

Paths can be created and manipulated using the Path tool. Paths, like layers and channels, are components of an image. When an image is saved in GIMP's native XCF file format, any paths it has are saved along with it. The list of paths in an image can be viewed and operated on using the Paths dialog. If you want to move a path from one image to another, you can do so by copying and pasting using the popup menu in the Paths dialog, or by dragging an icon from the Paths dialog into the destination image's window.



Brushes



Screenshot

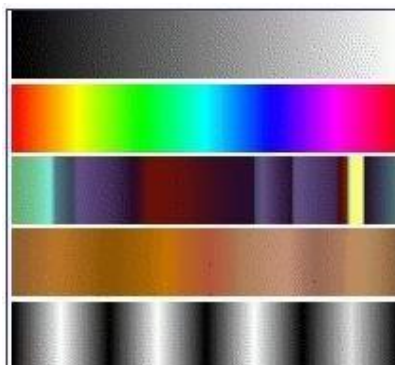
A brush is a pixmap or set of pixmaps used for painting.

GIMP includes a set of 10 "paint tools", which not only perform operations that you would think of as painting, but also operations such as erasing, copying, smudging, lightening or darkening, etc. All of the paint tools, except the ink tool, use the same set of brushes. The brush pixmaps represent the marks that are made by single "touches" of the brush to the image.

A brush stroke, usually made by moving the pointer across the image with the mouse button held down, produces a series of marks spaced along the trajectory, in a way specified by the characteristics of the brush and the paint tool being used. Brushes can be selected by clicking on an icon in the Brushes dialog. GIMP's current brush is shown in the Brush/Pattern/Gradient area of the Toolbox. Clicking on the brush symbol there is one way of activating the Brushes dialog.

Gradient

A gradient is a set of colors arranged in a linear order. The most basic use of gradients is by the Blend tool, sometimes known as the "gradient tool" or "gradient fill tool": it works by filling the selection with colors from a gradient. You have many options to choose from for controlling the way the gradient colors are arranged within the selection. There are also other important ways to use gradients.



Screenshot

When you install GIMP, it comes presupplied with a large number of interesting gradients, and you can add new ones that you create or download from other sources. You can access the full set of available gradients using the Gradients dialog, a dockable dialog that you

can either activate when you need it, or keep around as a tab in a dock. The "current gradient", used in most gradient- related operations, is shown in the Brush/Pattern/Gradient area of the Toolbox. Clicking on the gradient symbol in the Toolbox is an alternative way of bringing up the Gradients dialog.

Patterns

A pattern is an image, usually small, used for filling regions by tiling, that is, by placing copies of the pattern side by side like ceramic tiles. A pattern is said to be tileable if copies of it can be adjoined left-edge-to-right-edge and top-edge-to-bottom-edge without creating obvious seams. Not all useful patterns are tileable, but tileable patterns are nicest for many purposes. (A texture, by the way, is the same thing as a pattern.)

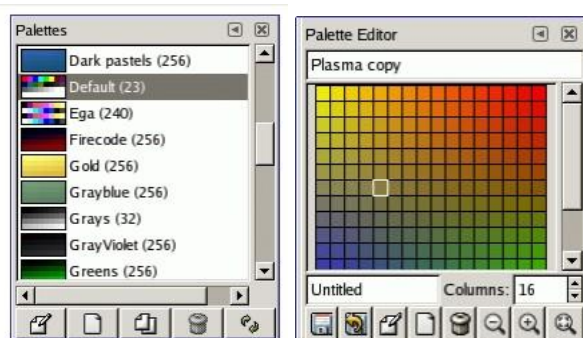


Screenshot

In GIMP there are three main uses for patterns:

- With the Bucket Fill tool, you can choose to fill a region with a pattern instead of a solid color.
- With the Clone tool, you can paint using a pattern, with a wide variety of paintbrush shapes.
- When you stroke a path or selection, you can do it with a pattern instead of a solid color. You can also use the Clone tool as your choice if you stroke the selection using a painting tool.

Palettes



Screenshot

A palette is a set of discrete colors. In GIMP, palettes are used mainly for two purposes:

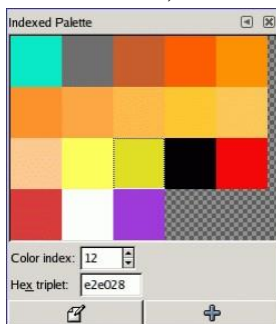
- They allow you to paint with a selected set of colors, in the same way an oil painter works with colors from a limited number of tubes.

- They form the color maps of indexed images. An indexed image can use a maximum of 256 different colors, but these can be any colors. The color map of an indexed image is called an "indexed palette" in GIMP.

Actually neither of these functions falls very much into the mainstream of GIMP usage: it is possible to do rather sophisticated things in GIMP without ever dealing with palettes. Still, they are something that an advanced user should understand, and even a less advanced user may need to think about them in some situations, as for example when working with GIF files.

Colormap

GIMP makes use of two types of palettes. The more noticeable are the type shown in the Palettes dialog: palettes that exist independently of any image. The second type, indexed palettes, forms the color maps of indexed images. Each indexed image has its own private indexed palette, defining the set of colors available in the image: the maximum number of colors allowed in an indexed palette is 256. These palettes are called "indexed" because each color is associated with an index number. (Actually, the colors in ordinary palettes are numbered as well, but the numbers have no functional significance.)

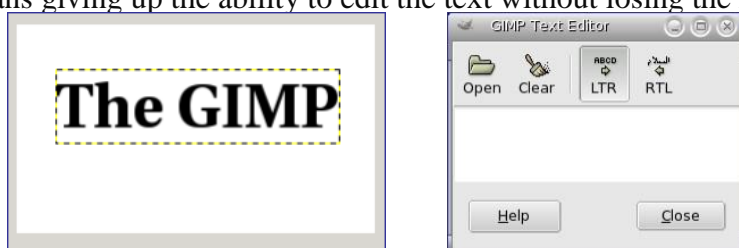


Screenshot

Text and Fonts

One of the greatest improvements of GIMP 2.0 over GIMP 1.2 is in the handling of text. In GIMP 2.0 and 2.2, each text item goes in a separate Text layer, and you can come back later to the layer and edit the text in it. You can also move the text around in the image, or change the font, or the font size. You can use any font available on your system. You can control justification, indentation, and line spacing.

Actually, you can operate on a text layer in the same ways as any other layer, but doing so often means giving up the ability to edit the text without losing the results of your work.



Screenshot

Files

The GIMP is capable of reading and writing a large variety of graphics file formats. With the exception of GIMP's native XCF file type, file handling is done by plug-ins. Thus, it is relatively easy to extend GIMP to new file types when the need arises. Not all file types are equally good for all purposes. This part of the documentation should help you understand the advantages and disadvantages of each type.

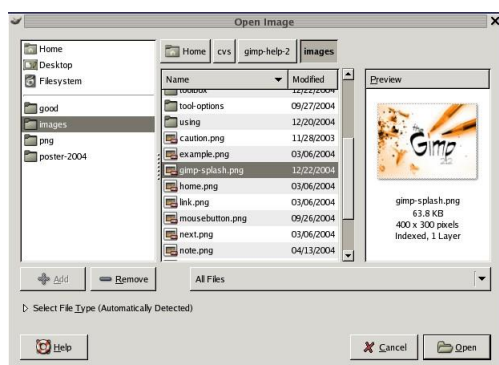
Creating new Files

You can create new files in GIMP by using the following menu item: File New. This opens the Create a new image dialog, where you can modify the initial width and height of the file or using the standard values. More information about this dialog can be found in.

Opening Files

There are several ways of opening an existing image in GIMP:

- **Open File** The most obvious is to open it using a menu, by choosing File Open from either the Toolbox menu or an image menu. This brings up a File Chooser dialog, allowing you to navigate to the file and click on its name. This method works well if you know the name of the file you want to open, and where it is located. It is not so convenient if you want to find the file on the basis of a thumbnail.



Screenshot

Saving Files

There are several commands for saving images. A list, and information on how to use them, can be found in the section covering the File menu. GIMP allows you to save the images you create in a wide variety of formats.

Screenshot

It is important to realize that the only format capable of saving all of the information in an image, including layers, transparency, etc., is GIMP's native XCF format. Every other format preserves some image properties and loses others. When you save an image, GIMP tries to let you know about this, but basically it is up to you to understand the capabilities of the format

you choose.

Using the Quic kmask

Open an image or begin a new document;

Activate the Quick mask using the left-bottom button in the image window. If a selection is present the mask is initialized with the content of the selection;



Choose any drawing tool. Paint on the Quick Mask using black color to remove selected areas and white color to add selected areas.

You can use grey colors to get partially selected areas. You can also use selection tools and fill these selections with the Bucket Fill tool. This does not destroy the Qmask selections!

Toggle off the Quick mask using the left-bottom button in the image window: the selection will be displayed with its marching ants.

Creating New Layers

There are several ways to create new layers in an image. Here are the most important ones:

Selecting Layer New Layer in the image menu. This brings up a dialog that allows you to set the basic properties of the new layer; see the New Layer dialog section for help with it.

Selecting Layer Duplicate Layer is in the image menu. This creates a new layer that is a perfect copy of the currently active layer, just above the active layer.

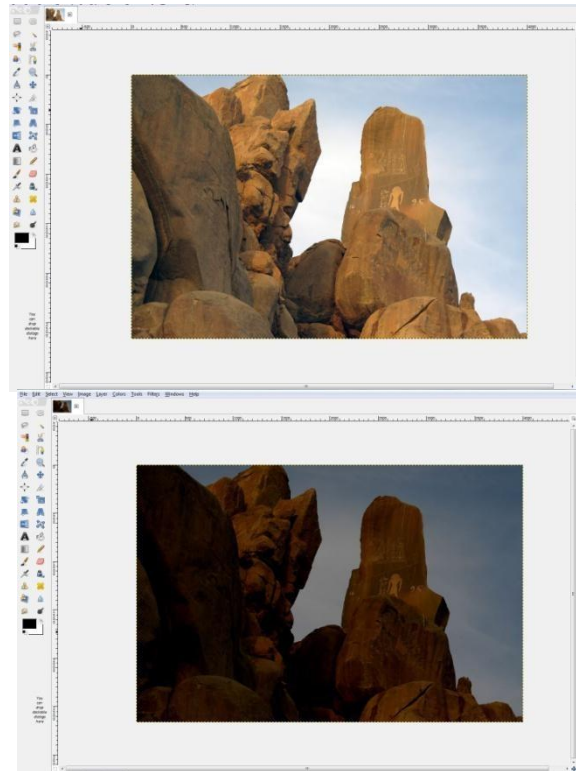
When you "cut" or "copy" something, and then paste it using Ctrl- V or Edit Paste, the result is a "floating selection", which is a sort of temporary layer. Before you can do anything else, you either have to anchor the floating selection to an existing layer, or convert it into a normal layer. If you do the latter, the new layer will be sized just large enough to contain the pasted material.

Working with Digital Camera Photos

The Procedure

The basic technique is to create a layer above the image that contains the other exposure of the same scene. Finally, apply a layer mask to the thin layer which makes parts of the image transparent to shown in image below.

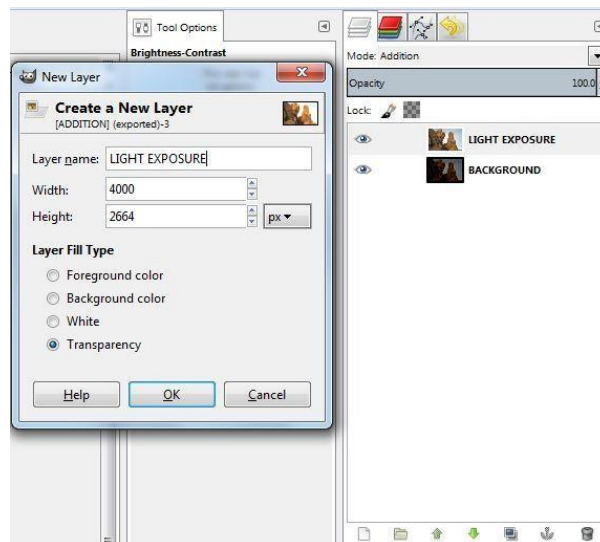
Step 1



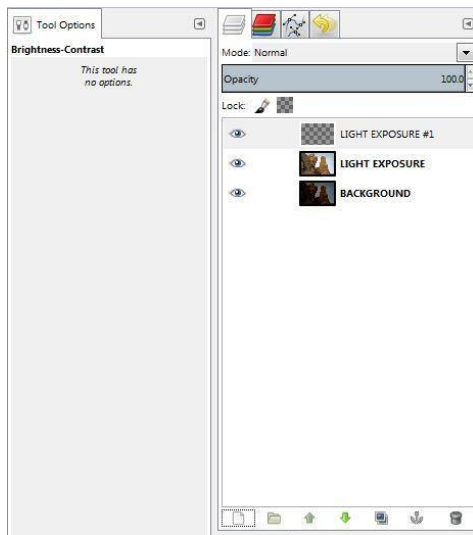
Screenshot

Step 2

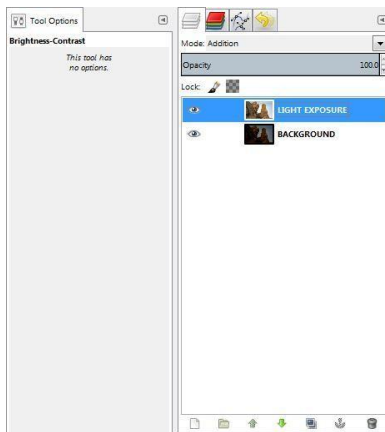
Here are the two exposures, loaded into GIMP. Sandwich these on different layers and then combine them with a layer mask.



Screenshot



Screenshot

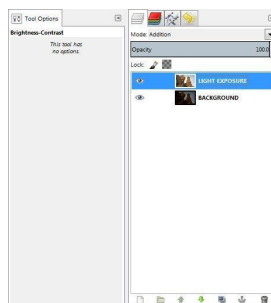


Screenshot

The first decision is which one goes on top. In this case the decision is to put the lighter image on top and the darker one on the bottom. The reason is because is that these are hand-held shots, and are far from aligned. Move the bottom image until the arch is aligned as best.

Go the image that is going to be on the bottom. Open the Layers dialog (Ctrl+L) and click on the new layer button () to create a new layer.


Step 3



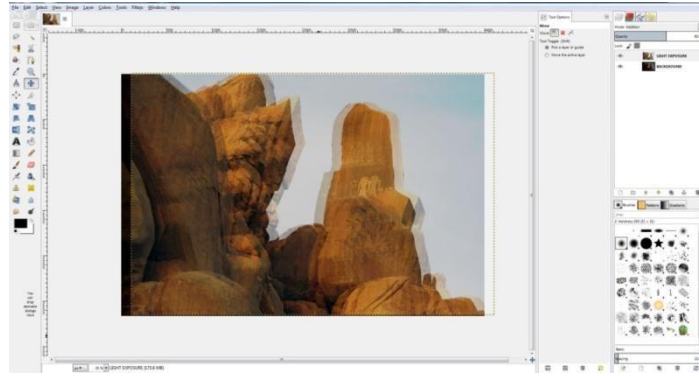
Screenshot

Go to the image that is going to be on top. Select all and copy (Ctrl+Athen Ctrl+C).

In the Layers dialog, make sure the new layer is selected, then go to the bottom image

window and paste (Ctrl+V). In the Layers dialog, click on the anchor button () to anchor the floating image.

Step 4

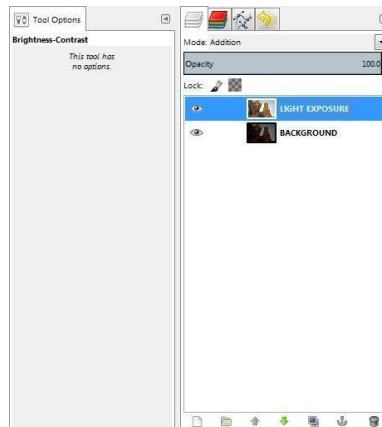


Screenshot

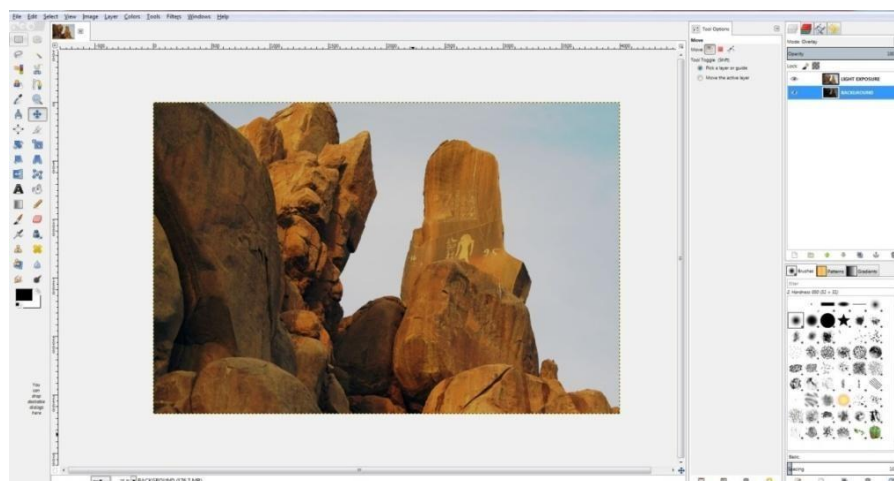
Crank down the opacity of the upper layer so that you can see both images.

If, they are perfectly aligned you can skip the next step. Unless you used a digital capture on a tripod, the images probably need to be aligned. (Even if you had a film camera on a tripod, it is difficult to get two successive scans to feed through in perfect alignment.)

Step 5



Screenshot

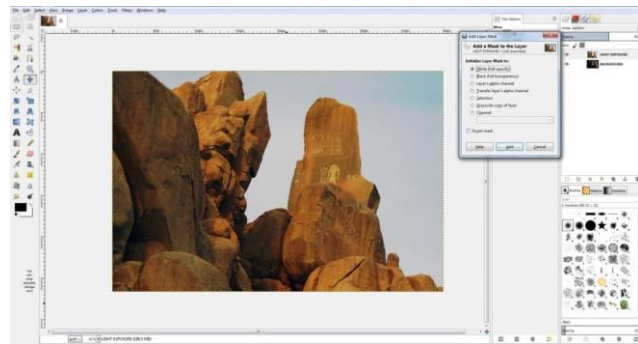


Screenshot

In the Layers dialog, select the layer you need to move or rotate. In this case it is the lower layer. Using the arrow keys, nudge the image into alignment. You may need to rotate the image slightly too. When you get close to alignment, zoom in to get a good close-up view and

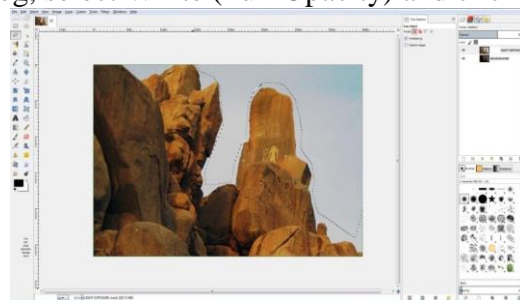
get the best possible fit.

Step 6



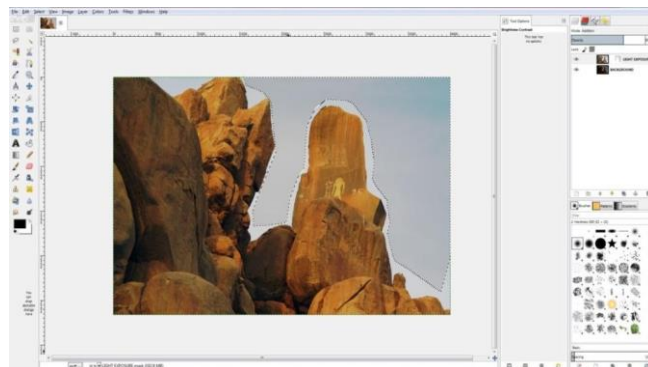
Screenshot

In the Layers dialog, right-click on the upper layer and select Add Layer Mask. In the Add Mask Options dialog, select White (Full Opacity) and click OK.



Screenshot

Step 7

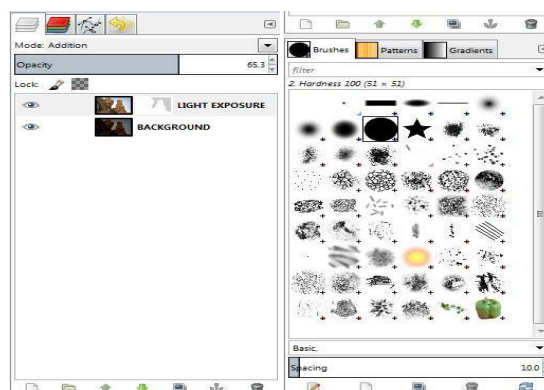


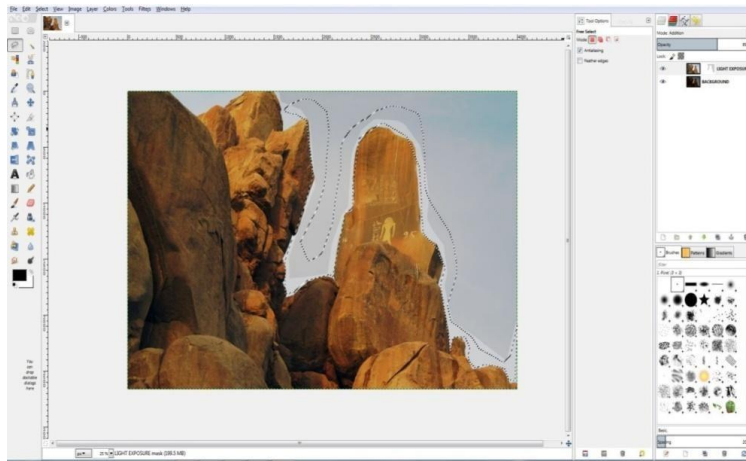
Screenshot

Now, to paint black (transparency) onto the layer mask wherever we want the lower image to show through.

To minimize painting time, use the hand-select (“lasso”) tool to select a large, hand-drawn region just inside all the borders of the area you want to paint, as shown at right. Then using the fill tool fill the selection with black.

Step 8



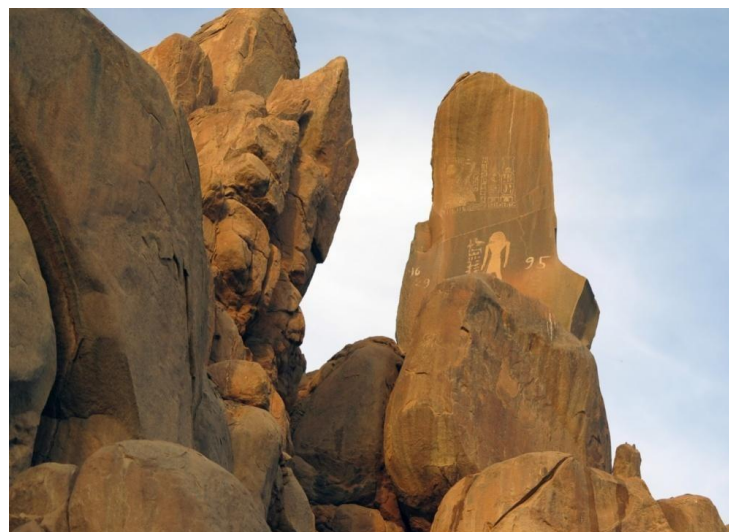
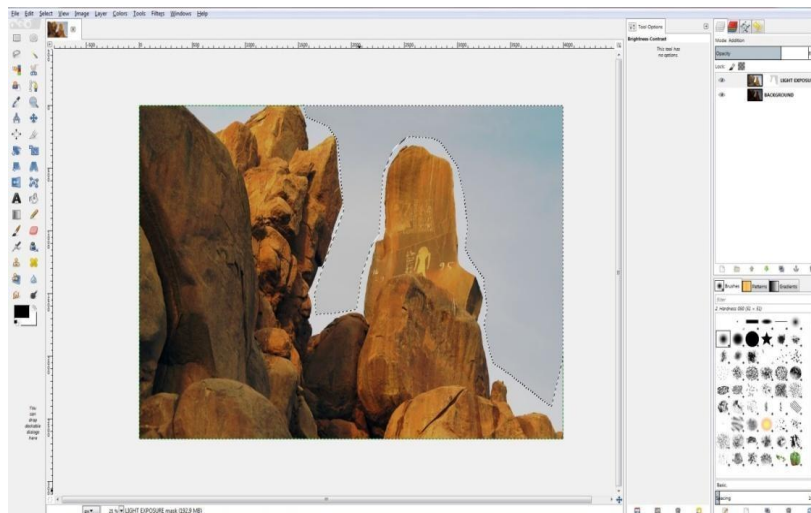
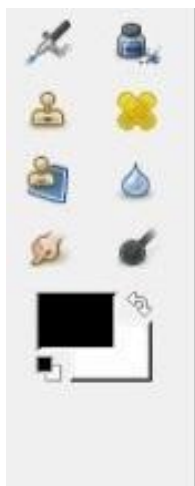


Screenshot

Next, select a large opaque brush from the Brushes dialog (Dialogs/Brushes), select the Paint tool and begin painting into the mask close to the boundaries of the blend.

Notice that we still have the opacity cranked down on the upper layer so that I can see both layers.

Step 9

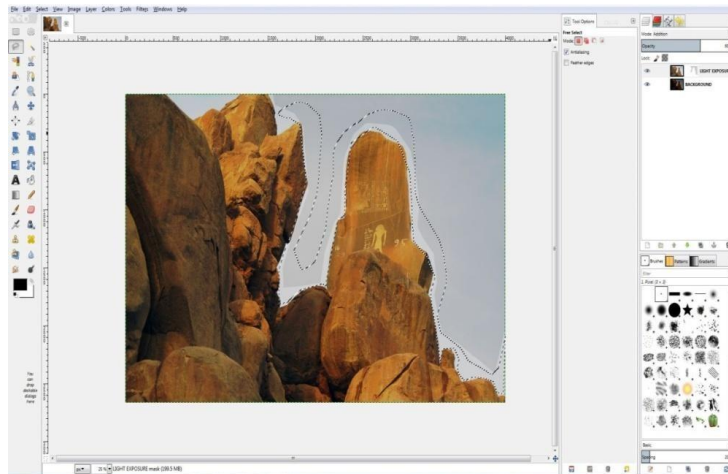


Screenshot

For the very edges, switch to a small, feathered brush and very carefully paint the edges.

While painting, zoom in and out frequently (“=” key to zoom in, “-” key to zoom out) to inspect the work. Don’t worry too much about the borders, since we’ll probably have to touch those up anyway.

Step 10



Screenshot

Now the most painstaking part: blending the seams. This is a little tricky due to the different tonalities of the two exposures.

For blending work, the Clone (), Smudge (), Airbrush () and Blur () are my tools of choice.

Since not sure if these tools have the ability to work across layers (as they do in Photoshop), duplicate the image (Ctrl+D) and flatten the duplicate (Layers -> Flatten Image) and work on it. This has the additional benefit that if ever mess up the blending job too badly can always easily start over at this step.

Note: see this tutorial on correcting blown out highlights for another example of using these tools for blending and some useful tips on their use.

Here we have used primarily clone and a touch of smudge to blend the seams of the two exposures.

Note: notice the chromatic aberration of the lens in the form of purple fringing at the edge of the arch. These tools are great for dealing with that even if I were not blending two exposures.

Final Step



Screenshot

Finished

The image still has some problems with blown out highlights in the sunlight of the rock face. It is also a little too dark in the foreground shadow.

Creating a Contrast Mask

Introduction

This tutorial will show you how to do **create a contrast mask** for your image in GIMP.



Screenshot

A contrast mask allows you to reduce overall contrast, simultaneously bringing out more detail in highlights and shadows. This may be necessary to obtain a decent print, because prints on paper do not have as much dynamic range as a monitor; if you don't control the contrast, detail in the highlights may blow out and detail in the shadows can block up and become muddy or even black. You can of course modify your image directly in GIMP to decrease contrast, but the advantage of the contrast mask technique is that it allows you much more precise control, and gives better results.

The basic technique is to create a layer above the image that contains a B&W negative of the image. The images are combined in overlay mode: dark parts with light, light parts with dark. All the while your original image remains blissfully unchanged on its layer.

Giving credit where credit is due: I did not come up with this method. I adapted it for GIMP from a Photoshop tutorial on The Luminous Landscape web site (great photography web site BTW; I recommend it).

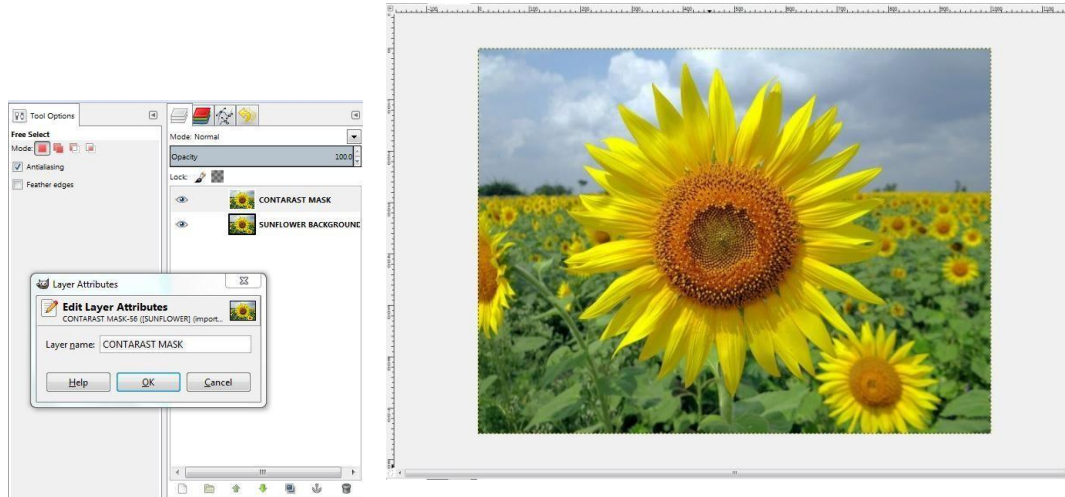
The contrast mask technique does some similar things for the exposure as the digital split ND filter and the blended exposures techniques. If you feel your image have exposure problems you might want to consider those techniques as well. Each one has different strengths. Occasionally this technique gives unacceptable color shifts in certain images. Sometimes it is just the ticket.

The Procedure

Here is the original example image, loaded into GIMP. The red leaves are a little too dark to make out the detail; if printed, the result would be pretty dark and muddy. At the same time, the yellow flowers have a couple of specular highlights that would probably blow out the detail if printed.

We want to brighten the dark areas a little and darken the light areas a little. In other words, reduce contrast.

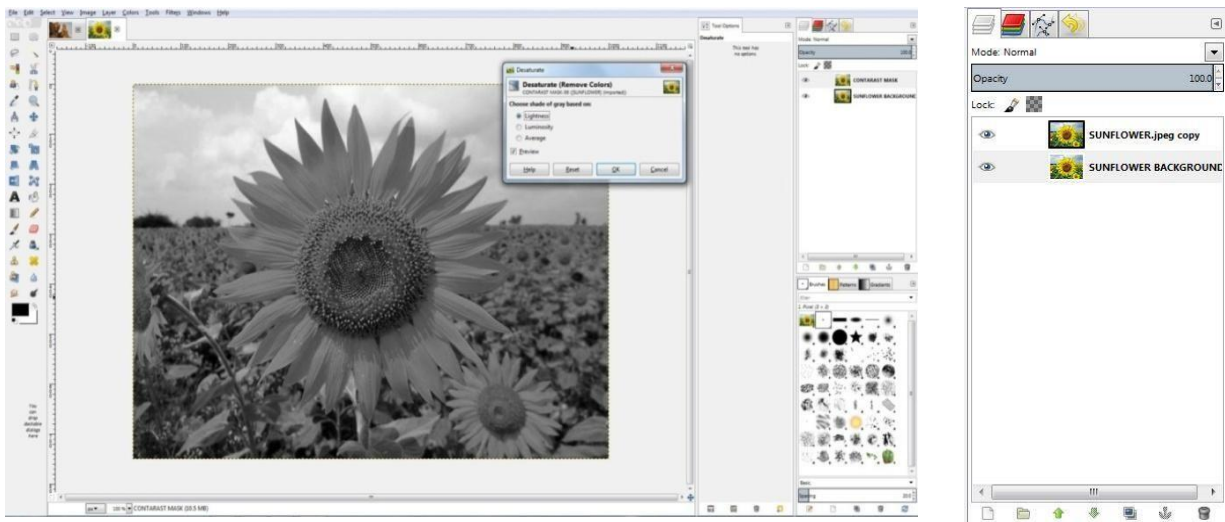
Step 1



Screenshot

Step 2

Open the Layers dialog. Right-click on the Background layer and select Duplicate (there is also a button for this in the bottom button bar of the Layers dialog).



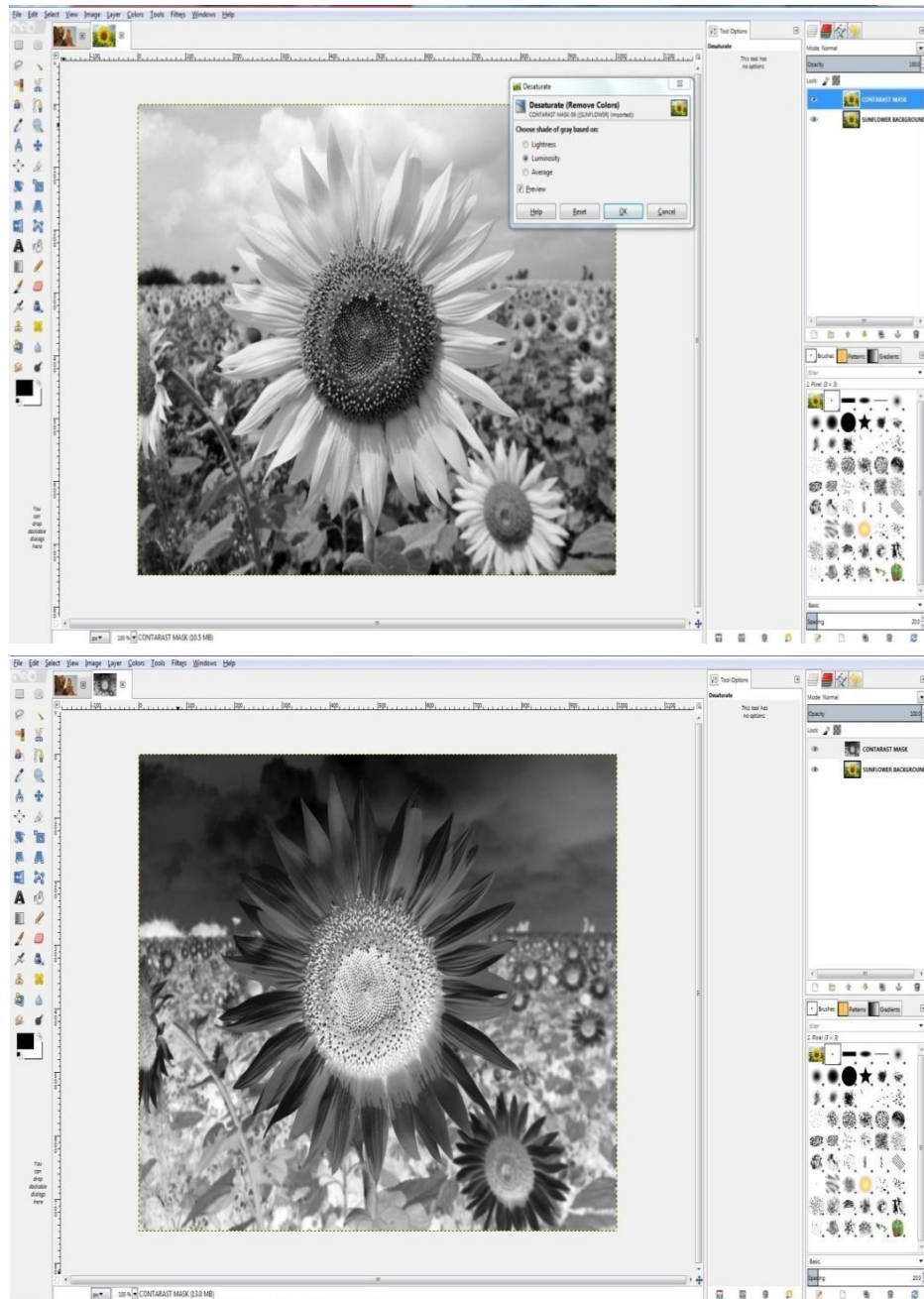
Screenshot

Now double-click on the duplicate layer and rename the new layer “Contrast Mask”. (This step is not strictly necessary, but it is helpful to prevent confusion about what is on each layer, especially if you add some additional layers for other editing purposes).

Step 3

Screenshot

Select the Contrast Mask layer. Go to the image window and right- click, selecting:
Image → Colors → Desaturate



Screenshot

Right-click and select

Image → Colors → Invert

You now have a B&W negative image of your original. We're going to combine this with the original (light with dark, dark with light) to reduce the overall contrast.

Step 5



Screenshot

Go back to the Layers dialog and in the “Mode” drop-down box, select “Overlay”. The result may look better in terms of contrast, but degraded in terms of overall sharpness. Don’t worry, we’re not done yet.

Step 6



Screenshot



Screenshot

Go back to the image window and right click, selecting Filters → Blur → Gaussian Blur

You will need to experiment to find the best value, but typically a value between 10 and 30 will do nicely. After blurring the contrast mask the overall image should now look much sharper.

Click on the “eye” next to the Contrast Mask layer in the Layers dialog to rapidly compare the image with and without the mask.

Similarly, turn off the Background layer if you want to view the mask to do further work on it.

The image at top left is the original, the top right is with the contrast mask.

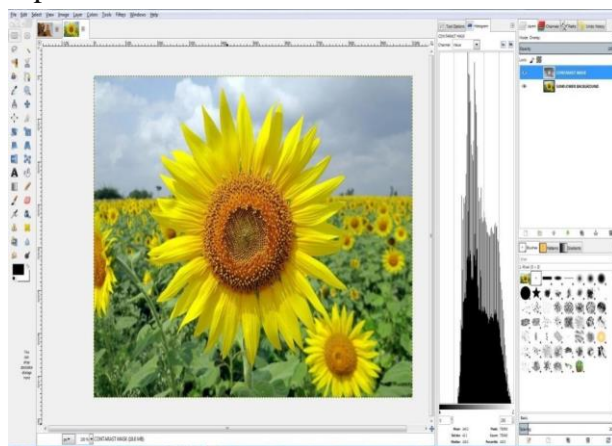
Step 7



Screenshot

It is informative to see how this technique compares to the conventional technique of using the contrast dialog to adjust contrast. I’ve tried to adjust the contrast to have the leaves appear about the same. I think the image with the contrast mask has a lot more pop! This one looks kind of flat by comparison.

Step 8



Screenshot

To see why this is so, compare the histograms of the images. The top one is for the original image, the middle is for the image with the contrast mask, and the bottom one is for the original image with the conventional contrast adjustment.

Note how the typical contrast adjustment has lost a lot of values at both ends, but the mask technique basically preserved the entire scale.

Step 9

You'll have to flatten the image if you are saving it to a typical image format like TIFF or JPEG (but not if you are saving to GIMP's native XCF format). To do that, right-click on the image and select

Layers → Flatten Image

Fine Tuning

Now that your contrast mask is created, it's time to fine tune it. Here are some things you can do:



- Use the “Opacity” slider in the Layers dialog to decrease the effect of the contrast mask overall.

- Apply Levels or Curves to the contrast mask to open up the shadows or reduce the highlights further.

- Apply the dodge and burn tools to the contrast mask.

- Apply a layer mask to the contrast mask and use it to select only parts of the contrast mask; e.g. if you only want the contrast mask to apply to certain areas of the image (see my example of this below).

Tips

- See this article for some informative tests on the effects of the Gaussian Blur step on the contrast mask.

Other Examples



Screenshot



Screenshot

With a contrast mask as described above. Notice how the sky has recovered some blue, and the detail visible under the tree!

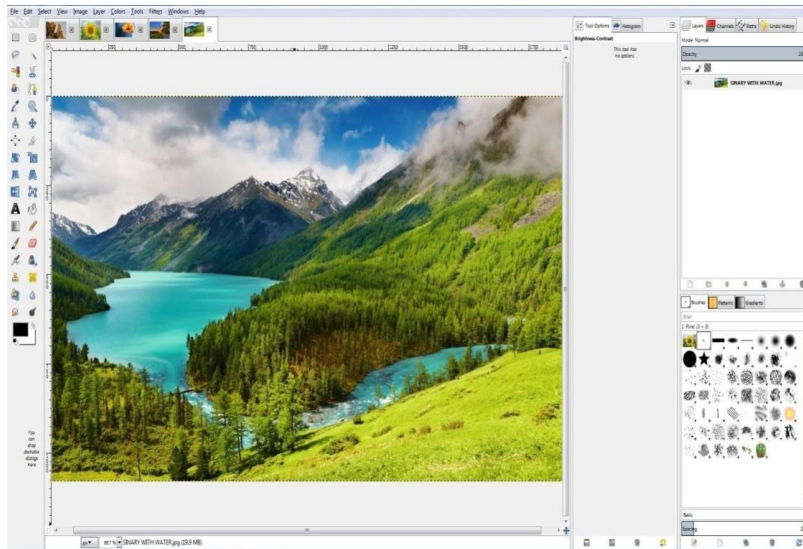


Screenshot

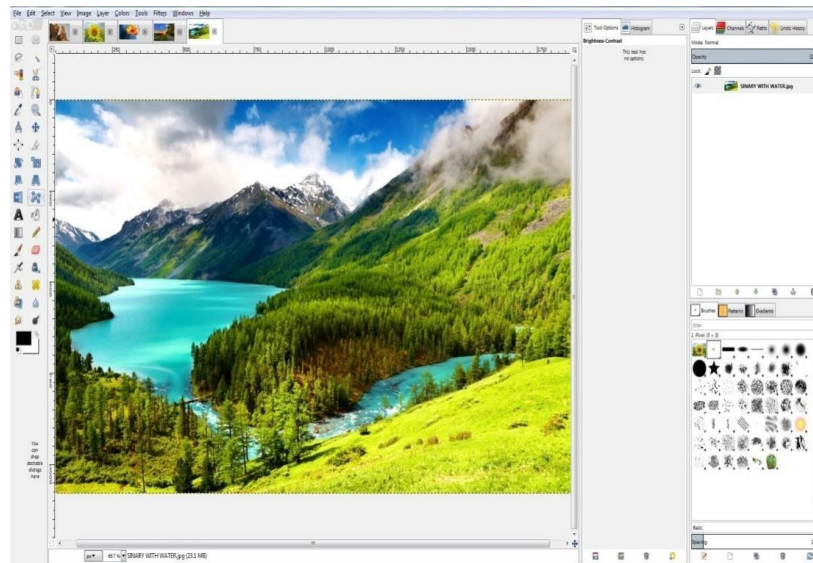


Screenshot

Here's an example of how this technique overlaps with the digital split ND filter approach. Which do you prefer?



Screenshot



Screenshot

With a digital split ND filter. (1st image)

With a contrast mask as described above, plus a layer mask with a gradient fill, so the contrast mask is mostly applied to the area below the cliffs. (2nd image)

Note particularly the change in the color of the cliffs and the light part of the sky just above the cliffs, in the image using the full contrast mask (upper right). This shows how a contrast mask affects all parts of the image, unless you selectively disable part of the mask, as I did in the lower right. Note also that with the split nd filter (lower left) I was able to brighten the foreground more; I could apply a general levels tweak to the contrast mask to achieve the same thing, but it seems like more work. This illustrates a general point for me: the digital split ND filter technique is the easier approach when you're already satisfied with half of the image, whereas the contrast mask is a better starting point if the overall image needs contrast reduction on both the dark and light sides.

Layer Masks

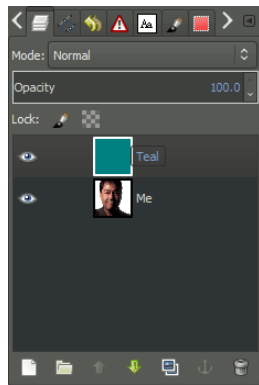
Layer masks are a fundamental tool in image manipulations. They allow you to selectively modify the opacity (transparency) of the layer they belong to. This differs from the use of the layer Opacity slider as a mask has the ability to selectively modify the opacity of different areas across a single layer.

This modification of a layer’s transparency through a mask is non- destructive to the layer itself.

This flexibility to define the opacity of different areas of a layer is the basis for more interesting image manipulation techniques such as selective coloring and luminosity masking.

Adding a Mask to a Layer

Layer masks need to be added to a layer before they can be used. The process for adding them is simple.



Title-Colorization Attribution- Pat David Source- GIMP.org

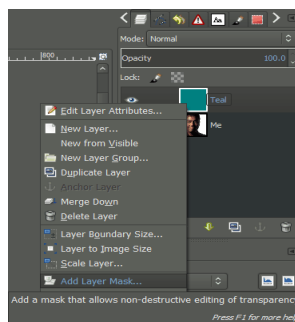
Link- https://www.gimp.org/tutorials/Layer_Masks/

Layers dialog for the image.

For this example a simple image is used with only two layers, as shown above. There is a base image at the bottom of the stack and a single layer of teal over it. The teal layer is the active layer (look for the white border), and the one which we will add a layer mask to.

Right-Click on the layer you want to add a mask to (the “Teal” layer in my example), and the Context menu will show an option to Add Layer Mask…:

Add Layer Mask in the context menu. You can also add a layer mask through the menus:

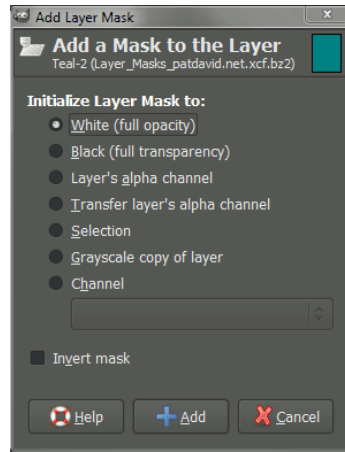


Title-Colorization Attribution- Pat David Source- GIMP.org

Link- https://www.gimp.org/tutorials/Layer_Masks/

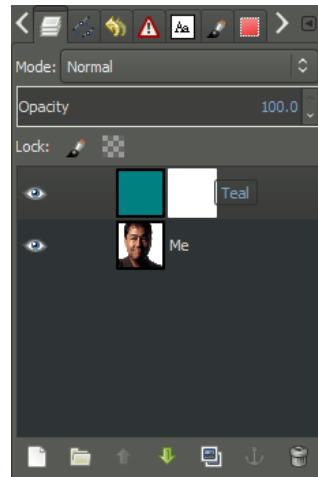
Layer → Mask → Add Layer Mask…

This will then bring up the “Add a Mask to the Layer” dialog with some options:



Screenshot

Add mask options dialog.



There are many options for initializing the Layer Mask. Notice that the first option is to set the entire mask to White, which will result in full opacity on the layer (no transparency from the mask). The option to initialize to Black shows that the mask will make the entire layer

fully transparent.

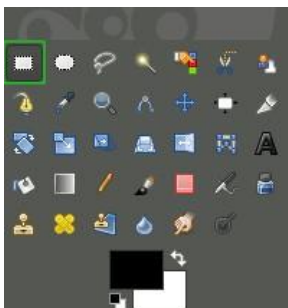
For the purposes of this tutorial, we will let the mask initialize to White (full opacity). You should notice a change in your Layers dialog now that shows the layer mask thumbnail to the right of the layer it applies to (in this case the “Teal” layer):

Layers dialog with mask applied to Teal layer.

The layer mask has now been added to the “Teal” layer. It is also active (there is a white border around the thumbnail in the dialog, but is not visible due to the mask being white as well) and ready for modification.

Modifying a Layers Transparency with the Mask At this point any operations performed on the canvas will apply to the mask and not to any layers themselves. To illustrate how masks can affect its layers transparency, let’s paint!

Use the Rectangle Select tool to select roughly the top third of the image, and I’ll fill this selection with black.



Tools → Selection Tools → Rectangle Select

Activating the **Rectangle Select** tool.

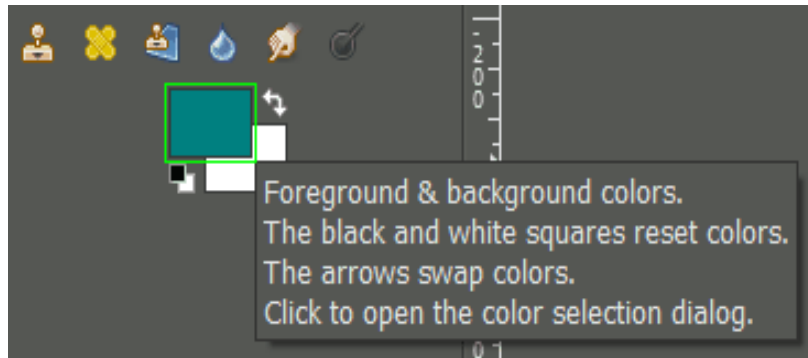
Using the Rectangle Select tool, select roughly the top third of the

image:

Top third of the image selected.

If you want to fill this selection with black, but before you do you need to make sure that the foreground color is black. Click on the foreground color in the Color area to bring up the “Change Foreground Color” dialog:

Click the foreground color to change.



The “Change Foreground Color” dialog allows you to set the foreground color. For this example set the color to black, RGB(0, 0, 0):

Change the color to black.

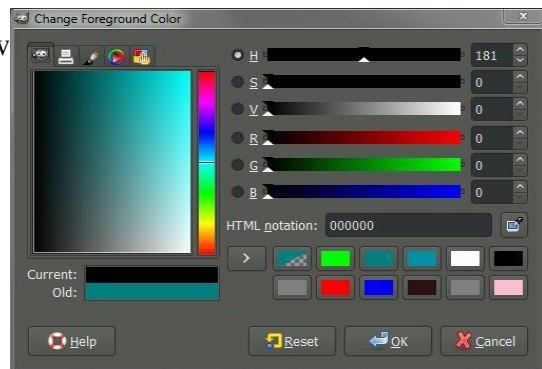
With the foreground color set, you can now use the Bucket Fill Tool to fill in the selection.

Tools → Paint Tools → Bucket Fill

Title-Colorization **Attribution-** Pat

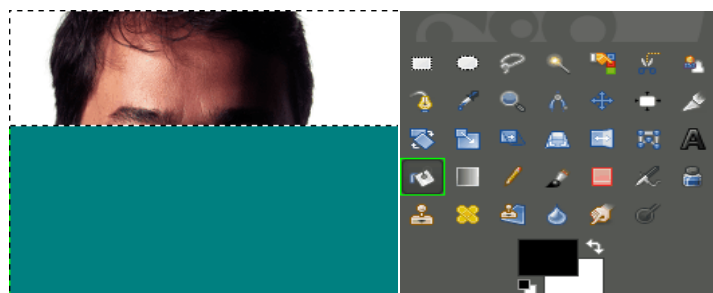
David Source- GIMP.org

Link- https://www.gimp.org/tutorials/Layer_Masks/



Activating the **Bucket Fill** tool.

You can now click inside the selection to fill it with the foreground color (black). As soon as you do, you’ll be presented with a new view of your image on the canvas:



Title-Colorization **Attribution-** Pat

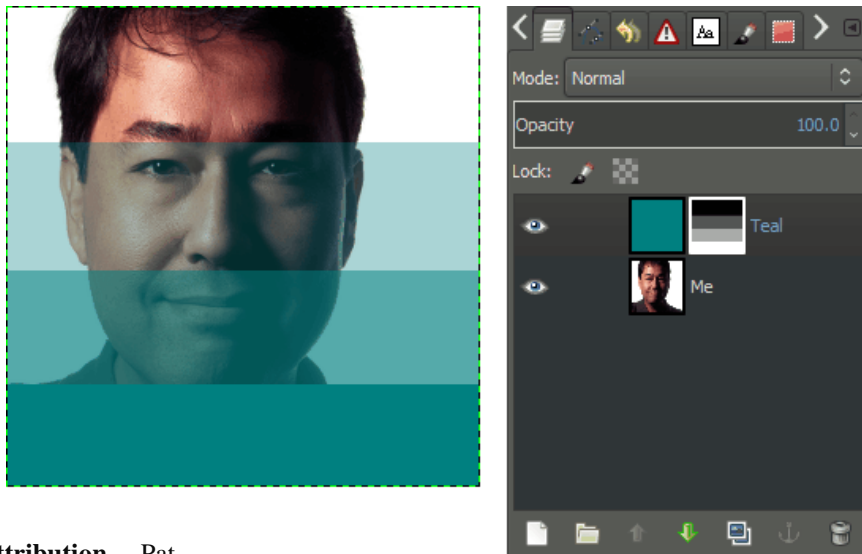
David Source- GIMP.org

Link- https://www.gimp.org/tutorials/Layer_Masks/

As you can see, filling the selected portion of the layer mask with black resulted in that

area having 100% transparency, showing the layer below it.

If you Rectangle select a different area of the mask, you can fill it in with a different shade of gray to produce a variable opacity. For example, I will select a few different regions of the mask, and fill it with different levels of gray:



Title-Colorization Attribution- Pat

Source- GIMP.org

Link- https://www.gimp.org/tutorials/Layer_Masks/

If you examine the layer mask, you'll see that there are different levels of gray being applied (black to white, from top to bottom), and their value is what determines the opacity of the layer.

Selective Colorization Example

A good example of the application of layer masks is doing selective colorization of an image (selectively allowing color to show through a mostly black and white image). Walk through how to easily do this with an image from Mardi Gras 2013:



Title-Colorization

Attribution- Pat David

Source- GIMP.org

Link- https://www.gimp.org/tutorials/Layer_Masks/

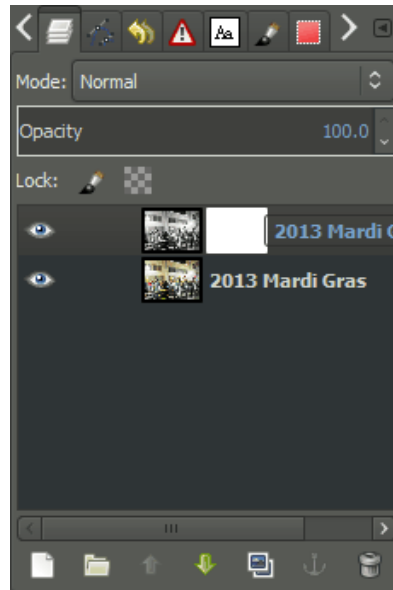
Start the process by duplicating the base image (Shift+Ctrl+D, or Right-Click layer → Duplicate Layer). From the menu:

Layer → Duplicate Layer

Then desaturate the upper layer using:

Colors → Desaturate

Following the steps above, add a layer mask to the desaturated layer and initialize it to White (full opacity). At this point, the Layers dialog should look like this:



Screenshot

As before, set your foreground color to black. This time, rather than filling selections, we are going to use the Paintbrush Tool to paint areas of the image we want the color to show through from the layer below.

I decided to paint the boy on the fence. Using the Paintbrush Tool I painted over his shirt and head. This allowed those colors to show through from the layer below. Here are the results after painting:



Title-Colorization **Attribution-** Pat

Source- GIMP.org

Link- https://www.gimp.org/tutorials/Layer_Masks/

Simple Selective Colorization Example To illustrate what was done, here is the layer mask I painted to achieve the above result: Mask isolated to



illustrate Of course, you could have chosen a different color than black to create the mask. If you wanted a slightly more muted color I could have painted with a more middle gray vs. black:



Simple Selective Colorization
Example (painted with gray vs. black).

Basic Color Curves

Color has this amazing ability to evoke emotional responses from us. From the warm glow of a sunny summer afternoon to a cool refreshing early evening in fall, we associate colors with certain moods, places, feelings, and memories (consciously or not).

Instead, we are going to take a look at the use of the Curves tool in GIMP. Even though GIMP is used to demonstrate these ideas, the principles are generic to just about any RGB curve adjustments.

You're Pixels and You

First there's something you need to consider if you haven't before, and that's what goes into representing a colored pixel on your screen.



Title-Basic Color Curves **Attribution-**

Pat David **Source-** GIMP.org

Link- https://www.gimp.org/tutorials/Basic_Color_Curves/

Open up an image in GIMP.Now zoom in.

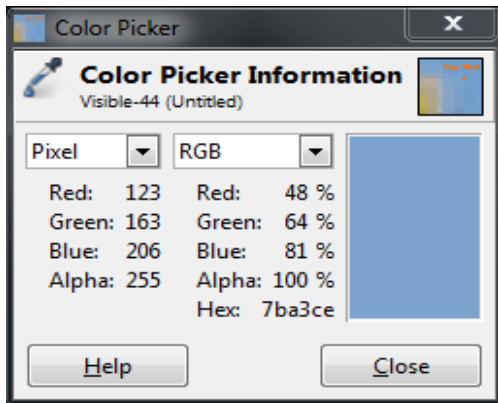
Nope - don't be shy now, zoom in more! And there's Nope - don't be shy now, zoom in more! And there's your pixel. So let's investigate what goes into making your pixel.

Remember, each pixel is represented by a combination of 3 colors: Red, Green, and Blue. In GIMP (currently at 8-bit), that means that each RGB color can have a value from 0 - 255, and combining these three colors with varying levels in each channel will result in all the colors you can see in your image.

If all three channels have a value of 255 - then the resulting color will be pure white. If all three channels have a value of 0 - then the resulting color will be pure black.

If all three channels have the same value, then you will get a shade of gray (128,128,128 would be a middle graycolor for instance).

So now let's see what goes into making up your pixel: The RGB components that mix into your final blue pixel.



As you can see, there is more blue than anything else (it is a bluish pixel after all), followed by green, then a dash of red. If we were to change the values of each channel, but kept ratio the same between Red, Green, and Blue, then we would keep the same color and just lighten or darken the pixel by some amount.

Curves: Value

So let's leave your pixel alone for the time being, and actually have a look at the Curves dialog. I'll be using this wonderful image by Eric from Flickr.

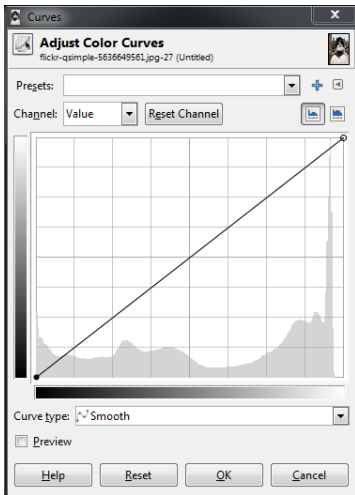


Title-Curves Value Attribution-

Qsimple **Source-** flickr.com

Link- https://www.gimp.org/tutorials/Basic_Color_Curves/

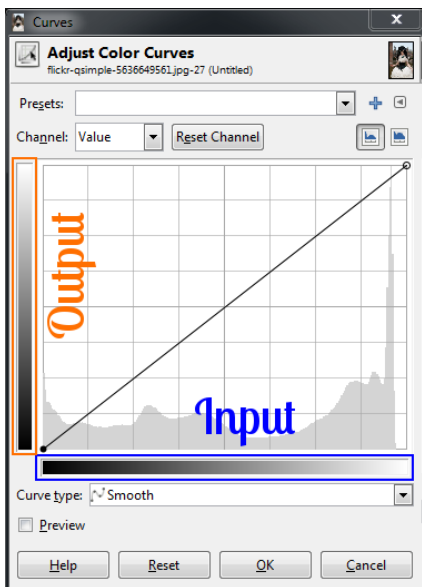
Opening up my Curves dialog shows me the following: Colors → Curves...



We can see that I start off with the curve for the Value of the pixels. I could also use the drop down for “Channel” to change to red, green or blue curves if I wanted to. For now let’s look at Value, though.

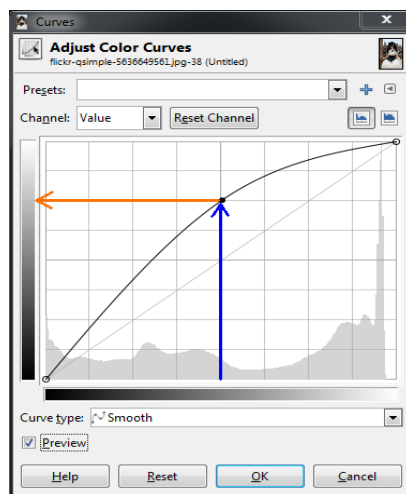
In the main area of the dialog I am presented with a linear curve, behind which I will see a histogram of the value data for the entire image (showing the amount of each value across my image). Notice a spike in the high values on the right, and a small gap at the brightest values.

What we can do right now is to adjust the values of each pixel in the image using this curve. The best way to visualize it is to remember that the bottom range from black to white represents the current value of the pixels, and the left range is the value to be mapped to.



So to show an example of how this curve will affect your image, suppose I wanted to remap all the values in the image that were in the midtones, and to make them all lighter. I can do this by clicking on the curve near the midtones, and dragging the curve higher in the Y direction:

Screenshot



Screenshot

What this curve does is takes the values around the midtones, and pushes their values to be much lighter than they were. In this case, values around 128 were re-mapped to now be closer to 192.

Because the curve is set Smooth, there will be a gradual transition for all the tones surrounding my point to be pulled in the same direction (this makes for a smoother fall-off as opposed to an abrupt change at one value). Because there is only a single point in the curve right now, this means that all values will be pulled higher.

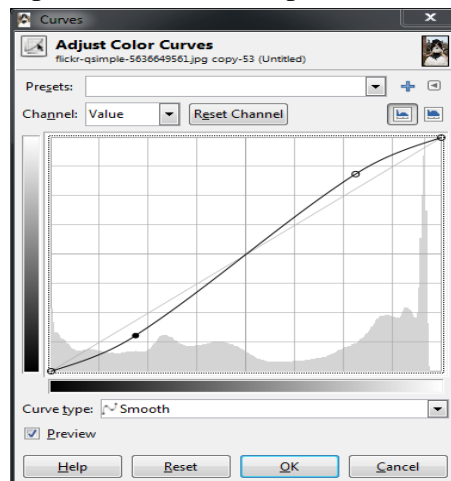


Screenshot

The results of pushing the midtones of the value curve higher (compare to original).

Care should be taken when fiddling with these curves to not blow things out or destroy detail, of course. We only push the curves here to illustrate what they do.

A very common curve adjustment you may hear about is to apply a slight “S” curve to your values. The effect of this curve would be to darken the dark tones, and to lighten the light tones - in effect increasing global contrast on your image. For instance, if I click on another point in the curves, and adjust the points to form a shape like so:



Screenshot

A slight “S” curve

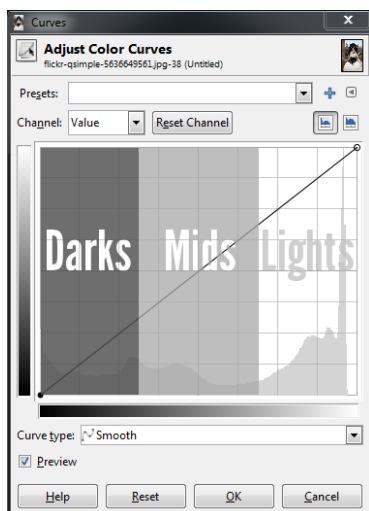
This will now cause dark values to become even darker, while the light values get a small boost. The curve still passes through the midpoint, so middle tones will stay closer to what they were.



Screenshot

Slight “S” curve increases global contrast (click for original).

In general, it easiest to visualize in terms of which regions in the curve will affect different tones in your image. Here is a quick way to visualize it (that is true for value as well as RGB curves):



If there is one thing you take away from reading this, let it be the image above.

Curves: Colors So how does this apply to other channels? Let’s have a look.

The exact same theory applies in the RGB channels as it did with values. The relative positions of the darks, midtones, and lights are still the same in the curve dialog. The primary difference now is that you can control the contribution of color in specific tonal regions of your image.

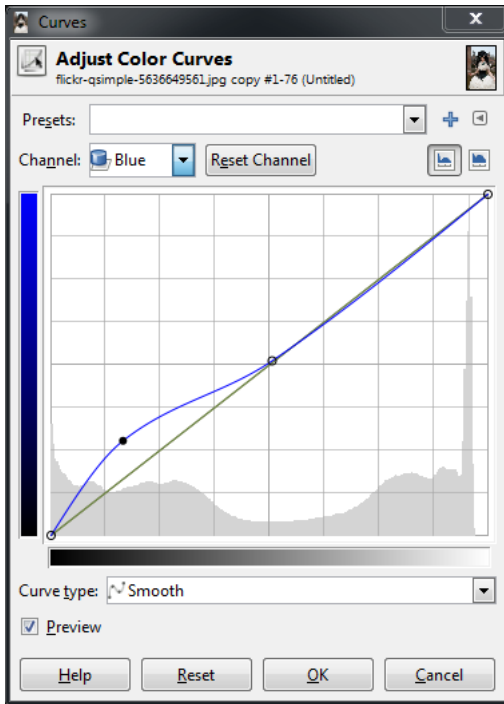
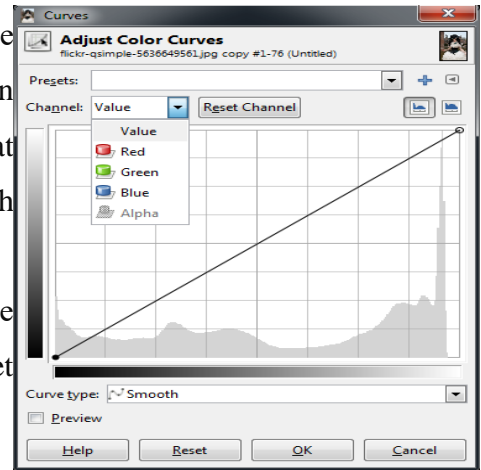
Value, Red, Green, Blue channel picker.

You choose which channel you want to adjust from the “Channel” drop-down.

To begin demonstrating what happens here it helps to have an idea of generally what effect you would like to apply to your image. This is often the hardest part of adjusting the color tones if you don’t have a clear idea to start with.

For example, perhaps we wanted to “cool” down the shadows of our image. “Cool” shadows are commonly seen during the day in shadows out of direct sunlight. The light that does fall in shadows is mostly reflected light from a bluish sky, so the shadows will trend slightly more blue.

To try this, let’s adjust the Blue channel to be a little more prominent in the darker tones of our image, but to get back to normal around the midtones and lighter.



Screenshot

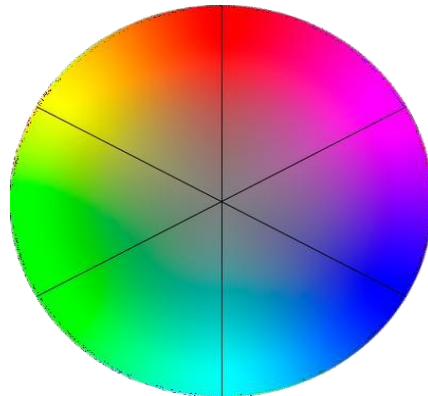
Boosting blues in darker tones



Screenshot

Now, here's a question: If you wanted to "cool" the darker tones with more blue, what if you wanted to "warm" the lighter tones by adding a little yellow?

Well, there's no "Yellow" curve to modify, so how to approach that? Have a look at this HSV color wheel below:



Screenshot

The thing to look out for here is that opposite your blue tones on this wheel, you'll find yellow. In fact, for each of the Red, Green, and Blue channels, the opposite colors on the color wheel will show you what an absence of that color will do to your image. So remember:

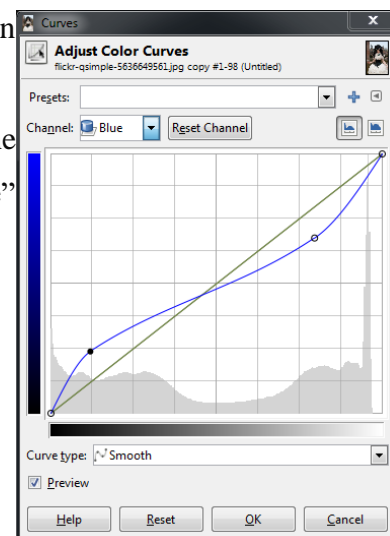
Red → Cyan

Green → Magenta

Blue → Yellow

What this means to you while manipulating curves is that if you drag a curve for blue up, you will boost the blue in that region of your image. If instead you drag the curve for blue down, you will be removing blues (or boosting the Yellows in that region of your image).

So to boost the blues in the dark tones, but increase the yellow in the lighter tones, you could create a sort of "reverse" S-curve in the blue channel:



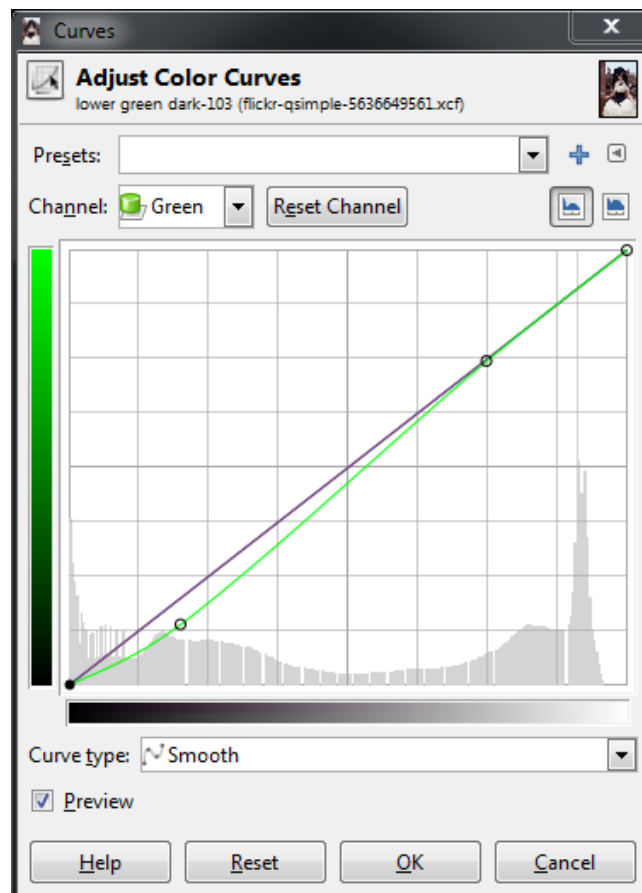
Screenshot



Screenshot

Boost blues in darks, boost yellow in high tones

In the green channel for instance, you can begin to introduce more magenta into the tones by decreasing the curve. So dropping the green curve in the dark tones, and letting it settle back to normal towards the high tones will produce results like this:



Screenshot



Screenshot

Suppressing the green channel in darks/mids adds a bit of magenta
(click for original).

In isolation, these curves are fun to play with, but think that perhaps walking through some actual examples of color toning/grading would help to illustrate what we are talking about here. Choose a couple of common toning examples to show what happens when you begin mixing all three channels up.

Unit Summary

This unit introduced the Gimp and its various applications. We learnt the use of GIMP tool to edit images professionally. It discussed in details about GIMP Express which is used for minor editing and GIMP Editor which is used as a professional image editing tool. It elaborated the use of GIMP to edit image using its various tools like Editing Masking, Colour adjustments, layer masking, etc through tutorials.

Assessment

1. What is GIMP?
2. What are Layers?
3. What are the features & capabilities of GIMP?
4. What are the three different types of color channel?
5. What is Layer masks In GIMP? Give example.
6. What is the use of Bucket Fill Tool?
7. Select a photograph and adjust the colour toning & gradient of that photograph using

GIMP.

Resources

1. <https://docs.gimp.org/odftest/en.pdf>
2. www.gimp.org
3. <http://wwwcdf.pd.infn.it/localdoc/gum.pdf>
4. All images saved from screenshot which are done manually using the above editors.
5. Some materials referenced from Google. This website states, it is not copyrighted, thus a free material.

Unit 4 Techniques behind VFX

Introduction

involve the integration of live-action footage and Visual effects are processes by which imagery is created or manipulated outside the context of a live action shot. Visual effects involve the integration of live-action footage and generated imagery to create environments which look realistic, but would be dangerous, expensive, impractical, or impossible to capture on film. Visual effects using computer-generated imagery have recently become accessible to the independent filmmaker with the introduction of affordable and easy-to-use animation and compositing software. Visual effects are processes used to manipulate imagery world which is manipulated in postproduction house. Visual effects have taken over the kinds of imagery effect or processes which were once dominated called *spcialeffects*. Special effects are effects either created on the camera or by CGI. Both of these processes are employed to take advantage of technology to make imagery that is impossible to find in the real world or far too difficult or may be dangerous. Some shots may be expensive to achieve without the use of visual or special effects

Outcomes

Upon completion of this unit you will be able to:

- Understand the techniques of VFX
- Understand what is digital compositing
- Learn about Computer generated Imagery CGI
- Learn importance of visual effects shots

Terminology

VFX: Visual effects are processes by which imagery is created or manipulated outside the context of a live action shot.

Digital compositing: Digital compositing is the process of digitally assembling multiple images to make a final image, typically for print, motion pictures or screen display. It is the digital analogue of optical film compositing.

CGI: It is the computer generated imaginary.

Chroma: Chroma key compositing or chroma keying, is a visual effects / post-production technique for compositing (layering) two images or video streams together based on color hues (chroma range).

Keying: The portions of the video which match the preselected color are replaced by the alternate background video. This process is commonly known as "**keying**", "**keying out**" or simply a "**key**".

Visual Effects

there were two major special effects categories, in the year 1990 called as *Opticaleffects* or techniques such as multiple exposures, glass shots, or mattes. Also in this category the effects were also achieved through the optical printer, where footage could be photographed. Even today the optical printing effects are the basis for the software-based effects. The second category is *mechanicaleffects*, which are effects created on set, in front of the camera, such as with models, props, and make-up.

In the late 1980s, digital compositing developed. Compositing is the demonstration of consolidating two diverse symbolism sources; a procedure that was once done on an optical printer is currently upgraded with the more noteworthy control permitted by PCs, at a significantly decreased cost. The mid 1990s saw the start of wide utilization of what is regularly alluded to as CGI or CG. CGI or PC produced symbolism consolidates the procedure of activity with the utilization of photorealistic surfaces to make characters, view, and whatever else the psyche can envision to make what can't be shot.

In the present visual impacts world, two noteworthy arrangements of systems are utilized to unravel generally issues. Will the shot an executive needs be accomplished by producing designs, joining distinctive wellsprings of film, or utilizing the two procedures?

Digital Compositing

The utilization of advanced compositing has turned out to be so ordinary in present day diversion that it will frequently go totally under the watcher's radar. A case of ordinary compositing is your TV meteorologist. Your meteorologist is remaining before a green screen (or blue screen), which is expelled and supplanted with PC created maps.

Green screens and blue screens are utilized as a part of a procedure called chroma keying or shading keying. The utilization of entering started in the 1930s when a meticulous concoction process, beside a troublesome match up shooting process, was utilized at an awesome cost of time and cash. Be that as it may, with the utilization of video and advanced compositing, the procedure has turned out to be speedy and cheap.

Basically, an on-screen character, or subject, is shot before a screen that is either blue or green. The shading does not need to be blue or green, but rather blue and green are utilized frequently on the grounds that they are in the scope of hues most inverse to human skin. Blue, the inverse of yellow, was the customary decision, which changed over to green when advanced compositing turned into the standard on the grounds that computerized cameras react better to the higher luminance estimations of green. At the point when a film or non-computerized camcorder is being used, blue is regularly favored. Green is regularly utilized when a shoot

happens outside due to the sky.

The shading screen background would then be able to be evacuated. At the point when film is shot digitally, data is put away in discrete shading channels. These will be red, green, and blue. Moreover, there is a fourth channel, the alpha channel. The alpha channel controls the clarity of the shading channels, and in a composite shot the compositor can determine the shading range that will get either a decreased straightforwardness or evacuation. At that point a different bit of film can be put behind the shading keyed shot and the joined shot is done.

Keying isn't the main technique for utilizing the utilization of alpha channels. The utilization of garbage mattes is frequently important to help where shading keys are excessively troublesome. Garbage mattes more often than not allude to the procedure of hand drawing the zone that will have a decreased transparency. The modifier "garbage" alludes to the way that it is typically brief or utilized as a feature of another procedure.

At the point when this isn't utilized as an impermanent or assisted measure, the compositor is said to masking. The motivation behind why this procedure isn't utilized more frequently than shading (colour) keying is because of the way that it more often than not requires alteration frame by frame. Considering film (footage) with a hand-drawn process frame by frame is referred as rotoscoping. Rotoscoping is the way toward reshaping a matte, however it can likewise be utilized to portray a shot that incorporates a hand-drawn or balanced system that requires consideration for every individual edge. In this way, some speedy math, a motion picture has 24 frames for each second (fps) while a TV show or business has around 30 fps. Indeed, on a 30-second commercial that would be 900 different images that a roto-scoper must take care of, which isn't generally alluring in the snappy pivot entertainment surrounding we live in. The digital or computerized compositing world comes furnished with little partners to lessen the requirement for rotoscoping. Motion tracking is one of the example within this. A territory of a picture can be recorded or tracked by the PC with the goal that some different procedure can be utilized to that region. For instance, in the Digital Dismemberment, we can paint out and supplant half of a performing artist's arm. To abstain from rotoscoping, we can put a dark spot with a marker on our on-screen character's arm so that the PC can track and afterward something could be joined to that point in its place.

Computer-Generated Imagery

Frequently joined with compositing, the other classification of strategies used to take care of most visual impacts issues is the production of CGI or CG. What this will involve is either assembling a few 2D or 3D dimensional digital (computerized) models that, dissimilar to live performers or actual real locations or scenes can be changed and moved effectively around to accomplish the coveted scene.

While the utilization of CGI scenes started in the late 1970s, what denoted the entry of what has turned out to be exceptionally regular in the present visual impacts is the 1993 super hit film Jurassic Park where CGI dinosaurs were convincingly incorporated into scenes with live performing artists. Presently, that isn't the special case, it's the standard.

Frequently, not simply Pixar characters but rather even sets, helicopters, structures like buildings, and blasts are ordinarily made using PC produced graphics that are composited into scenes. This unit will talk about the procedures for making 2D and 3D designs in After Effects and also Apple's Motion and Autodesk's Combustion, however these projects can just begin to expose what's underneath of the 3D illustrations world, as there are many devoted projects to create and animating 3D characters and universes.

Three-dimensional character movement has to a great extent supplanted the conventional hand-drawn animated characters. In dream type films, for example, the current Star Wars prequel set of three, 300, Sin City, and the Lord of the Rings set of three, performing artists were for the most part shot in blue or green rooms to have 2D-and 3D-rendered sets supplanting the screen foundations. The simplicity of control and the scope of conceivable outcomes have made 3D-rendered sets a perfect decision over the antiquated arrangement of utilizing scale models. Notwithstanding when scale models are picked by the generation groups, 3D graphics are utilized to improve the models.

Particle systems are utilized to reproduce regular marvels, for example, smoke, fire, rain, snow, and tidy. Basically, similar to a streaming wellspring of pixels, these particles can be controlled to react to true material science at the tact of the VFX craftsman.

The under realized Power of Available Software

A standout amongst the most generally utilized instruments by VFX craftsmen is something you likely have on your PC as of now, Adobe Photoshop. Initially composed by Thomas Knoll while he was a doctoral scholar, the thought got the consideration of his sibling John Knoll, he has worked in Industrial Light and Magic. John Knoll has turned into a academy award winner and foundation grant champ for his VFX job away at the current Pirates of the Caribbean films and is perceived for his work on numerous different movies that depend on VFX.

Be that as it may, notwithstanding Photoshop's heredity as having an association with the universe of visual impacts, it has viable use as an instrument for VFX specialists. Thought to be the establishment programming for altering any picture on a PC, it's frequently utilized as a part of conjunction with Adobe After Effects. Eventual outcomes reads the different layers of a Photoshop archive and enables the client to apply keyframe style animation of liveliness to them. For painting style impacts, clients will alter pictures from After Effects in Photoshop to have an advantage of Photoshop's unequaled quality with painting instruments and after that

arrival the picture to After Effects. The first vision of programming creators of After Effects was to take what Photoshop does and put it on a course of events.

Beside Adobe, Apple has filled their PCs with an awesome number of stunning, proficient programming packages. Apple's Final Cut Pro Studio began as an elective editing framework that overwhelmed the postproduction world. Numerous VFX shots that once would have required an excursion apart from an editing package can be executed in Final Cut Pro, which utilizes a comparable key framing engine to After Effects. Sparing time and cash numerous VFX issues would now be able to be settled in a similar program that the editing may happen in.

Apple presented Motion in 2004, which later turned out to be a piece of the Final Cut Studio. Created at first to encourage ease the need to leave the Final Cut condition, Motion has developed into a proficient contender to After Effects. It has a few impediments, so it's not exactly a genuine trade for AE till now; be that as it may, it has the solid preferred standpoint of tight combination with Final Cut. These projects are ordinary among an assortment of clients, however frequently their actual potential goes unnoticed in light of the fact that the client doesn't know the procedures to take genuine preferred advantage and support of these projects.

Preparing for your visual effects shot

Here we will examine tips and strategies for setting up a VFX shot. The measure of time spent in preproduction can spare significant hours on the creation and days in postproduction.

An awesome case is like this something. Suppose you're taking a shot at a shoot that requires a bright day, however in preproduction the climate reports were not checked and it's cloudy. So they waited over the set, for the mists to spread, however the mists don't, so they shoot at any cost. Presently regardless of numerous endeavours to cut around the cloudy film, the editor needs the shot. A compositor is brought in to supplant the mists and light up the recording to influence it to look right. Contingent upon the shot, it may take lot of times altogether however in the event that there's loads of movement, it may take much more time. Presently, had the climate been checked, the issue could have been worked around.

Presently every issue can't be expected, and plans must be worked out. In any case, what ought to be maintained a strategic distance from are things that can be dealt with effortlessly on the preproduction and production levels. You must have heard the joke "we'll settle it in post?" Well, it's not a joke for all, and keeping in mind that numerous issues can be settled in postproduction, for what reason do that when it can be settled by simply changing the framing or, even better, simply going into production with a superior thoroughly considered arrangement.

Tips for VFX Artists in Preproduction

Let's see a couple of tips on the best way to help your VFX shot keep running as easily as could be expected.

Storyboard the Effect

Film scholars with storyboards don't go together and they are like oil-and-water association. It's terrible on the grounds that arranging is entirely critical, and in the event that you can envision it, early issues can be expected. We will see exhibit utilizing Photoshop to make storyboards. There are some particular favourable circumstances to storyboarding an impact carefully; utilizing Photoshop you can think of something considerably nearer to the last shot than stick figures.

Get Your Camera and Do a Test Shoot

It's really amazing that how could some postproduction people don't go from their workplace. On the off chance that you realize that you have an impact shot coming up, for what reason not give it a shot? Get the camera and make a test shot. You ought to have some thought of what you would get and provide yourself the chance to expect issues. It's imperative that the shot be hand-held or bolted off? Is lighting may be an issue? Will you require track focuses? The test film(footage) can be conveyed to VFX specialists, can be tested, tried and utilized for something.

Show up on Set

A few directors, if the shot will depend on an impact, will demand a VFX individual being available amid the shoot. Enormous spending Hollywood motion pictures do this, and there's no purpose behind an independent to be any extraordinary. Particularly if the VFX craftsman has done tests as of now, now he/she can exhort or advise on how everything is being finished. Knowing where the issues will shoot, you can yell to the director that maybe a retake is all together, given obviously that the entire team of production compliant to it as instances are there some may or may not comply.

Research the Technique

At the point when given a visual impacts venture you ought to have some thought regarding how to work on it. In spite of the fact that, why stick to one process up to your basic knowledge, when you have a universe of information readily available?

Browse the Google and complete a little snappy research. How do individuals take care of this issue? On the off chance that you take after a long-established system for making a specific impact or effect, has the procedure changed?

Generally, character animation in After Effects was finished by bringing the character into Photoshop, cutting every one of the parts up into layers, and afterward bringing in each one of those layers into After Effects, changing all the Anchor Points, and utilizing a complex Parenting plan. Seem like a considerable measure of work? It may be.

At the point when After Effects CS3 turned out, it appeared like a minor update, off-base! One new impact has totally changed the procedure of character animation, the Puppet Tool. Presently you can have full control over a character on a solitary layer. Beside the likelihood that you might not have the best procedure for making an impact, the best methods frequently change.

Text effects

In 1994 when **Seven** was released, people were not just blown away by the film itself, but also by the excellent **titlesequence** designed by Kyle Cooper. Title sequences got a huge boost from the enthusiasm for the one seen in Seven. It created a sense of anticipation for the film that would follow; just by the title sequence the audience became unnerved — like, okay what you are about to see is like nothing you've seen before. In this section you will see some tutorials on how you can give your film that exciting boost that only the right title sequence can give.

Title Sequence Workflow



(Created by Author)

Even the most utilitarian, functional purpose-only title sequence can have a little style and flair and bring up the level of your production. However, there are ways of overcomplicating a title sequence without some careful considerations for the workflow.

Ingredients:-

- The background images for the title sequence.
- Text file with credits listed (in most situations, producers will give the designer a text file with the credits listed).

Text Background Integration





(Created by Author)

This technique has also been used on Heroes, but we've seen it a lot in TV commercials. Basically we take generated text layers and make them a part of the scene by taking advantage of 3D space. Typically, actors will walk in front, or on top of our type to make it feel more three-dimensional.

Ingredients:-

- Footage of actors walking in a fairly large space

Three-Dimensional Text

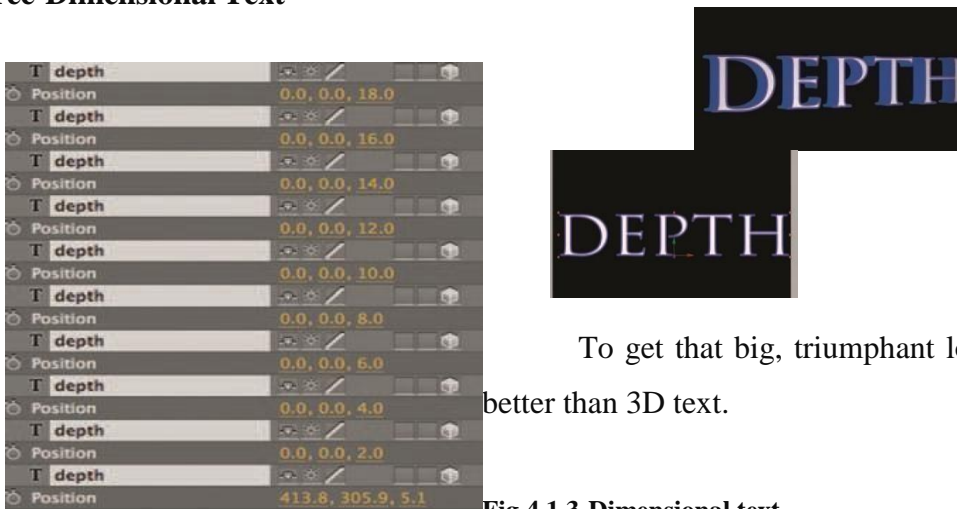


Fig 4.1 3-Dimensional text

To get that big, triumphant look, nothing does better than 3D text.

The new glass shot

A glass shot is a strategy that is to a great degree low tech yet exceptionally viable. Basically, when a movie maker wants to include landscape components and its cost is too high to create set pieces, movie producers would paint the required additional view on a sheet of glass and shoot the performing artists with the glass specifically before the camera. Sounds enchanting and curious, isn't that so? Surprisingly, This procedure was very basic at present. In any case, now, on account of computerized digital compositing programming, shots that used to utilize these glass strategies can be balanced carefully with more accuracy and more prominent capacity.

The visual impacts methods talked about here are not intended to hit the watchers beyond understanding; apart these systems not upset the scene. In the wake of taking in these strategies, it's really amazing that how frequently these are utilized and regularly goes unnoticed. On the off chance that the impact is perfectly done, the viewers never loses that suspension of doubt, and these are presumably a portion of the most straightforward to pull off without demonstrating the hand of the VFX artists excessively.

Modifying a Building



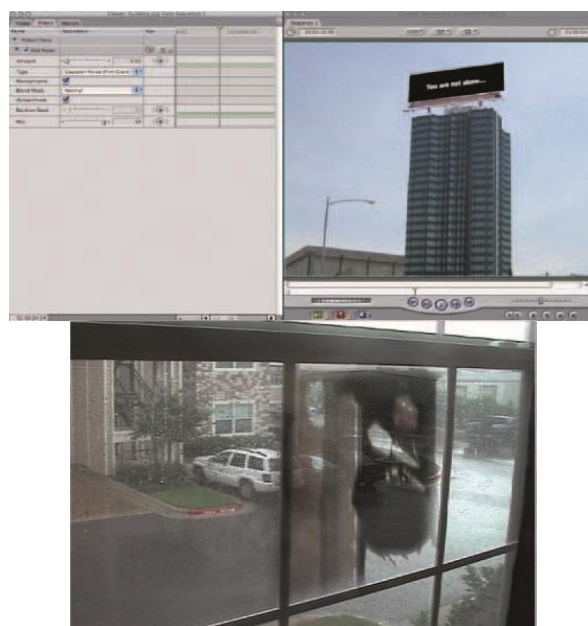
Fig 4.2 Modifying building(Created by Author)

Amid creation on a movie, movie makers are regularly in the circumstance of requiring an outside shot that is not existing. Suppose we need to make a world with large messages to our hero so how about we add a bulletin or hoarding to the highest point of a working in Photoshop.

Requirements:-

- A master shot of the building that ought to be adjusted.
- Another shot with the components to be added to the building.

Adding Reflections to a Shot

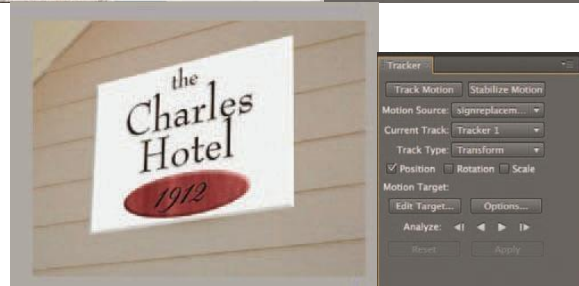
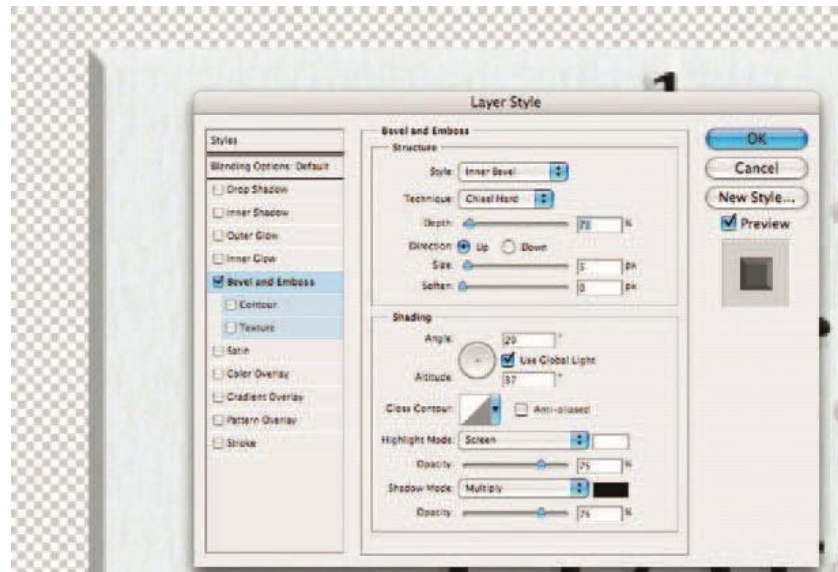


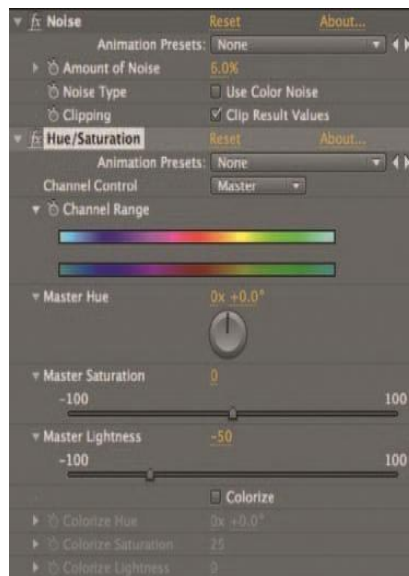
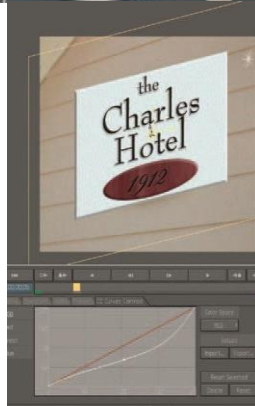
Regularly hard to shoot, shots containing a reflection can include a little punch and significance to a specific scene. The objects that are reflective will frequently require the hand of the visual impacts specialists to make the shot land precisely as it should.

Requirements:-

- A master shot of the scene consisting of the reflective surface
- A second shot utilized on the surface that is reflective to demonstrate the reflection we need (this is discretionary as there will probably be circumstances where the shot as of now contains what we have to reflect)

Sign Replacement





**Fig. 4.3 Sign Replacement
(Created by Author)**

Signs can be hazardous or a lifeline with regards to building up an location. Signs can be utilized to set a state of mind and recognize an area for a group of people. On the off chance that a sign is inadequately found or wrong for a film, frequently it should be supplanted. Presently VFX craftsmen make the suitable sign for a scene to catch the mind-set splendidly..

Requirements:-

- A master shot of the sign that will be changed.
- A graphic of a new sign (which will be created in Photoshop).

Removing Objects from the Frame



(Created by Author)



Fig. 4.4 Removing objects from frame.

Regardless of how thorough the moviemaker, the photography director, the area scout, and the entire crew are there will without a doubt be shots that have subjects in the frame that ought not to be there and can be evacuated.

Requirements:-

- Footage with aitem that necessities evacuating

Changing the Weather

Numerous creations just advances or proceeds at the impulse of the climate. By and

large, in the event that we have a movie maker who's justified regardless of his or her salt they will plan the shoot so it happens in the suitable area with pleasing climate. On the other hand, the climate can change on a dime. Fortunately the VFX craftsman can, much of the time, change the climate. Be that as it may, it's only one out of every odd case.

Requirements:-

- Footage of the shot that needs its weather changed.
- Replacement footage for the sky. (if needed)



**Fig. 4.5 Turning an Overcast Day into a Sunny Day
(Created by Author)**



Fig. 4.6 Turning a Sunny Day into a Rainy Day

Removing an Actor from the Frame

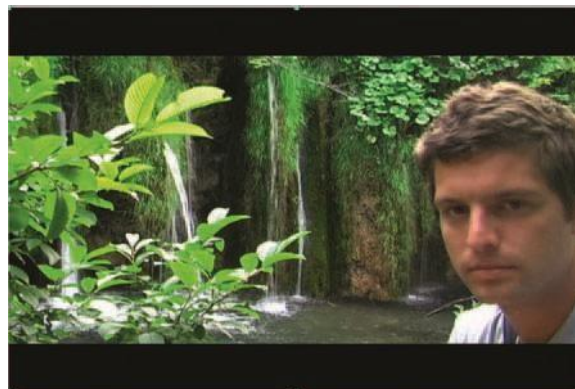


Fig. 4.7 Removing an Actor from frame

It is a typical understanding among editors, like that of magicians, to demonstrate the group of viewers something required to converge their attention regarding one place with the

goal that they will be diverted by something unique. Sometimes we may have a great shot that will be the best regardless of differences in the position of things. Here's is a suggestion of managing that, concealing the confusion.

Requirements:-

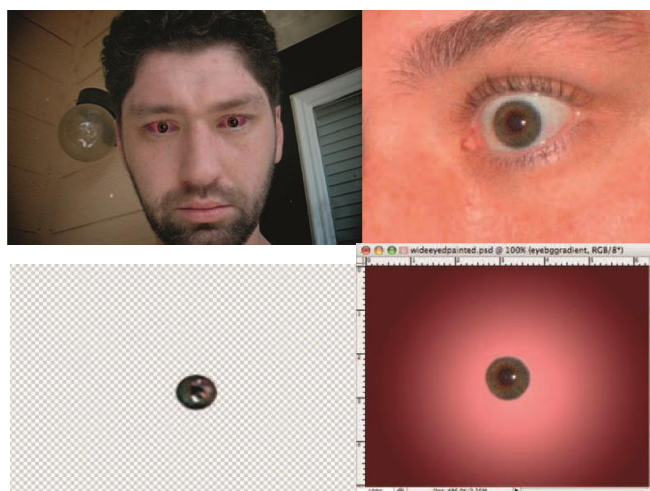
- Footage of the shot that requires a new or innovative focal point.
- Footage or still photo that may be utilized to mask or hide something.

Horror effects

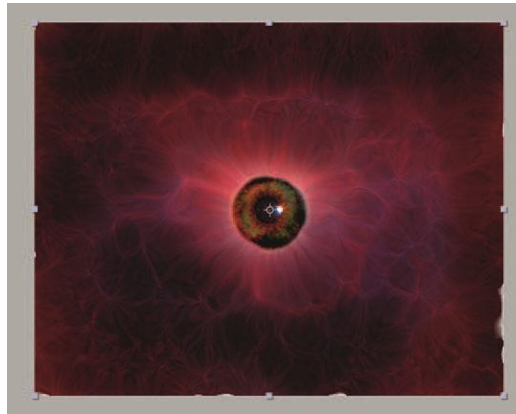
Some folks love to view movies of horror. There are few who are habituated to go for sleep after watching a horror movie. There are numerous reasons why they adore ghastliness. The reasons vary in various individuals. There are however the impacts of watching frightfulness. A few people discover horror or frightfulness fascinating and enjoyable to view. Others would not set out watch films or even short clippings of this kind.

One reason why individuals appreciate watching ghastliness is the story. As the story line of many horror movie is fascinating. The thrills and suspense in the horror movies influence the viewers to watch more movies like the same. These horror movies needs great standards of direction. The horror movies director are mindful so as to pick the best strategies utilized by the on-screen characters in making the frightful or horror films more appealing. The role or acting done in the film is additionally appreciated by most of the audience. The fearlessness delineated by a few characters in these stories inspire the majority of the audience. Other individuals appreciate watching horror movies in light of the thrilling component in the motion pictures and movies. The music that is incorporated into the movies and horror films flicks additionally persuades a few audience to continue viewing the films. So all these features of horror movies make such movies or motion pictures intriguing for the individuals who cherish viewing the subject horror


Evil Eyes







Group 2



▶

Properties Behaviors Filters Group

Parameter	Value
<input checked="" type="checkbox"/> Match Move	
Source	 Analyze Motion 1 
Type	Transformation
Direction	Horizontal and Vertical
Transform	Attach to Source
Adjust	Position Scale Rotation
Origin	Track 1
Rotation-Scale	Track 1

Fig. 4.11 Creation of evil eyes

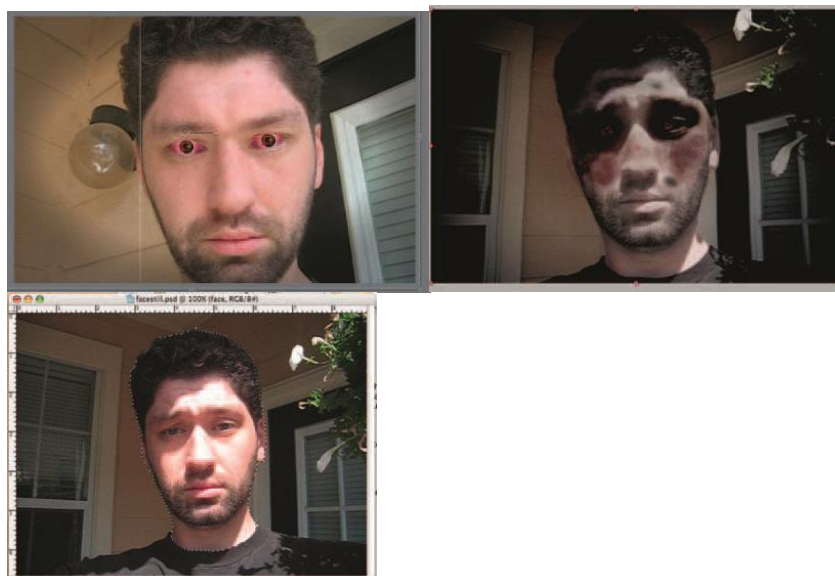


Fig. 4.12 Distorting facial features to create horror

A convention of the horror movie is Twisting the recognizable soothing face into a beast. Here we will take a performer and give him a quite irritating change. The eyes of a human is a standout amongst the most particular highlights of a person has and a little change in this marks a distinction and we could say that they have been changed into a beast.

Requirements:-

- Footage of a performing artist whose eyes we will supplant..
- Large resolution still photograph of one of the performing artist's eyes, ideally a digital macro lens close-up

Zombie Faces

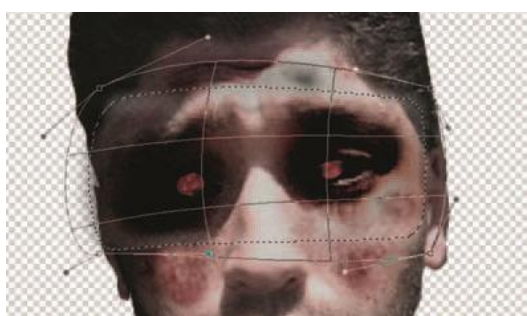




Fig. 4.13 Creating Zombie faces

Till now you have gone through the tutorials to make someone beautiful or look attractive using a Photoshop. Now let's see how to make a face look absolutely frightening or terrific.

Requirements:-

- A shot of the performing artist whose face will get our beast make-up.

Digital Dismemberment



Fig. 4.14 creating digital dismemberment

At some point or another, in most great slasher flicks, somebody lost an appendage. Here's an approach to subtract an arm, finger, or leg with a little cautious arranging and some VFX enchantment.

Action effects

As per the historical background, activity motion images have inferred two things: extensive blasts and more noteworthy spending designs. These motion pictures are frequently called as "idealist" or "popcorn" yet the activity type is furthermore very well picturized and shown in the world of cinema. In the present action film, the VFX skilled worker is routinely required to finish two critical things: save money on expensive objects, hard to-get shots and extra stand-ins from the distinctive dangers of on-set failures.

In the 1930s, most movement films were expected for period pieces, with a similar number of sword fights as the present action films rely upon gun duels. By the 1970s, the tide had swung to the cruel and tumble, not bewildered of bowing the law cop flick. In any case, the 1980s gave us the Stallone/Schwarzenegger/Willis- style of over-the-principle one man against widespread trap of mental oppressor's style that helped impact the action to film the common style in Hollywood today. By the mid-1990s, another move twisted up evidently self-evident, the effect of the Hong Kong style of action film, which joined the class with awesome "kung-fu" sort. To the dissident fresh motion picture maker, it has been a serious class in view of its prerequisite for swollen spending designs.

The best in class official normally can't stand to detonate automobiles, squash windows, affect Uzis, and have swarms of winged animals (affirm, that one we can hold just for John Woo). Since the mid-1990s, it has ended up being progressively standard for movement films to VFX over certified impacts and traps to shield movies from going course finished spending design. Look at it thusly; there aren't over and over again that you can detonate a set, should something turn out seriously. Low-spending action films, for instance, Robert Rodriguez's El Mariachi, show that with great keenness, and the instrument set, it's positively attainable. Moreover, with some VFX charm, spending designs can be saved and structures can regardless be detonated. We should encounter various typical action film shots and how, with some extremely low-fi VFX frameworks, a film can at introduce come in under spending design.

Vehicle Explosions

Creating vehicle explosions
(Created by Author)



There is a little piece of every one of us that gets some sort of fulfillment about observing something detonate. Exploding something, while at the same time adding much energy to a film, can likewise kill a financial plan. Frequently a visual impact of a blast can be a bit of frustrating, so here are a few hints on the most proficient method to influence it to feel to some degree persuading. Here's one strategy to make an extraordinary looking blast.

Ingredients:-

- Footage of the vehicle you would like to blow up (shot with the camera on a tripod).
- Footage of the background or location where the vehicle will blow up without the vehicle there.
- Stock footage of Square Flames from www.detonationFilms.com

Building Fire





Creating building fire

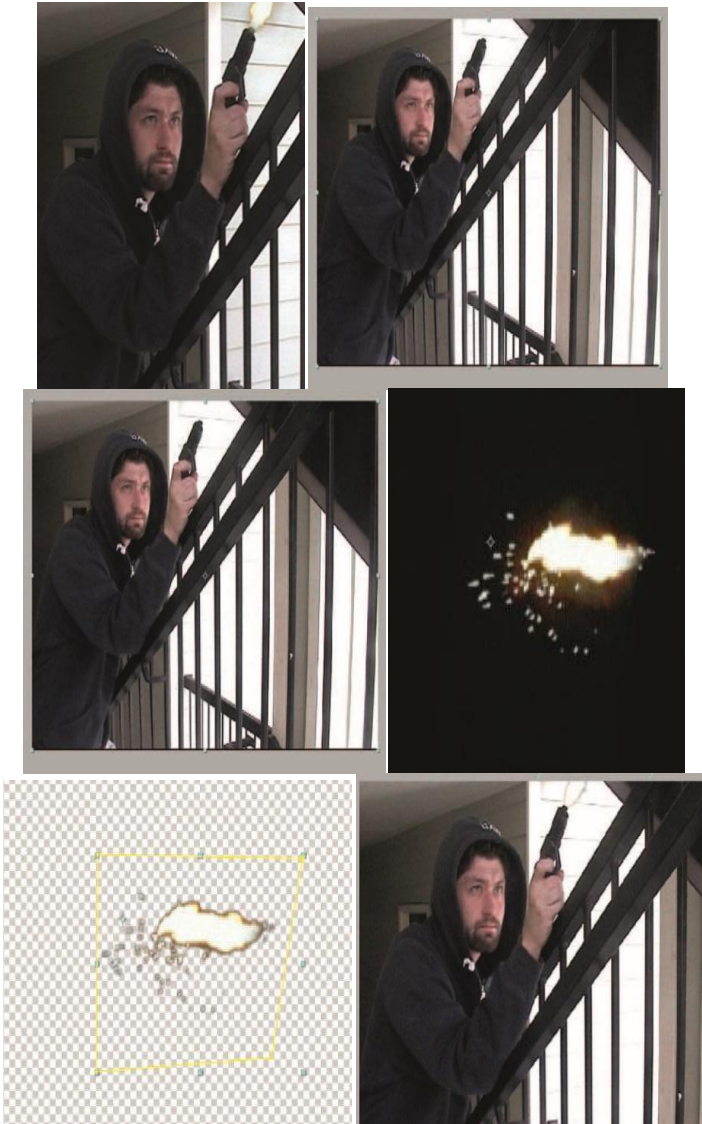
(Created by Author)

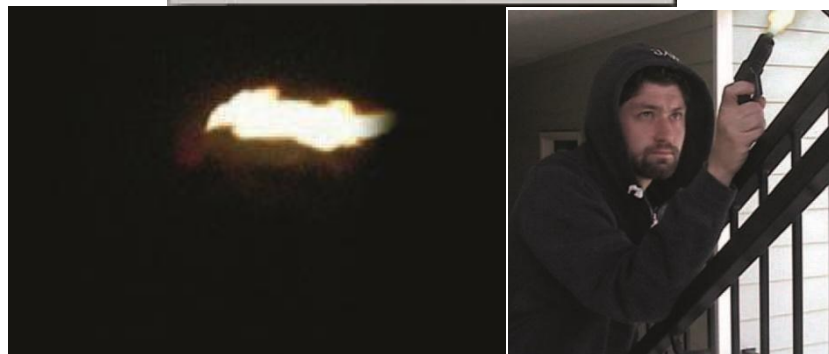
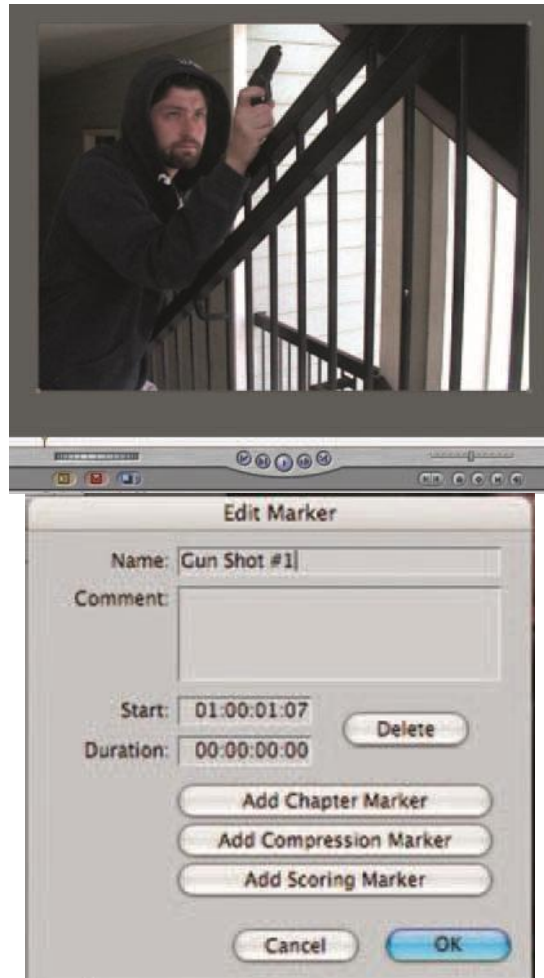
If we somehow managed to influence a best 10 to rundown of the most widely recognized inquiries from scholars about After Effects, " How would I make fire? " would be a contender for the main spot. In all seriousness, it bodes well; we favor that students are more enthusiastic to learn so they should produce fire on a PC than attempt to make genuine ones.

Requirements:-

- A master shot of the exterior of a building with windows (we are going to add the fire and smoke)

Creating Realistic Gunplay





Creating Realistic Gunplay (Created by Author)

Aside from a good gunshot sound effect, you will also need a great looking “muzzle flash” to give your chase scene a great sense of shoot them-up gunplay.

Requirements:-

- Footage of our actor firing our prop gun.
- Prop gun (Try spray painting a water gun black).

Stock shot of “muzzle fl ashes” (the one in use here comes courtesy of www.detonationfilms.com, a great resource for free and lowcost special effects stock footage)

Unit summary

This unit gave a brief introduction to VFX and its relevance in today's world. It discussed about digital compositing and computer generated imagery CGI. It also introduced the software's used to create VFX and elaborated various tools associated with VFX. It explained the process to create different effects like an action shot, a horror shot, changing weather, creating explosion, etc.

Assignment

1. What is digital compositing?
2. What are computer generated imagery?
3. What are blue screen and green screen, why are they used in VFX?
4. What is story boarding?
5. What are the advantages of using VFX?
6. Why is VFX used instead of video shooting?

Resources

1. https://en.wikipedia.org/wiki/Visual_effects
2. Byrne, Bill. The visual effects arsenal: VFX solutions for the independent filmmaker. CRC Press, 2012.

DMA-02

Digital Imaging

Block – V: Finishing and Digital Media Outputting

Unit-1 Practical- Graphics for TV Production

is intended for people who aim to create designs for print medium on canvas, T-shirt etc.

Introduction

Vibrant Graphics and Animation are very common in Television Programs to create attraction for the viewers. Television programmes are full of advanced graphics and visual effects. This Graphic design industry has emerged as a parallel part of the Video Production.

The work of pioneering graphic designers in the Design Industry has set the standards that still influence what you see on Television today.

In this unit you will learn about how to design the graphics for television. Further, we will be covering the practical portion of creating some of the Graphics for Television.

Outcomes

Upon completion of this unit you will be able to:

- *Create and place* still and animated logo for Television program.
- *Develop* the still and animated header and footer designs of a Television Program.
- *Construct* an Animated Globe using Synfig Studio.
- *Design* a 3D Animated Globe for a Television program using Blender.
- *Create* a Negative Rolling Animation using Synfig Studio.

Terminology

Blender: Open source software for 3D. It is widely used by professionals and learners. It has options which are almost matching to the professional software's.

Synfig Studio: An Open source 2D Animation Software. Apart from just drawing frame by frame, 2D Animation software has the capability of optics animation which generates frames on their own after specifying the starting point and the ending point.

PNG: Portable Network Graphics has the capability to use Transparent Background. In case of Titling and Logo placement, transparency is required in the edges, hence PNG format is capable to do so.

FPS: Frames Per Second is the speed which is specified in an animation or movement. In a real time vide the FPS used is 25 fps in PAL format and 30 FPS in NTSC format.

Birth of Graphic Design in Television Industry

In 1936, the Television Industry was born which was considered as a revolution in that era. Graphic design was an Industry which was totally considered for print media only. Any graphics which were required for the Television shot was first hand painted, then it was photographed or video graphed and brought into the video format for television. There were lots

of techniques which were required to be used for bringing the drawn shots to video so only still format of text and drawings were only used.

BBC television appointed their first graphic designer as full time employee after 20 years of its existence in the year 1954. The employee was John Sewell. A new profession emerged as the newer competitive players in the industry started adopting new strategies of their competitors so that they may move at the same pace with others without being left behind. Still, the use of Graphic design was under the control of lots of similar designs as a standard format of a letter. Artistic designs were not used at that phase. Only rectangular and circular shape with light background and dark text or vice versa were used during that period. The time taken for creating artistic content could not be afforded or utilized and the normal process itself took a long time to operate and complete. History of Desktop Publishing

The year 1983 saw a new dawn for the Desktop Publishing when James Davise, for the first time, developed a code in Philadelphia. It was for a community newspaper. In olden days, software were called Programs which were written in codes. The program was Type Processor One. It ran on computers which had a Graphics card on WYSIWYG display. In 1984, the software was released in open market commercially by Best Info.

The major breakthrough of Desktop Publishing was in the year 1985 when Apple Laser Writer Printer was introduced in the market in the month of January. In the same year, in the month of July, Pagemaker software was launched into the market by Aldus. Pagemaker has been designed in such a way that documentation of hundreds of pages can be done with convenience.

“Desktop Publishing” term is a contribution to the founder of Aldus Corporation, Mr. Paul Brainerd. In the world of expensive software and equipment’s related to colour printing techniques, Pagemaker was like an affordable solution to the artists and designers who sought computer as the future tools and technique of advanced designing.

Apart from the introduction of Desktop Publishing in those days, people faced lots of problems like small screen size, monochrome monitors, inability to use letter spacing, line spacing etc. The computer display did not accurately match the print output. The developers have strived a lot to create graphic designing software’s which are compatible with hardware’s, operating systems and output devices like printers. There has been lots of developments step by step which has given scope to the Desktop Publishing Industry to flourish.

Now in the 21st century, Advanced and High speed Computer systems have emerged, Advanced and High End Offset printers have come into existence. Due to all this, there is lots of scope in Printing Industry. Anything can be designed and printed and printing can be done anywhere. We can print on paper, we can print on canvas, print on glass as well as we can print on wood, iron and steel also. Desktop Publishing is already on an advanced mode and is

marching ahead to set new avenues for high standard design and printing.

Role of Graphic Designer in the Television Industry

Graphic design in TV industry is growing in a much higher pace. There has been advanced in the hardware segment which has given wings to the graphic designer to spread and develop the kinds of output like King Kong and Narnia which was once beyond the imagination.

As there are lots of options, hence the role of Graphic designer has expanded many contexts as follows:

- Creating the Titles at the beginning of a program and also the End credits of a Program
- Creating the identity of the Television channel through Logo Design and specific colour schemes.
- Creating the Graphic Props required for a program
i.e. Backdrop of news channels with vibrant graphics and animation.
- Continuous Animated Contents like scrolling of text, animated text etc. for News channels and music channels.
- Changing the formats and sequences monthly or quarterly as desired by the channel. Now-a-days in channels, same format is not accepted for long, so a graphic designer is always required to generate new content every time.
- Print related Graphic required like Poster of a T.V. program, Hoarding of Channel advertisement etc.

Use of Computer and Software's for design in the Television Industry

The film rostrum camera was the source of creating designs for Television in the olden time. It is basically used for creating vertical scrolling contents of text in the titling of a serial or a program. Rostrum camera is a vertically mounted camera. It has the capability to move up and down on the area where the artwork is kept. This helps in producing the movement which we call Animation.

Emergence of Computer and Computer Graphic software totally changed the scenario of the Television Graphics Industry. Now with minimum effort lots of excellent and eye catching designs are produced with the help of advanced graphic software's. It has reduced the work of excess dependence of camera for graphics. They are created from the scratch in computers either in 2D or 3D. Readymade templates are also available in the market which makes the work easier for designers as they don't have to build everything on their own. They are choosing readymade designs which are called templates and just change the text, logo, graphics etc. to produce an original content.

Output Formats for the Television Industry

NTSC and PAL are the standard format which is used in all the places. Now with the emergence of HD Televisions, HD [High Definition] formats are also used. The output video remains the same, but there are some changes in its size specification and frame rate (fps).

NTSC means National Television Standard Committee. Its frame size is 720 x 480 pixels and the frame rate is 30 frames per second. It is mostly used in western countries where the monitor size or Television size is in the ratio of 16:9.

PAL means Phase Alternate Line. Its frame size is 720 x 576 pixels and the frame rate is 25 frames per second. It is mostly used in Asian countries where the monitor size of Television size is in the ratio of 4:3.

HD means High Definition. HD comes in various sizes i.e. 1920 x 1080, 1280 x 720, etc. The final size depends upon the requirement of a place or the output media.

Apart from Television, now-a-days lots of different platforms have come into existence like Mobile, YouTube Videos etc. Hence a same video output is resized to fit various platforms and used across all for the convenience of the viewers.

Still Logo Design – Setting the logo design in Krita

A.

- Go to google.co.in.
- Go to Google Images
- Search for a 3d globe. Type “3d globe png”

PNG format is a pre transparent background which makes it easier to place an image. The transparent background is represented through a grey and white grid.



Title: World Globe

Attribution: qimono [User name as per Pixabay]

Source: Pixabay

Link: <https://pixabay.com/en/world-globe-earth-planet-blue-1303628/>

From the displayed image, choose an image of your choice. Be sure that the background is in Grey and white shade (the grey and white shade represents transparency in computer screen).

- Save the file in a folder in your PC.
- Open Krita

Let us pre assume that we are creating a file for HD format.

Note

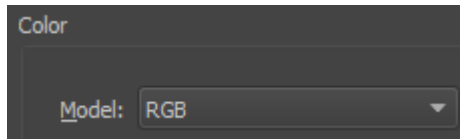
HD format – 1920 x 1080 pixels PAL

format – 720 x 576 pixels

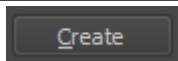
B.

- Create a New file in Krita.
- File – New -

-  pixels.
- Color Mode – RGB



Click on Create




- File – Open – Choose the saved 3D Globe photo.



- Select Menu – Click on Select All.
- Edit Menu – Click on Copy.

C.

- Go to the new HD file which you have created earlier.
- Edit Menu - Paste
- Transform Tool - 
- Scale and place it in a corner as a logo is placed.
- Remove the Background layers. Right Click on the Layer – Remove Layer (Shift + Del is the shortcut)
- Save the output file in the PNG format so that it can be used in the editing track with transparency.

The saved file can be used a logo layer file in the editing software.

The individual Png file can also be placed directly in the editing track without Krita edit also.

Note

Creating a completely transparent file with only a logo will be helpful in future in placement of logo.

Activity

Reference Collection

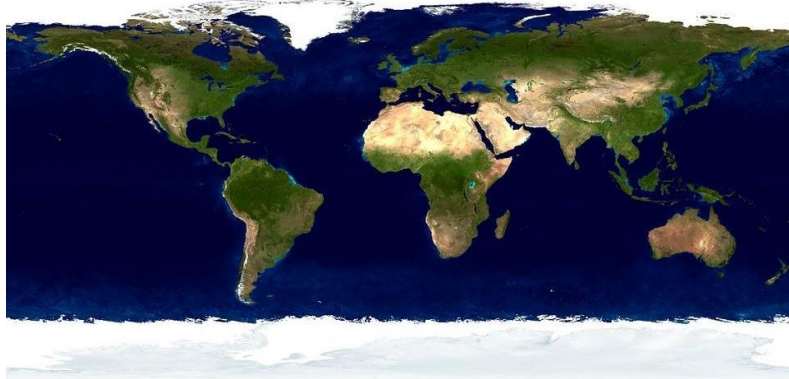
Make a collection of most of the logos of TV Channels and save it in your reference

folder in PNG format.

2D Animated Globe Logo – Synfig Studio

A. COLLECTING THE MAP FILE

- Go to google.co.in
- Go to google images.
- Search for globe texture. Type “globe texture” in the search box.
- Choose the texture which you feel suitable.



Title: World Globe Map Texture

Attribution:

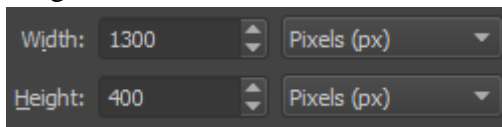
Source: Pixabay

Link: <https://pixabay.com/en/nasa-map-day-ocean-earth-ice-140636/>

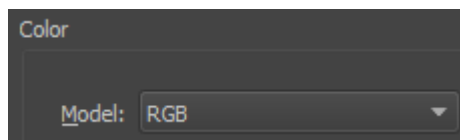
- Save the texture file in a folder in your PC

B(1). CREATING A NEW FILE IN KRITA

- Open Krita
- File – New –
- Width – 1300 Pixels
- Height – 400 Pixels




- Color Mode – RGB




- Click on Create 

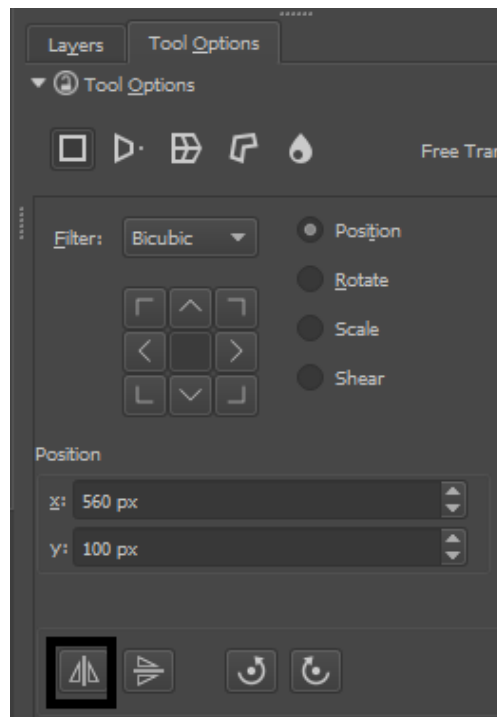
B(2). RESIZING THE MAP FILE IN KRITA

- Open the Globe texture file saved in your PC.
- Select Menu – Click on Select All

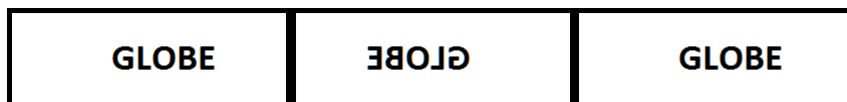
- Edit Menu – Click on Copy
- Go to the new file created earlier of 1300 x 400 pixels.
- Edit Paste.
- Transform tool - 
- Resize the globe as required.
- Right click on the globe layer – Click on Duplicate Layer.
- Right click on the globe layer – Click on Duplicate layer again.
- Move and place the layers as shown below.



- Select the middle globe – Transform Tool  – Tool Options - Flip Horizontal



[Screenshot]

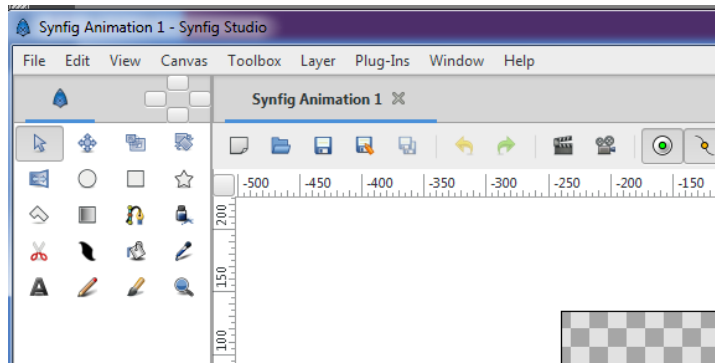


[Screenshot]

- Select the globe area only.
- Image Menu – Trim to Selection
- Now save the file in jpg form named globeani.jpg

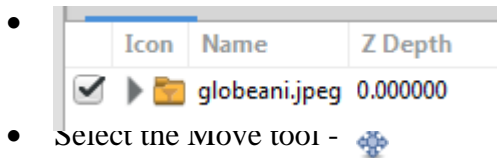
C. CREATING THE ANIMATION IN SYNFIG STUDIO


- Open Synfig Studio

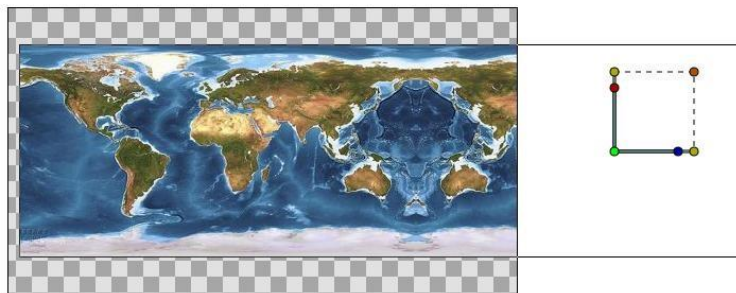


[Screenshot]

- File – Import – Choose the globeani.jpg file
- Select the file.

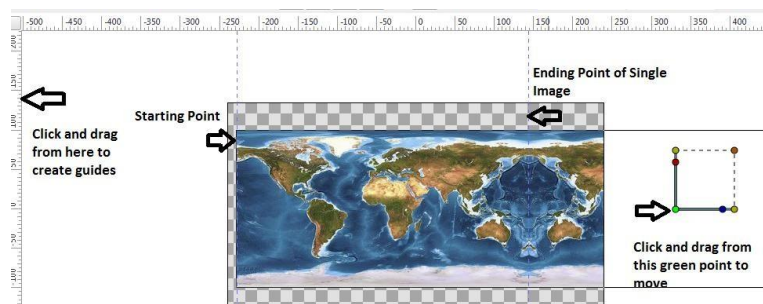


- Select the MOVE TOOL - 
- Move the image and place the starting point near the starting area of the file.



[Screenshot]

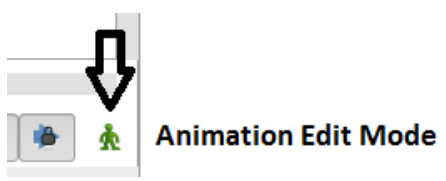
- Create two guideline. One at the starting point of the image. Second at the ending point of the single image [not at the ending point of the whole image]



[Screenshot]

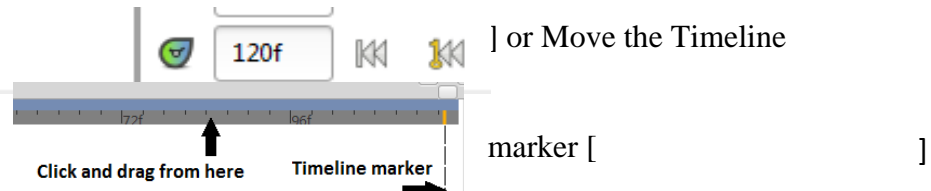
- Now we are in the first frame.

- **First frame** [0f]. Of indicates first frame
- Now Turn on the Animation Editing Mode.

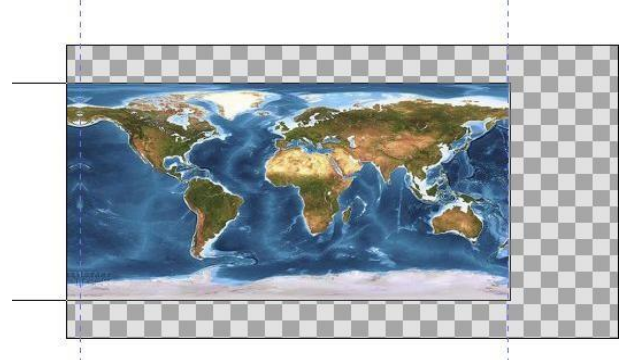


- After turning on the Animation mode the symbol changes to [Animating Stick Figure Icon].

- Select the image.
- Move tool.
- Move the image slightly to create a Keyframe in the beginning.
- Now go to the 120th frame. [Type 120f in the frame area -



- Move the image until it reaches the end point of the whole image matching the end point guide which we have created.



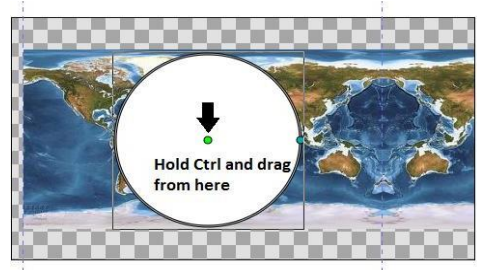
[Screenshot]



- Play the animation.

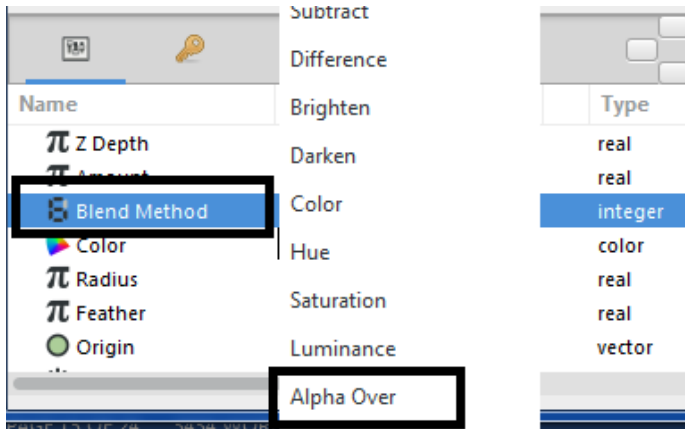
D. CREATING THE CIRCULAR MASK

- Turn Off the Animate Button. [Lock Icon, Animate Icon]. The symbol changes to [Lock Icon, Stick Figure Icon].
- Go to the first frame – 0f.
- Choose the Circle Tool – Create the circle as shown.

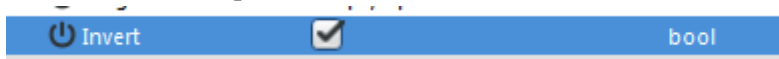


[Screenshot]

- Go to Blend Method – Change to Alpha Over



- Select the Invert Option.

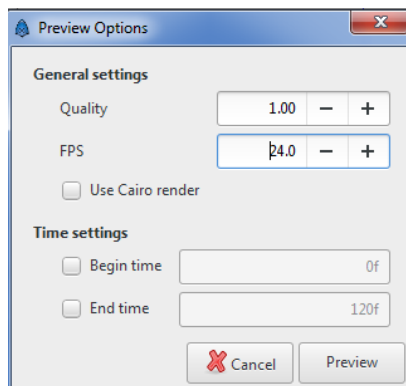


- Now Play the Animation



E. PREVIEWING AND EXPORTING THE ANIMATION

- Go to File Menu – Preview



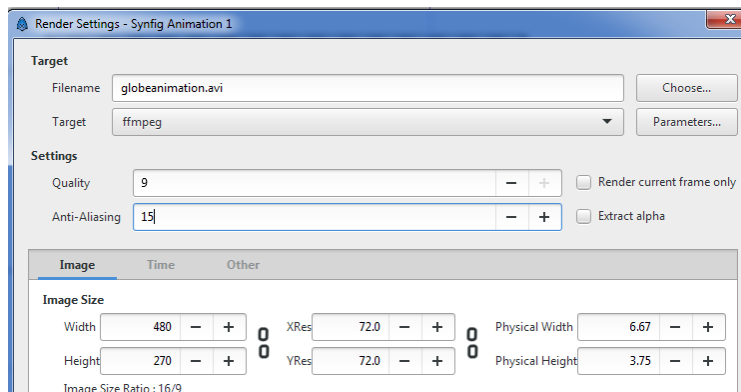
[Screenshot]

- Click on Preview
- Play and check the output.
- Go to File Menu – Render



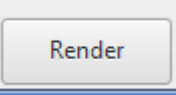
- Choose the destination to save.

- Type the file name as – globeanimation.avi
- Target – ffmpeg format.
- Quality – 9, Anti-Aliasing - 5
- Image size – Let it be as default.



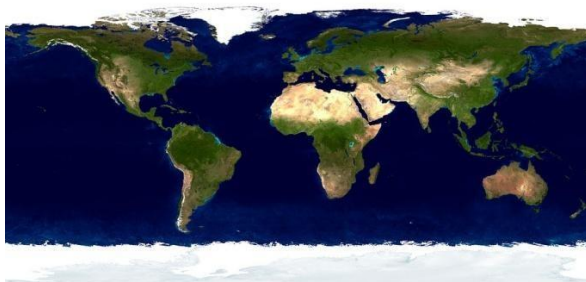
[Screenshot]


- (The above settings may vary from system to system)

- Click - Render 
- **Rendering C:\Program Files\Synfig\bin\globeanimation.avi**
- Wait for the rendering to complete.
- **File rendered successfully (3.613206 sec)**
- Now go the destination folder and Play the animation.
- This animation can be used in the Editing Track for creating Television Graphics.

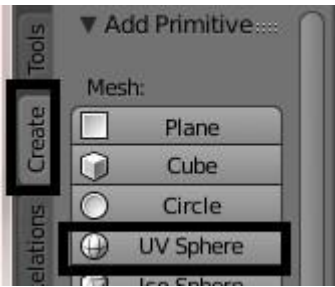
3D Animated Logo - Blender

- Open Google Chrome
- Go to google.co.in
- Go to google images.
- Search for globe texture. Type “globe texture” in the search box.
- Choose the texture which you feel suitable.

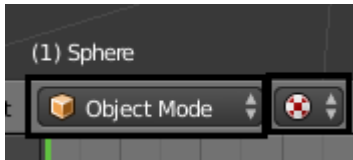


- Save the texture file in a folder in your PC.
- Open Blender  blender

- Go to Create – UV Sphere



- Object Mode – Texture



- Material Tab



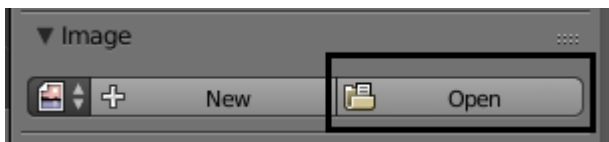
Left Click on New Material

- Texture Tab



- Left Click on New

- Type – Image or Movie

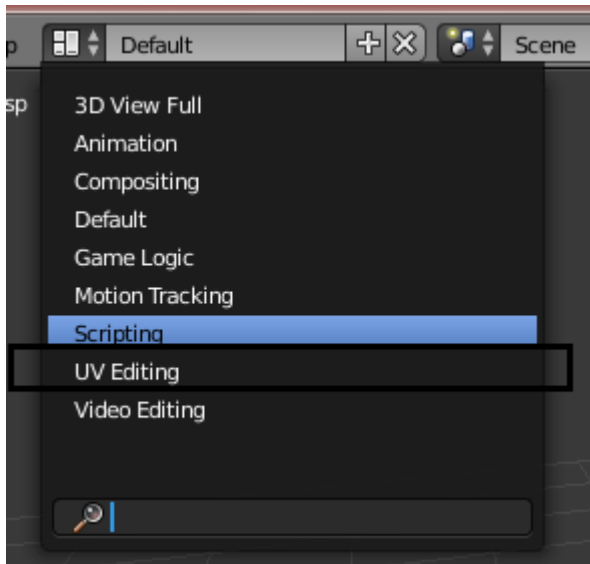


- Left Click on Open



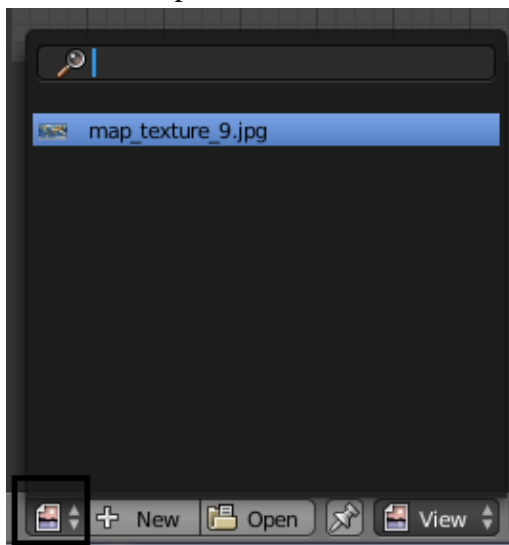
[Screenshot]

- Choose UV Editing Mode

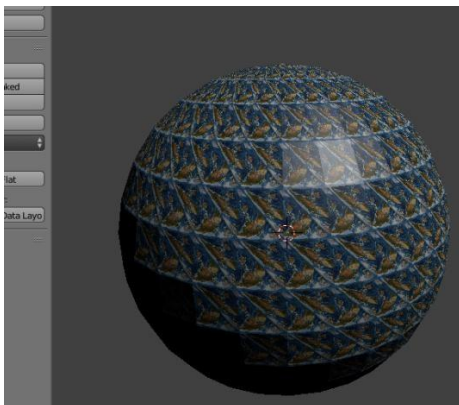
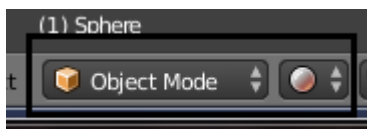


[Screenshot]

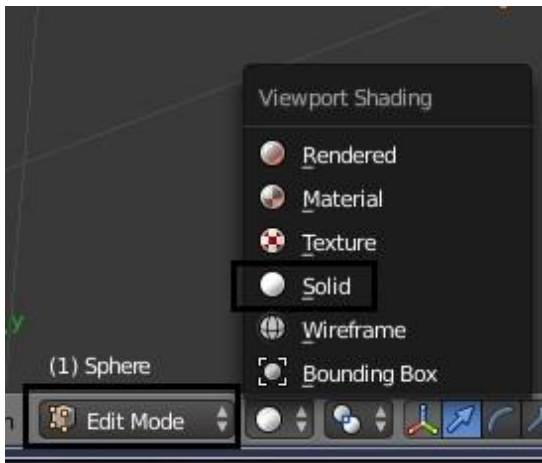
- Choose the Map



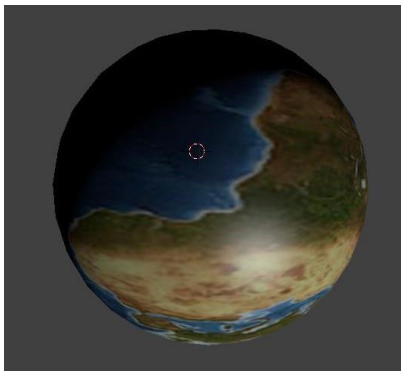
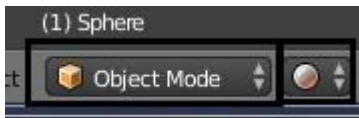
- Object Mode – Rendered



- Edit Mode – Solid

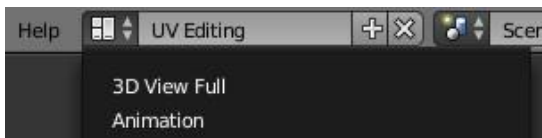


- Press “A” to select all
- Press “U”
- Select Sphere Projection
- Shading – Smooth
- Object Mode – Rendered



[Screenshot]

- Go to “Animation” Mode



- Press R – Rotate slightly to create a keyframe
- Object Mode – Material
- Go to 60th frame
- Go to object mode



- Change the Rotation Axis
- Z Axis to 360
- Press the Play Button
- Rendering - Animation



Render Presets – HDTV 1080p End Frame – 60

- Output – Select the folder
- File type – Avi RAW format
- Left click on Animation

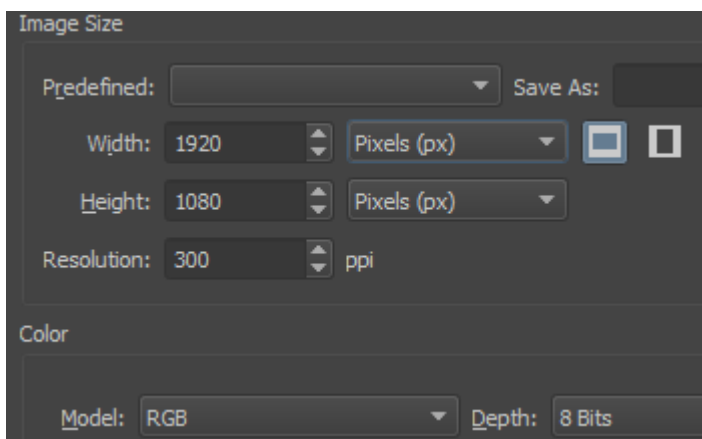
The Render file can be used in any Video Editing software as 3d Globe Graphics.

Video Reference

Video Tutorial Link of the above Chapter: <https://youtu.be/NqSAgoR2UJ4>

Still Header and Footer Design - Krita

1. Open Krita.
2. File –New



- 3.

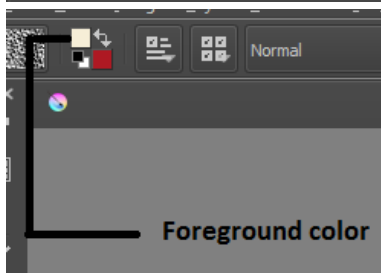
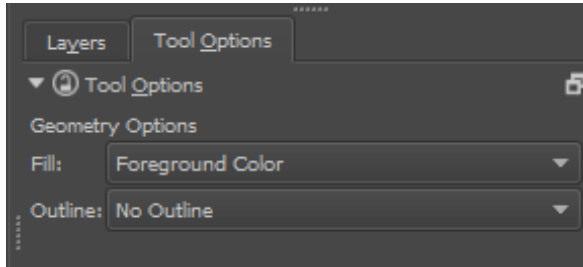
[Screenshot]

4. Width – 1920 Pixels, Height – 1080 Pixels, Model - RGB

5. OK

Bottom Design

- Rectangle Shape Tool
- Tool Options –
- Fill – Foreground Colour
- Outline – No Outline



Screenshot

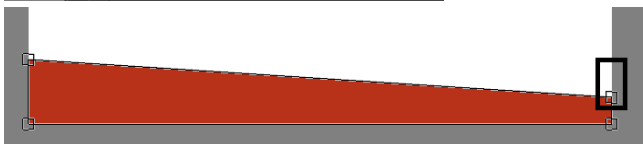
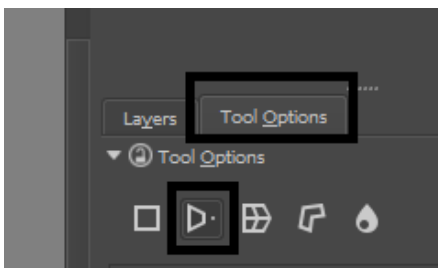
Screenshot

- Create the rectangle shape

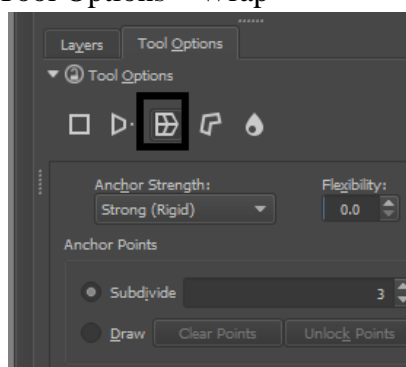


- Transform Tool 

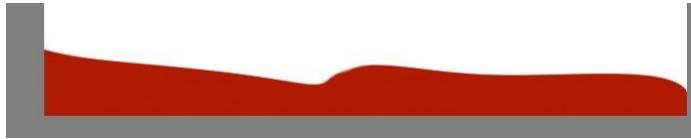
- Tool Options – Perspective



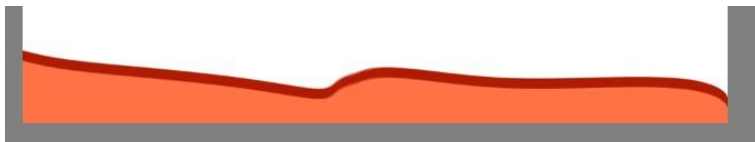
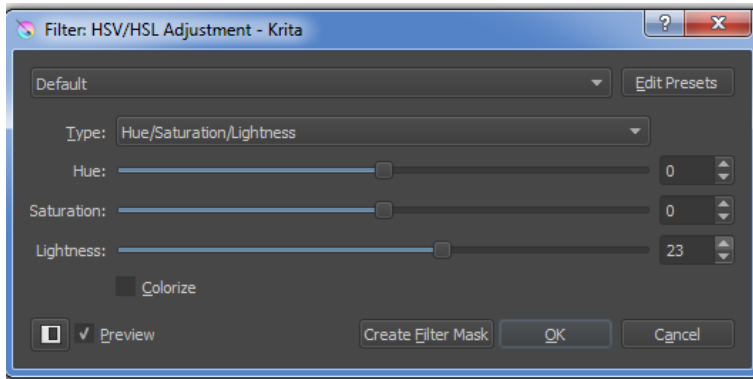
- Tool Options – Wrap



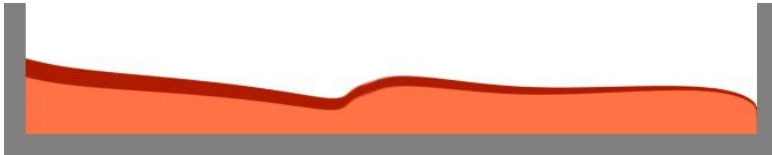
- Change the above options as required and do the adjustments



- Select the layer – Right click – Duplicate Layer (Ctrl+ J)
- Move to the bottom
- Filter Menu – Adjustment – HSV Adjustment – [Increase the lightness]



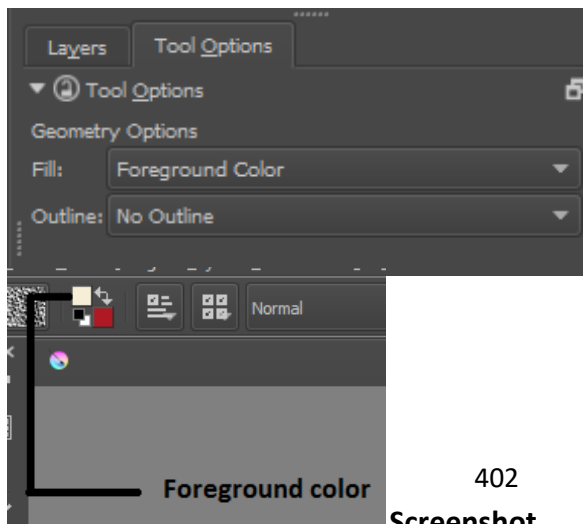
- Transform tool – Rotate the design



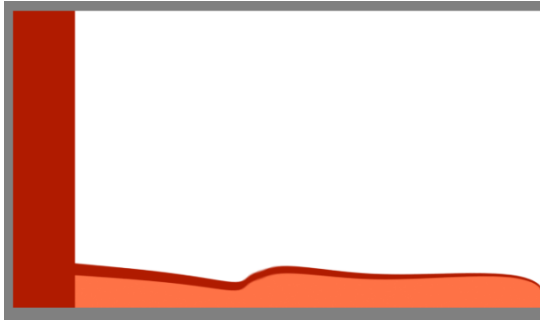
[Screenshot]

Left Design

- Rectangle Shape Tool
- Tool Options –
- Fill – Foreground Colour
- Outline – No Outline



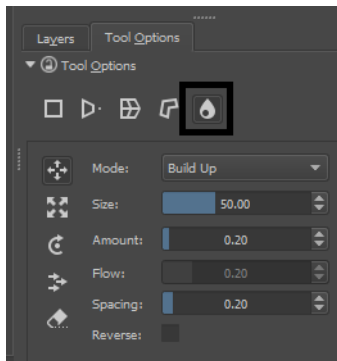
- Create the rectangle shape



[Screenshot]

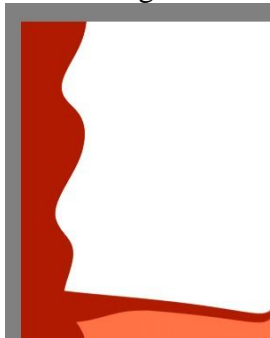
- Transform Tool 

- Tool Options – Liquify

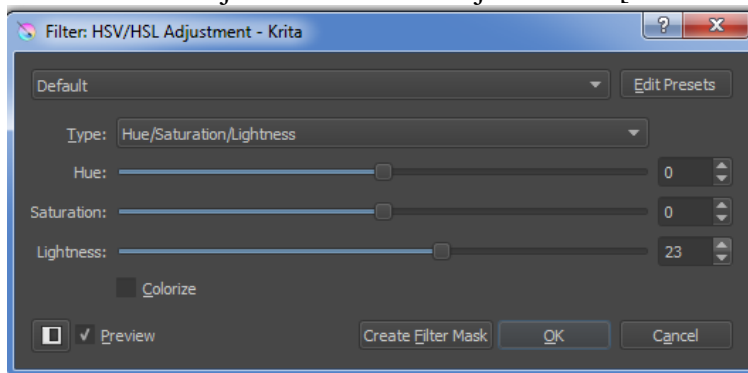


Screenshot

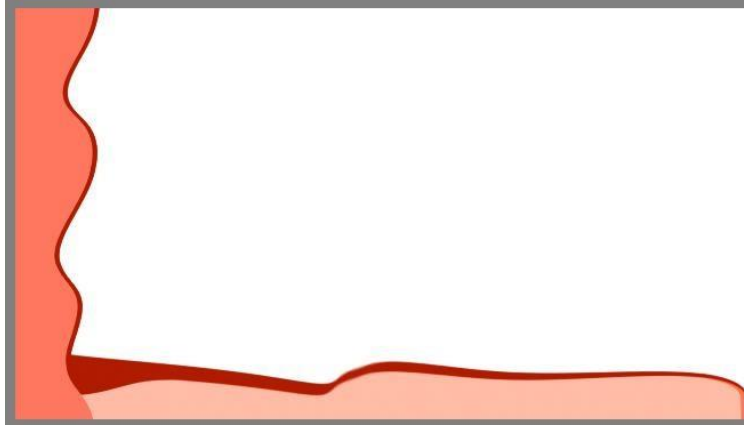
- Click and drag on the shape for adjustments



- Select the layer – Right click – Duplicate Layer (Ctrl+ J)
- Move to the left
- Filter Menu – Adjustment – HSV Adjustment – [Increase the lightness]



[Screenshot]



[Screenshot]

- Save the file in PNG format.
- Import the file in Video Editing software for using the design.

Text Animation using Blender

In this section we will cover the following:

- Writing Text in Blender.
- Writing a word Alphabet wise.
- Animating the word Alphabet wise.
- Rendering the Scene.


Practical Process:


- Open Blender

- Press Delete Button keyboard – Click Delete button on screen.  . It will delete the existing object.

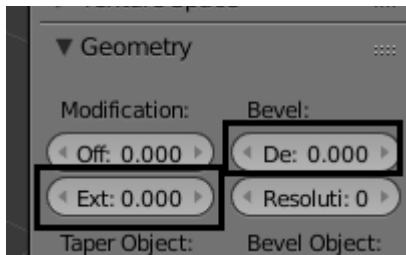
- Go to Create Menu - 

- Click on Others – Text - 

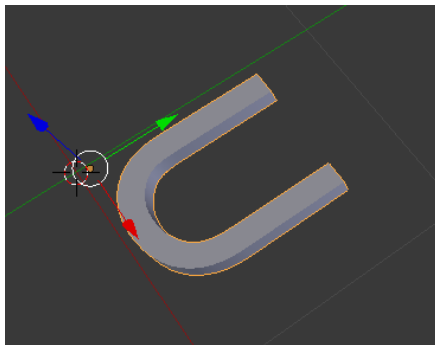
<ul style="list-style-type: none"> • Go the Top Right hand side corner. Search for Text by scrolling down. Click ‘+’ by the left side of Text. The panel will be expanded and you will find another text below. 	<p>or</p>	<ul style="list-style-type: none"> • Go to Edit Mode -  • Backspace and Change the Text to “N” • Change to Object Mode -
--	-----------	---

<ul style="list-style-type: none"> • Click on the Text • On the screen in the middle you will find a cursor to the right. Backspace and delete the existing text. • Type your required text. Suppose I type “U”. 		
---	--	--

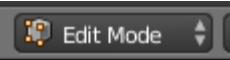

- In the right hand side corner - Click on “” – Data – Object Data. 
- Go to the Geometry Section

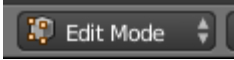







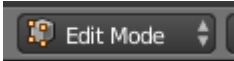






- **Screenshot**
- Increase the Extrude value.
- Increase the Bevel De:
- The output will look as follows:
- Use the Scroll Mouse to Rotate the View
- Use the Shift + Scroll Mouse to Pan the View




[Screenshot]


- Now we will type the word “UNIVERSITY” i.e. “U”, “N”, “I”, “V”, “E”, “R”, “S”, “I”, “T”, “Y” separately.
- Press “Shift + D” [Shortcut of Duplicate]
- Move it to the right side of first “U”
- Go to Edit Mode - 
- Backspace and Change the Text to “N”
- Change to Object Mode - 

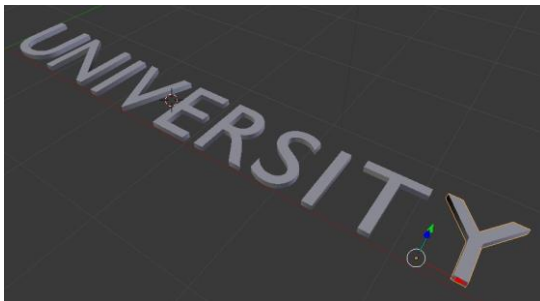
- Press “Shift + D
- Move it to the right side of “N”
- Go to Edit Mode - 
- Backspace and Change the Text to “I”
- Change to Object Mode - 
- Press “Shift + D
- Move it to the right side of “I”
- Go to Edit Mode - 
- Backspace and Change the Text to “V”
- Change to Object Mode - 
- Press “Shift + D
- Move it to the right side of “V”
- Go to Edit Mode - 
- Backspace and Change the Text to “E”
- Change to Object Mode - 
- Press “Shift + D
- Move it to the right side of “E”
- Go to Edit Mode - 
- Backspace and Change the Text to “R”
- Change to Object Mode - 
- Press “Shift + D
- Move it to the right side of “R”
- Go to Edit Mode - 
- Backspace and Change the Text to “S”
- Change to Object Mode - 
- Press “Shift + D
- Move it to the right side of “S”
- Go to Edit Mode - 
- Backspace and Change the Text to “I”
- Change to Object Mode - 

- Press “Shift + D
- Move it to the right side of “I”
- Go to Edit Mode - 
- Backspace and Change the Text to “T”


- Change to Object Mode - 
- Press “Shift + D
- Move it to the right side of “T”


- Go to Edit Mode - 
- Backspace and Change the Text to “Y”

- Change to Object Mode - 
- Final View looks like this –



[Screenshot]

- Now Activate the Animate Keyframe -  .
- Suppose we need to make an animation @ 25 frames per second for 6 seconds i.e. $25 \times 6 = 150$ frames.
- Hold - Ctrl + Click and drag to select all the alphabets like a lasso selection.
- Click on 150th frame.

- Create the keyframe – Click on 
- Click on Keyframe – Yellow Marker -

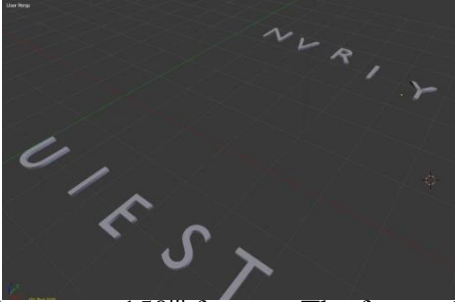


Screenshot

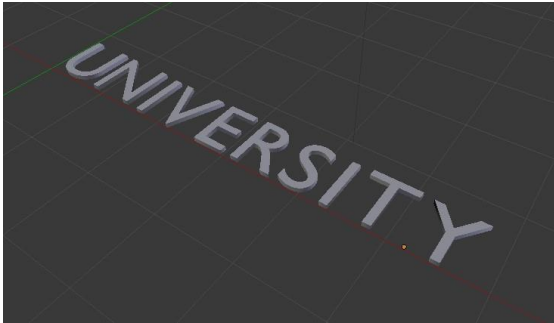
- Choose Location –

- Click on Key - 
- Go to 0 Frame
- Deselect all the shapes – Ctrl + Shift + Click and drag around alphabets like a lasso selection.
- Go to 0 frame
- Select only “U” – Right Click on “U”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “N” – Right Click on “N”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “I” – Right Click on “I”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “V” – Right Click on “V”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “E” – Right Click on “E”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “R” – Right Click on “R”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “S” – Right Click on “S”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “I” – Right Click on “I”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “T” – Right Click on “T”
- Choose Translate and Move it beyond the view.
- Press “A” to Deselect
- Select only “Y” – Right Click on “Y”
- Choose Translate and Move it beyond the view.

- The final 0 frame view should look like this.



- Now go to 150th frame – The frame should look like this.

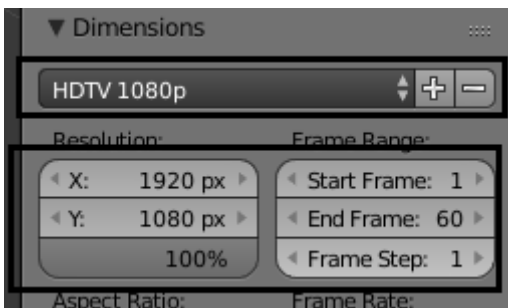


[Screenshot]

- Now go to 0 frame and Play -
- Now Zoom near to the text “University”
- Now Render for the final output.
- Rendering - Animation



[Screenshot]



[Screenshot]

- Render Presets – HDTV 1080p
- End Frame – 60

- Output – Select the folder
- File type – Avi RAW format
- Left click on Animation

The final rendered file can be used in Titling Effects in documentaries, serials, films etc.

Activity

- Study Graphic Animations in YouTube and try to identify the software's in which they would have been made. Try to utilize your skills and learning to develop that kind of Graphics.

Summary

In this unit you learnt about designing television graphics. There are several tools and software's for designing graphics. You can search more on the web and learn which are important to you.

Assignments

- Create a Logo with a 3D Globe image in the Krita.
- Create an animated 3D Globe using Synfig Studio.
- Create an animated 3D Globe using Blender and Render it in an “avi” file.
- Create a Header and Footer design in Krita for a Television Program.
- Create a Text Animation using Blender.
- Write all the above Assignments in DVD using Nero with the video output, raw source files of the software used and submit it to the University.

Assessment

- _____ is the open source 3D software used for creating Television graphics in this unit.
- _____ is the open source 2D software used for creating Television graphics in this unit.
- _____ is the graphic design software used for creating Television graphics in this unit.
- _____ is the full form of FPS.
- _____ is the frame rate of PAL format. is the frame rate of NTSC format.

Unit 2 Practical- Create colourful Vector character art in Krita

Introduction

Character Designing is a full-fledged job of an artist in a film or a comic book or a story, or an advertisement etc. Whenever you plan to go to a movie, you first try to know about the name of the hero, heroine, side actors, villains etc. After knowing that you have a rough idea of the movie based on your previous experience. In the same way, the looks of the character plays a big role in the output of the presentation. It attracts the audience to view the product or film.

In this unit you will learn how to create vector character design in Krita and Inkscape which are one of the software's for designing different types of characters.

Outcomes

Upon completion of this unit you will be able to:

- *Sketch* a character.
- *Use* the software Krita.
- *Use* the software – Inkscape for Vectoring the Art.
- *Create* a complete character design using Krita and Inkscape.
- *Evaluate* the different formats of output of a design.

Terminology

Vector: The shape used by software's which are not distorted while enlargement as well as consumes only less space.

Raster or Bitmap: Photographs or images made up of pixels or dots which represent the information of position as well as the colour of the pixel. It consumes more space as compared to Vector based shapes.

Character design: Visualising and creating the Design of a person, animal, a cartoon etc. using the characteristics of the above.

PNG format: Portable Network Graphics (PNG) is a raster graphics file format that supports lossless data compression.

TGA format: True vision TGA, often referred to as TARGA, is a raster graphics file format.

TIFF format: Tagged Image File Format, abbreviated TIFF or TIF, is a computer file format for storing raster graphics images, popular among graphic artists, the publishing industry, and photographers.

Steps for Character Design

- First, the script of the project is written and all the characters are established in writing.
- Next, a Character Designer is hired and the described character is given to him. The character designer and the director discuss about the details of the character like the height, the mood, the dress, the posture etc.
- After getting the brief the character designer starts his sketching.
- The sketching goes in various rounds with inputs and corrections from the director.
- Once the sketch of the character is finalized, it is scanned and taken to the digital department.
- In the digital department, it is created using vector graphic software's. Vector graphics is preferred because it does not get distorted on enlargement. A small design can be enlarged to huge size also.
- After the lining, it is coloured by the artist through the software's and the final output is created.

In this unit, we have prepared an outline sketch and will learn to create the digital output with colours.

There are few things which you should know and for which you should be prepared.

Tip

- An Artist and a Digital Artist. Both the designations seem same, but are different from one another. An artist learns art from pencil and it is movement of his hands which creates the art. The Digital Artists uses the tools and technique of the software's to create a better output of the hand drawn art with the help of vector shapes and colours.
- A multimedia learner is not compulsorily to be a great artist to create a great output. You will be surprised to know that in the Graphic Design Industry, 70% and above people belong to categories other than professional passed Artists from Art related courses.
- Art comprises not only of drawings, but there are lots of departments in Art. For e.g. Drawing Department, Digital Drawing Department, Colour department using software's, Layout Department, Composition Department etc. All these together create a great art. It is not a One Man Show. So learn the process and try to be expert in your own Area.

Krita – Open Source Software for Designing

There are lots of open source software's which are available in the market for image processing and designing works. One of the popular and widely used software is Krita. It has got all the capabilities of creating a successful design required for commercial works.

The word “Krita” is a Swedish word. It means “to draw” or “chalk”. The name was

assigned after the name “KImageShop” and “Krayon”. These former names were not going well with the software hence “Krita” is finalized.

Open source software’s means any person can access the software code and add or modify options. Any person can write code and benefit to the company or community by their efforts and earn recognition for them. These open source software’s have created a good platform for users who cannot afford or purchase costly commercial software’s.

Note It

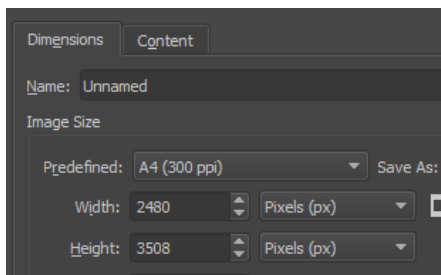
You have already studied the software Krita in Block 3 – Image

Development on different Graphic Software, Unit 1- Krita – Familiarization with interface - Tools and Features.

Hence, we will only focus on the tools required for the character design.

Practical – Technique 1 – Drawing and Tracing in Krita

- Draw a rough sketch of your own choice.
- Take the photograph of the sketch in digital format.
- Open Krita
- Create a new file of A4 Size



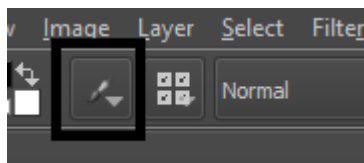
Screenshot

- Copy and Paste your sketch drawing file.



- Create a New Layer
- Trace the outline with your desired brushes.

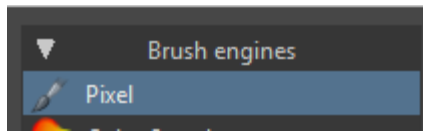
-  Bezier tool is an excellent tool for tracing in Krita.



- Brush Options

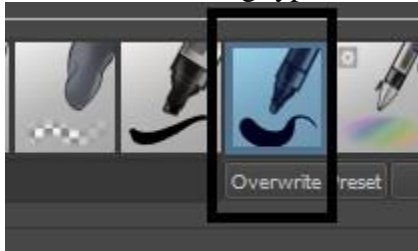
Screenshot

- Brush Engine – Choose “Pixel”.



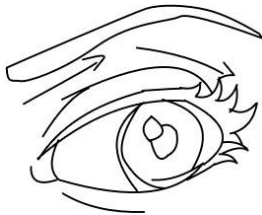
Screenshot

- Choose the following type of brush.



Screenshot

- Now start the tracing.



- Hide the other layers except the drawn layer
- File – Export – PNG format.

Note It

Do it patiently. It will take about 20 to 30 minutes to bring perfection in drawing.

Inkscape – Open Source Software for Designing

Inkscape is a vector based open source software used by people in the industry. Designs which are related to shape are mostly done using Inkscape.

It has lots of ready-made tools and options required to create advertisements, shape related designs such as logo, visiting card etc. It has the ability to create lots of textures and manually created shade of designs.

It is inherited with the capability of creating lots of variety of output formats. The export capability into various formats of a design makes it usable in most of the platforms available in the computer operating system.

Note It

You have already studied the software Inkscape in Block 3 –

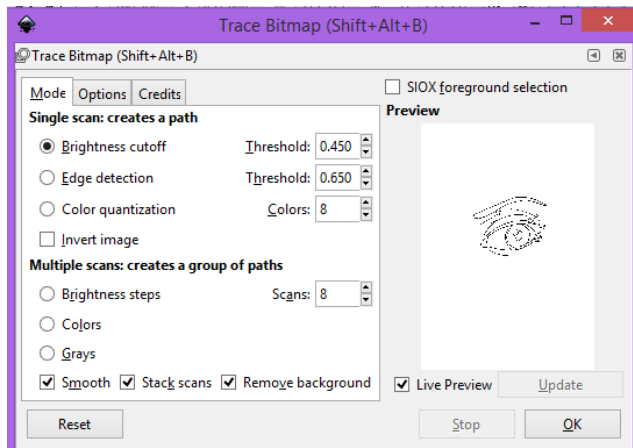
Image Development on different Graphic Software, Unit 2 - Familiarization with interface of Inkscape.

Hence, we will only focus on the tools required for the character design.


Practical – Technique 2 - Vectoring

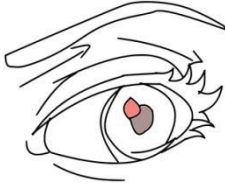
- Open Inkscape
- File – Import – [Choose the eyes file drawn in Krita]

- Path Menu – Trace Bitmap



Screenshot

- Now your shape is in Vector format.
- Choose the fill tool  and colour as required.



OUTPUT FILE -

Total Structure of a Character Drawing

First of all, before entering into the software interface, we have to prepare a complete sketch of the character drawing manually on a piece of paper. We will now study all the elements of a character design one by one.

Character Anatomy

The designer first creates the character anatomy with the features which are assigned to him. An overview anatomy and drawing of the character is shown in Fig A, B & C, and a technique of digitization is described.

Practical – Technique 2 – Outline Vector Drawing

- Take a Photograph of Figure A as shown below using any Smartphone.
- Transfer the Photograph to your computer.
- Open Krita
- Open the Photo of Figure A
- Select Menu – Select All
- Edit Menu – Copy



Fig. A

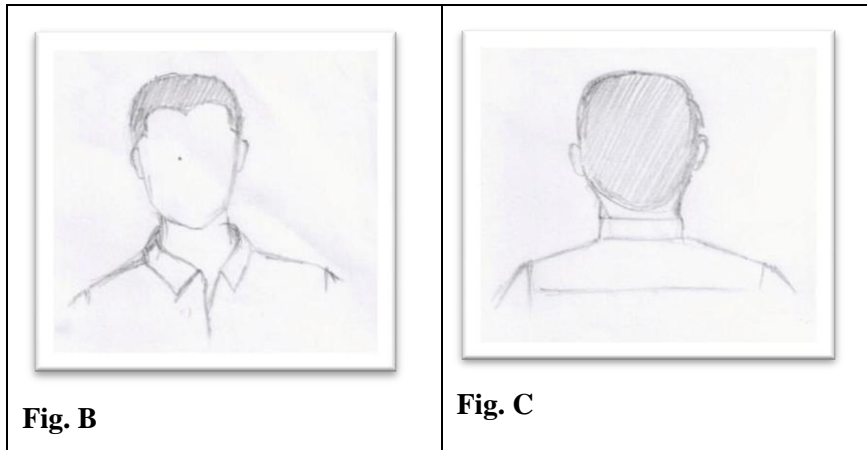

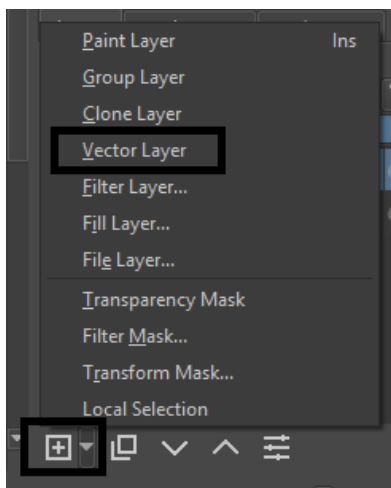


Fig. B

Fig. C

[Drawn by the Author]

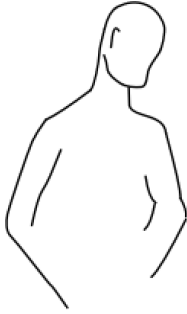
- File - New [Choose any size]
- Edit – Paste
-  Transform the Photo and resize according to the screen.
- New Vector layer




Screenshot

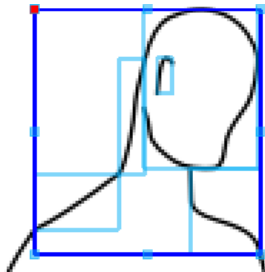
- Choose Brush Tool  Brush Settings -  - Choose a Round Brush
- Choose Bezier Curve Tool - 
- Click and draw the outline shape – Press Enter

- Continue the above process till completion.
- Work in Progress –






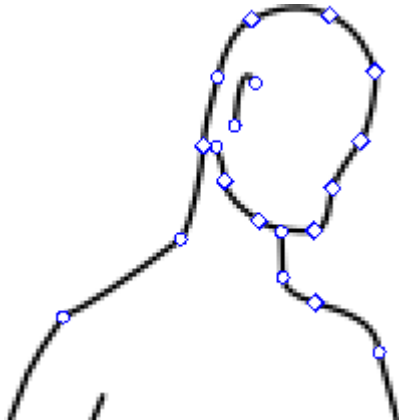
[Screenshot]

- We can adjust the points after drawing the lines also.
- Choose the shape manipulation tool. 
- Left click and drag over a shape.
- It will get selected as shown.



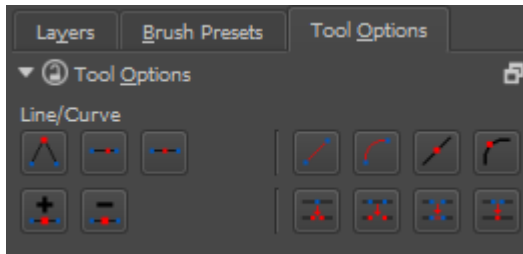
[Screenshot]

- The bottom tool under this Shape manipulation tool  will change to Path Editing tool 
- Choose the Path Editing tool 
- Click and move to adjust the points.



[Screenshot]

- Go to Tool Options – We have got extra options like Add points, Remove points etc. to modify the shape further.



-
- After the complete drawing, save the file in Krita [File – Save]
- Save the file in JPG format also [File – Save]- Under the “Save as type” option choose JPG.

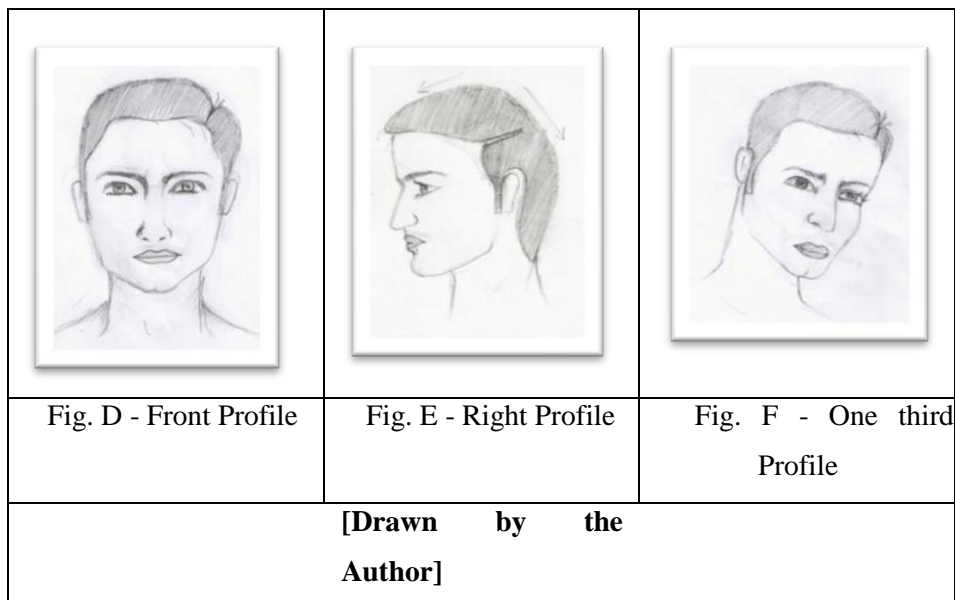
Activity 1

- Download a reference image similar to the Above File from “Google” through Internet OR use the three files Fig. A, B & C by taking a photo in your Smartphone and transfer it to your PC.
- Import the file in Krita and Trace using the technique as shown above.
- Save the file in Krita format and PNG format.

Face


Face is the area where we look for the most amounts of details to recognize a person. While drawing a character the artist draws the profile of the character in front view, left view or right view and a one third perspective view.

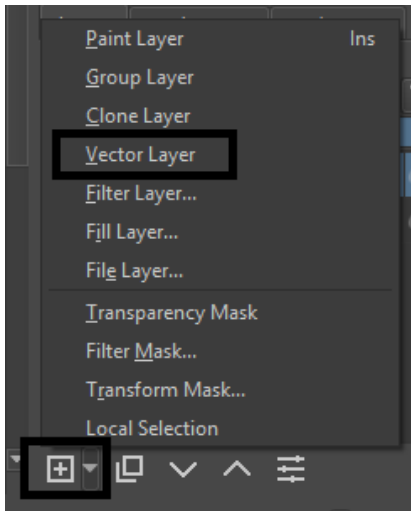
A sample of a face profile is shown in Figure D, E & F.








Practical – Technique 3 – Stroke Path using Brush

- Take a Photograph of Figure D, E & F as shown using any Smartphone.
- Transfer the photos to your PC

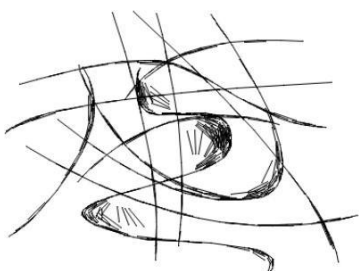
- Open Krita
- Open the Photo of Figure A
- Select Menu – Select All
- Edit Menu – Copy
- File - New [Choose any size]
- Edit – Paste
-  Transform the Photo and resize according to the screen.
- New Vector layer



- Choose Brush Tool  - Brush Settings -  - Choose a Round Brush
- Choose Bezier Curve Tool - 
- Click and draw the outline shape – Press Enter
- Continue the above process till completion.
- Choose Brush Tool  - Brush Settings -  - Choose a Designed Hazy Brush.



- Set the Brush Size as required.
- Select the vector layer.
- Edit Menu – Stroke Selected Shapes



[Screenshot]

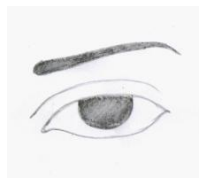



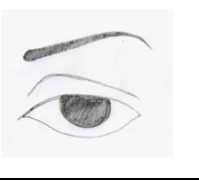

- The output will look as above. We can create sketch type of drawing using this process.

Activity 2

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita and PNG format.

Eyes

Eyes are one of our important parts to portray our expressions. Hence drawing eyes is a vital part of character design. In the given figure below are illustrated some of the eyes with their properties.

		
Fig. G -Almond Shaped Eyes	Fig. H Hooded Eyes	Fig. I – Deep-Set Eyes
		
Fig. J- Round Eyes	Fig. K - Sleepy Eyes	Fig. L - Down turned Eyes

[Drawn by the Author]

Activity 3

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita and PNG format.

Eye Colour

When it comes to the digital world, eyes come in all colours as compared to our natural eyes. The natural colour of an eye is black, blue or brown. There are rarely some shades of green. The side portions of eye ball come in white colour shades with stains of brow, yellow and red.

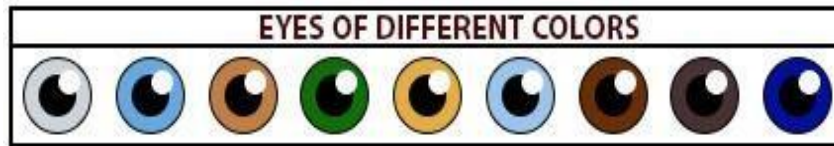

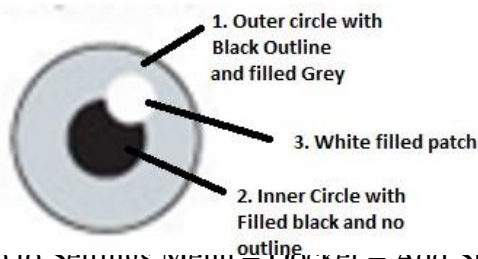


Fig M: Eyes of Different Colors [Created by the Author]

Practical – Technique 5 – Readymade vector shapes with filled colours.

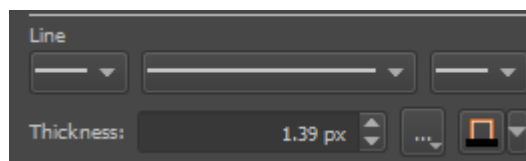
- Take a Photograph of Figure M as shown using any Smartphone.
- Transfer the photos to your PC
- Open Krita
- Open the Photo of Figure A
- Select Menu – Select All
- Edit Menu – Copy
- File - New [Choose any size]
- Edit – Paste
-  Transform the Photo and resize according to the screen.
- Now we will create the design according to a plan as shown below.



- Go to SETTINGS MENU – DOCKER – ADD SHAPE
- Select the circle shape – Click and drag onto screen
- Go to Tool Options – Choose the fill and change the colour as required.



- Set the line style and outline width as required.



- In the above process create the other two circles and place it as shown in the reference image.
- The output should be as follows:



[Screenshot]

- We can change the colours as required anytime by selecting the shaping and going to the Tool Options as shown above.

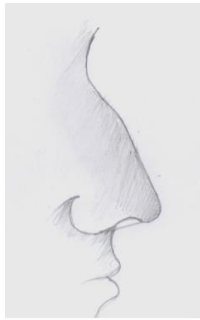

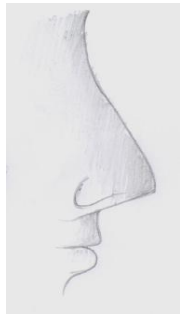
Activity 4



- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Nose

A Nose defines the look of a person. Whenever we draw an imaginary character, the look of the nose is important and forms an eye catching element in the face. People of various countries have different types of noses and while drawing a character, the artist has to experiment with different types of noses which suit the character.

Some examples of different types of noses are given below with figures.

		
HOOKED NOSE	DROOPY NOSE	AQUILINE NOSE

	
ROMAN	GRECIAN

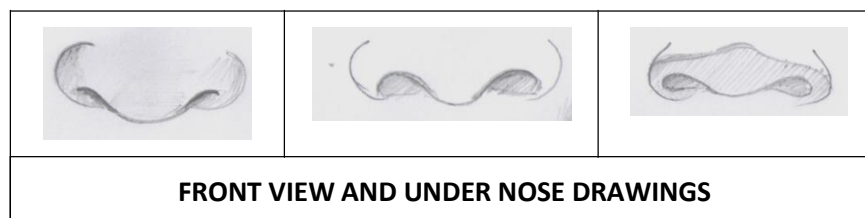
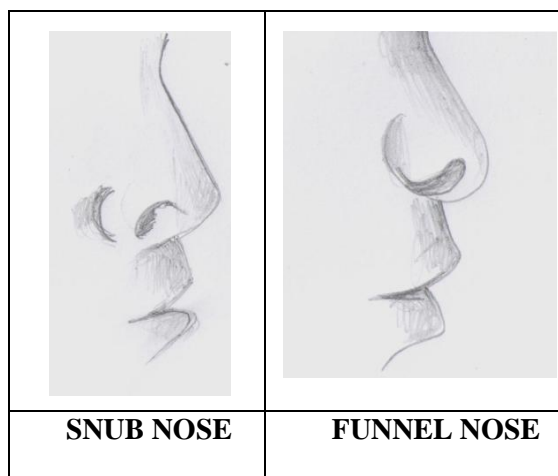
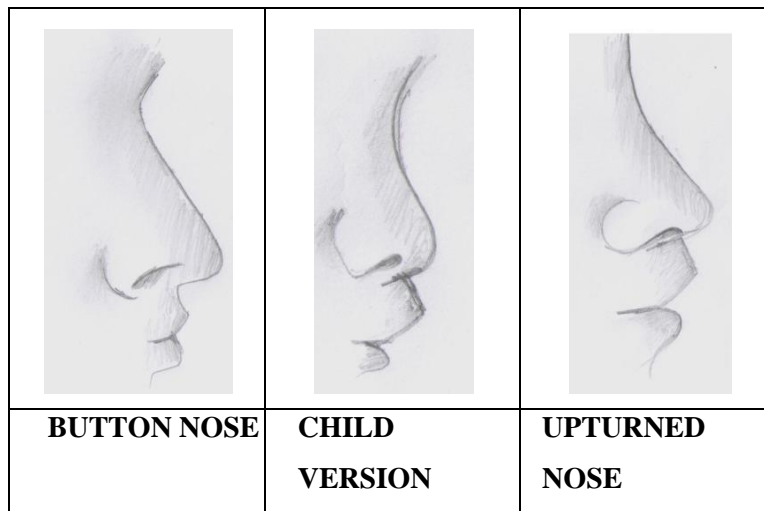


Figure N: Different Drawings of Nose [Drawn by the Author]

Activity 5

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Lips

Lips come in various shapes and sizes. But an overall look will display that all the lips are mostly same. But there is a difference when it comes to drawing lips of a character. The expression of a face is portrayed by the change in shape of the lips like smiling, laughing, sad etc.

Even lips vary from children, young person and old person. The lip of a same person

changes in texture as the age goes by. Hence, the designer or character artist should have knowledge of lips to draw a successful and appealing character.

Here are some examples of the lips with its title characteristics.









			
Natural	Pointy Natural	Thin	Cupid's Bow
			
Uni-lip	Beestung	Smear	Glamour

Figure O: Different Drawings of Lips [Drawn by the Author]





Activity 6



- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Ear

Ears are still identities in human beings. They come in few categories. As a designer, it is used to attach some decorative elements like ear rings to generate appeal.

Here are some of the examples of ears with their characteristics.

			
Round Ear Free Lobe	Square Ear	Pointed Ear	Narrow Ear
			

			
Sticking Out	Attached Lobe	Broad Lobe	

F
Figure P: Different types of Ears [Drawn by the Author]

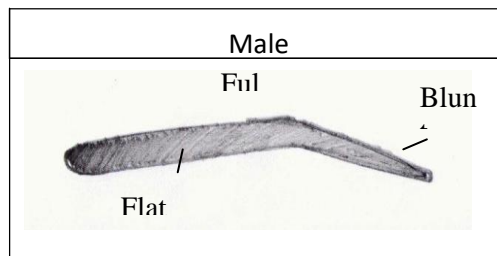
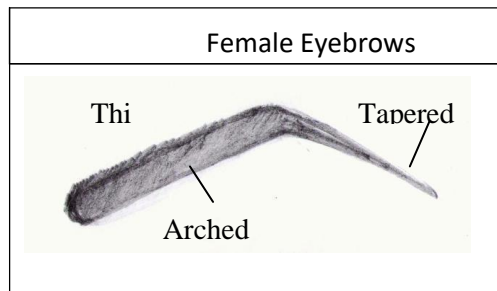
Activity 7

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.















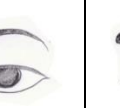
Eyebrows

Eyebrows vary from male to female. The eyebrows of male are rough and natural. The eyebrows of female are polished and thinner. There are two factors which established the shape of eyebrows- one is the overall basic shape and the other is the height of the arch.

Some of the examples of male and female eyebrows are as follows:



Female

Basic Shape					
Arch	Curved	Angled	Soft Angled	Rounded	Flat
Low					
High					

Male







Basic Shape			
Arch	Angled	Rounded	Flat
Low			

Figure Q: Different types of Eyebrows [Drawn by the Author]

Activity 8

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Hairline

Hairline is the overall outline of a face. It varies from children, male and female and it varies as per age also. Some hairlines are round; some are square and are in different proportions also.

Some of examples of male and female hairlines are given below.

Female Hairline



Straight	Rounded	Widow's Peak
-----------------	----------------	---------------------

Male Hairline



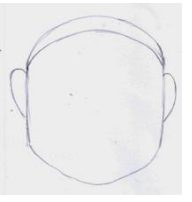
		
Regular	Receding	Receding

Figure R: Different types of Head Shapes [Drawn by the Author]

Activity 9

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

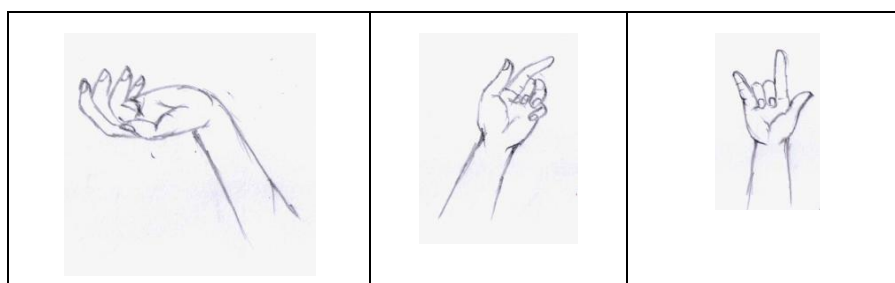
Hands

Hands consist of three joints and five fingers. The fingers again have their own joint bones. Hence, drawing a hand in different angles perfectly is very difficult. An artist has to do lots of practice to draw the poses of the hand.

Hand specifies the work which a human being does. By looking at the drawing of hands people can visualize what a person is doing. Maintaining proportions and perspective is a challenge while drawing a hand. It has to sync with the other body part pose also.

Drawing hands digitally has to go through lots of gridlines, guides and references. Hence, the base drawing is drawn on paper first with lots of shade lines and corrections. After getting the final pose of hand, it is scanned into computer and the perfect fine lines are digitized using software tools to create the neat and clean output.

Some of the poses of hands are illustrated below.



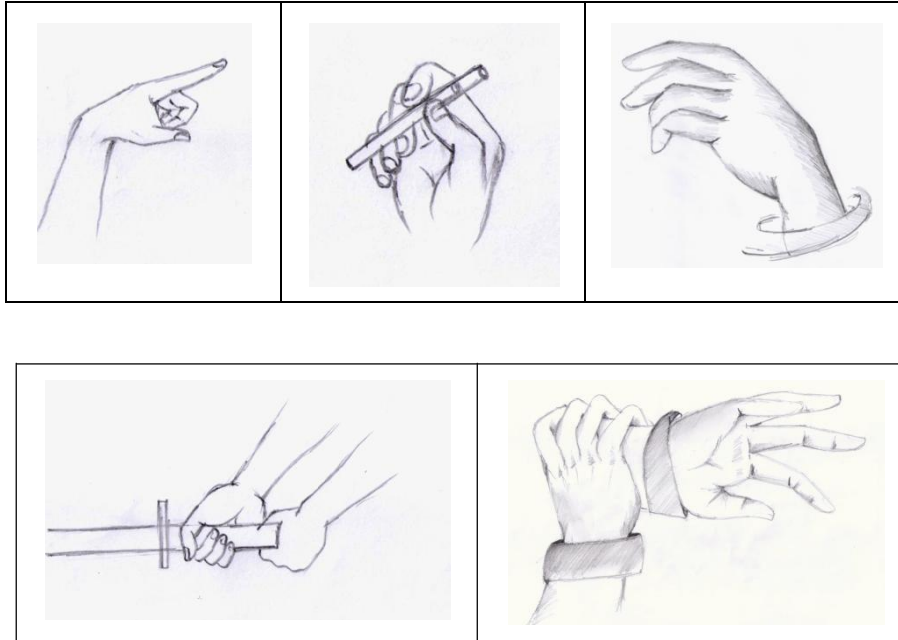


Figure S: Different types of Hand pose [Drawn by the Author]

Activity 10

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Reading

- Go through the following website for details of hand design:
- <https://design.tutsplus.com/tutorials/human-anatomy-fundamentals-how-to-draw-hands-cms-21440>

Legs

Legs are the base on which a body stands. Like hands, legs also have three joints and five toes. As the toes of the legs are small it is quite easy to draw legs as compared to hands.

The motion drawings of legs indicate whether is the person is still, walking, jogging or running. In 2D, drawings have to be done in each and every pose as required. If we want to show a man running from top view and then in a perspective view, we have to totally redraw the two drawings.

There are lots of poses related to legs, which has to be first drawn manually and then transferred to computer to create the digital output.

Some of the poses of legs are demonstrated below:

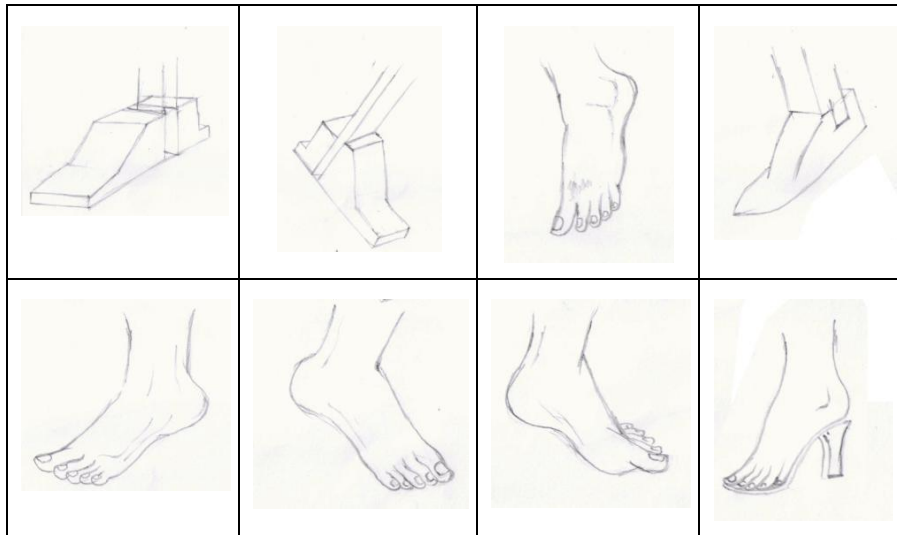


Figure T: Different types of Leg pose [Drawn by the Author]

Activity 11

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Complete Character Design

After learning the individual parts of character design, now we are in a position to create a complete character and create the vector colourful output.

First, a conceptual art work is done by the artist, which consists of lots of pencil shades. The artwork is seen by the client and finalized. Once the manual work is finalized, it goes to the Digital department.

The artwork is scanned in high resolution and set as background in digital image processing software. The digital artist redraws the fine lines from the sketch. Then he colours it and the final output is reviewed for colour changes and shape modifications if an. After the final changes the output is generated.

Some examples of character designs are as follows:





Conceptual Art

Conceptual Art Design [Drawn by the Author]

Activity 12

- Download a reference image similar to the Above File from “Google” through Internet
- Import the file in Krita and Trace.
- Save the file in Krita format and PNG format.

Different formats of output

KRITA FORMAT

*.KRA – It is the format of output of the files created using Krita Software. This format consists of all the layers details of the work and can be opened in KRITA software only.

INKSCAPE FORMAT

*.SVG- Inkscape SVG if the format of the files created using Inkscape software. This format consists of all the vector shapes of the work and can be opened in INKSCAPE software only.

PNG FORMAT

PNG stands for Portable Network Graphics. This format is popularly used due to its transparency maintenance in the edges of an image. Basically, in Logos and individual drawings or photographs the base file is required to be transparent around in edges so that it can easily merge with the background. In most of the other formats, the shape in four corners is white. The artist has to manually remove the border edges and then use the image. Hence, PNG format being transparent on its own while saving the file eases the work of the designer.



PNG Format



JPG Format

Title: Vector Design Attribution: Source: Freepngimg

Link: <http://www.freepngimg.com/png/18676-vector-high-quality-png>

Here is an example of same image with JPG format and PNG format. In JPG format, we can notice white colour patch in the edges. When we copy and paste it anywhere, it will be accompanied by the white edges.

But in PNG format the edges are transparent. It is displayed as Grey and White grid. When we copy and paste it into other image, it will automatically merge without any corner or white patch.

TGA FORMAT

TGA stands for “Truevision Graphics Adapter”. It can contain images up to 32 bits per pixel. TGA format is mostly used for still video editing sources. The edges are also transparent in TGA format.

In comparison to PNG, TGA format does not give thumbnail previews, but PNG format gives thumbnail previews. For this reason, people now-a-days use mostly PNG format as compared to TGA format.

TIFF FORMAT

TIFF stands for Tagged Image File Format. It has got the capability to store the files in form of layers. This helps the artist to edit the files in future if required. The file size of TIFF is a bit higher than other formats. But still people prefer TIFF when it comes to quality or re-editing of the design.

TIFF stores both raster and vector graphics data which helps the designer in saving the

file for making changes in the future.

JPG FORMAT

JPG is the final compressed file which for display purpose. The Pixel data is squeezed and saved as per the necessity. The use varies from usage of image in webpage, usage of the image for print purpose etc.

The designer has to fix the pixel size before saving in this format. Once the file is saved in a fixed size, it will get distorted if expanded beyond its 100% capacity. However, the memory and file size consumed by this format is very less as compared to other formats.

JPG files can be opened by most of image editing software's, from Microsoft Paint to Adobe Photoshop.

Unit Summary

In this Unit you have studied about Character Design. You have learnt the process of creating a vector output from raster drawings of various parts of our body. This Unit also described about various techniques using open source software's like Krita and Inkscape for creating the Digital version of the character which was drawn by us by our hands.

Assessment

- Describe the adjustment point of a line drawn using Pen tool called in Inkscape?
- Which format should be used for export so that the background transparency is maintained?
- Write the two commands which should be used for copying an object and pasting in the same place?

Assignment

- Create a hand drawing of a complete character.
- Scan or Take the photograph of the character.
- Create a Raster black outline work of the character in Krita.
- Create a Vector colourful output of the character in Inkscape.
- Save the output of all files created in this unit in PNG format and submit all the supporting files i.e., Krita file, Inkscape file, rough character photo and output files in a CD/DVD to the University.

Resources

- Illustrating a Character in Krita:
<https://www.youtube.com/watch?v=edJJTemV4pY>
- 2D Character Design in Krita:

https://www.youtube.com/watch?v=ZYwICk_XbMg

- 2D Character in Colour

<https://www.youtube.com/watch?v=3xsyoTqcwRA>

- Colouring in Krita

<https://www.youtube.com/watch?v=low1odYyuWo>

Unit 3 Practical- Create Texture tricks with Inkscape

Introduction

Texture is the about creating the surface quality or feel of an object. The way your skin surpasses against the rough fabric of your woollen blanket, the warm sensation of the soapy bubbles over your skin in the bath or the gentle touch of your hair falling down your shoulders — these are all sensations and experiences created solely by the qualities of texture. In the olden days, textures were only photographed and utilized in the designs. But with the help of latest software's like Inkscape, Photoshop, Coreldraw etc. You have the freedom to create the texture of your own settings. Artificial textures, or abstract textures, comprise a wide array of imagery with surrealistic patterns and human- fabricated objects. Artificial texture graphics include a broad spectrum of elements and colours created by three-dimensional design and a blend of computer graphic software's. By using the power of modern 3D and Graphic Design software, designers can add a broad range of artificial textures to their designs, and the results are limited only by imagination.

Outcomes

Upon completion of this unit you will be able to:

- *Develop* an idea of creating Textures.
- *Practice* the software – Inkscape for creating Textures.
- *Use* the created textures for creating design works.
- *Prepare* a practical study of all the texture options available in Inkscape.
- *Create* some examples of combined texture effects.

Terminology

Texture: A realistic effect of an object or colour with adds depth to the visual.

Vector: The shapes used by software's which are not distorted while enlargement as well as consumes only less space.

Blog: Photographs or images made up of pixels or dots which represent the information of position as well as the colour of the pixel. It consumes more space as compared to Vector based shapes.

Typography: The style of writing an alphabet written manually.

Font: The style of using the digital alphabets using Computers or any digital platform.

Tips and Notes

Before starting of the practical, there are few things which you should know and for which you should be prepared.

- You should know about the meaning of various types of textures. For doing so you have to go to Internet and search various texture photographs.
- You should keep a collection of textures for reference purpose so that you can use them wherever required.

Group Activity

- Go to “google.co.in”.
- Click on the “Images”
- Search for texture design i.e., wood texture, tiles, grass texture, marble texture, fabric texture etc.
- Create a Folder named “texture” in your PC or your pen drive.
- Save as many variety of textures you feel as of good quality.
- Now copy all the textures downloaded from internet by all the students in this particular batch.
- You will notice that you have collected a huge collection which will be useful for all in creating future designs.
- Apply this method for other purposeful searches also. This will create a variety of output and will be multi beneficial to everyone.

Texture Design – Requirement of Industry standard

The designs which we create today needs to be filled by Textured Graphics and abstract backgrounds which gives truly immersive feel of the design. For getting the depth and detail in our work we have to create textures using the tools and techniques available in the digital industry. Softwares give us options like opacity, blending modes like add, overlay, multiply etc. which enables us to create a look of three dimension in the two dimension layout. Typography is an important element in texture which adds meaning to the background to transfer communicative messages. Different styles of typography which are called fonts in the computer terminology comes in thousands. Modern designers use all sorts of fonts which range from calligraphically styled icons to simple and modern typed text. By utilising the mixture of style, shape and texture, a written font creates a statement of power without the input of complex composition of designs.

The technical world has gone beyond expectations and limitation to creating a stunning visual outputs in our designs.

Texture became applicable in design decades ago when people use to draw line drawings on walls which we can see in ancient places. There were no particular medium like pen, paper, canvas or digital screens at that time. People use to communicate on leafs, rocks and

wherever they could using their knowledge and creativity. Hence forth, texture has become a compulsory part of the design. The use of texture is found in each and every medium of today, whether it may be a flyer or a hoarding on the road. The background is given an effect of a texture of any resource which creates depth to the presentation.

Texture does not only mean rough surface, there are varieties of tiles surfaces which form of a geometric design. A different type of textures generates different kinds of feeling in us. So textures are used according to the place and requirement. For example, if we are making a design of a bathroom, then the floor are made up of glazing tiles. The half of the walls is covered up of glazing tiles. These tiles do not soak water; hence these tiles are used in this place.

Textures are basically random in nature. No two textures can resemble accurately the same. As we can say that no finger prints of different individuals can ever match although it seems equal from a distance. The wood texture of two different people will never match although it may look same. We will now have a look into the types of textures used in designing.

Types of Textures

There are two kinds of textures. One is Tactile Texture and the second is Visual Texture.

Tactile Texture

Tactile means the feeling of a touch. In Tactile texture, materials are used such as sand, thick colours etc. to emboss the effect and have the feeling of a raised element. For creating tactile kinds of texture, we have got 3D printing technology. 3D printing technology has enabled us to create designs and effects which can be printed on raised platforms like thermocol design printing, printing on wooden pens etc. We can print a complete science project using a 3D printer showing various parts of the area in three dimensions.

Visual Texture

Where as in Visual Texture, it is representation of colours used which create a 3d raised effect on a flat surface. It is the illusion created by the artist by his colour combination techniques that makes a two dimensional work to look three dimensional. Texture is a subtle element in design. It makes the design more attractive. Although they are not real, it depends upon the talent of the artist to represent a visual texture with a raised feeling.

Inkscape – Open Source Software for Design and Texturing

Inkscape is one of the free professional quality vector graphics software which runs on Windows, Mac OS X and GNU/Linux. It is used by design professionals and hobbyists worldwide, for creating a wide variety of graphics such as illustrations, icons, logos, diagrams, maps and web graphics. The W3C open standard i.e. SVG (Scalable Vector Graphics) is used

by Inkscape. This format is the native format of Inkscape which is vector based and can be exported and compatible with other vector based software's.

Inkscape has got tools and techniques that can create outputs which are comparative to Adobe Illustrator, CorelDRAW and Xara Xtreme. Several other formats can also be exported and imported using Inkscape, which includes SVG, AI, EPS, PDF, PS and PNG. Inkscape has a comprehensive set of features, with a simplified interface, multi-lingual support and is extensible in design; users can extend the functionality of Inkscape functionality with add-ons which can be provided by any open source software developer.

The availability of this kind of open source software's have enabled artists to come forward and display their creations to the open world. The world is expanding day by day. The concept of getting quality product only by a paid program has faded away. Products like Facebook, Whatsapp, G-mail are totally free to use. No one can even question about the quality of the product or service. They are world class but still they are free. The generation of open source software has opened doors for best talents all over the world. It is the work which is appreciated, not the source of making the work. No one bothers about the bat of Sachin Tendulkar, it is the runs scored which matters. Hence, before using free open source software, the artist should not think himself of inferior to paid software's. It is the difference of comfort of use only, rather than the quality. If we travel in a General compartment, or a Sleeper Compartment, or an AC compartment of a train, all the three reach the same destination.

Open source software's have some limitation in advanced tools and techniques, the time taken to create a master piece using open source software will take a little more time for the artist, but the destination i.e. quality of the output will be at par with paid software's if the artist is talented. So it is your talent which will help you in creating a fine quality output.

Note It

You have already studied the software Inkscape in Block 3 –

Image Development on different Graphic Software, Unit 2 - Familiarization with interface of Inkscape.

Hence, we will only focus on the tools required for texture designing.

Study Skills

Texture designing has become a trend for the designers by using the filter capabilities of software. Lots of textures from realistic to abstract can be done using software's. In the olden days texture creation was limited to professional learning hand drawn artists and painters only.

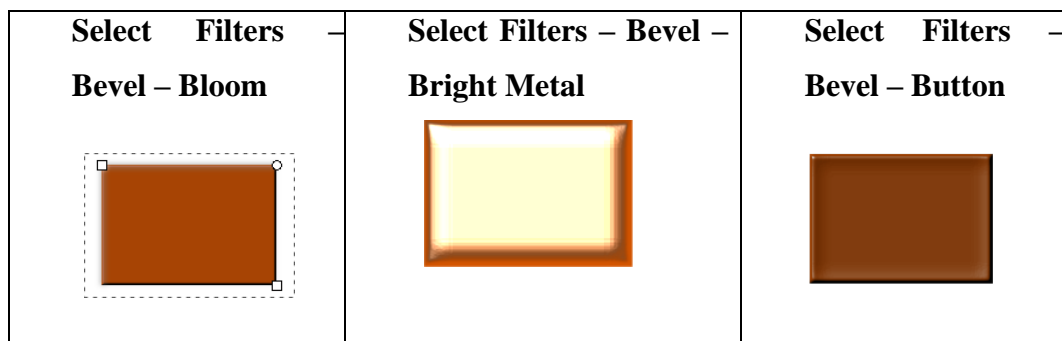
But henceforth for creating texture, you do not require a hand drawn skill only. It is about the blend of your creativity and knowledge of software operations which will create a colourful and attractive texture.

Create Base Texture using in-built Inkscape Options

Textures are categorically arranged in Inkscape. The filters which creates the effect of a texture are actually codes or programs written by a programmer studying the details of a texture. Each colour has got its depth coordinates which begin from brighter part to the darker part i.e. White to Black. In- between white to black, there are grey shade available. These shades are applied as base coordinates to the colour or image on the screen to create the texture kind of effect. Before creating a meaningful texture, we will go through the process of creating a texture. First of all, we will have a study of all the inbuilt texture options of Inkscape software. There are around hundreds of ready-made texture filters in Inkscape. We will go through it one by one as mentioned in the table below.

Practical:

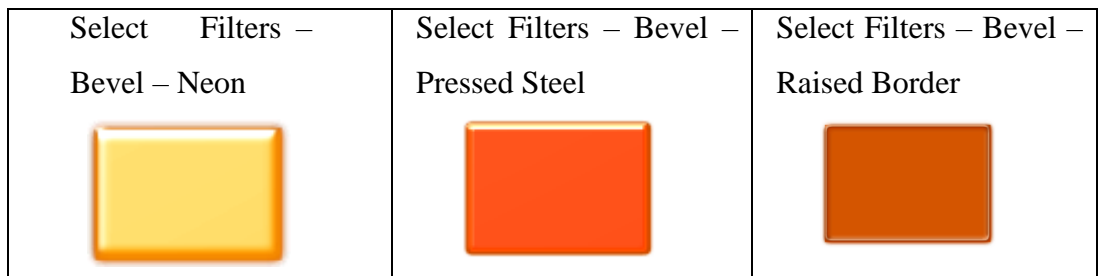
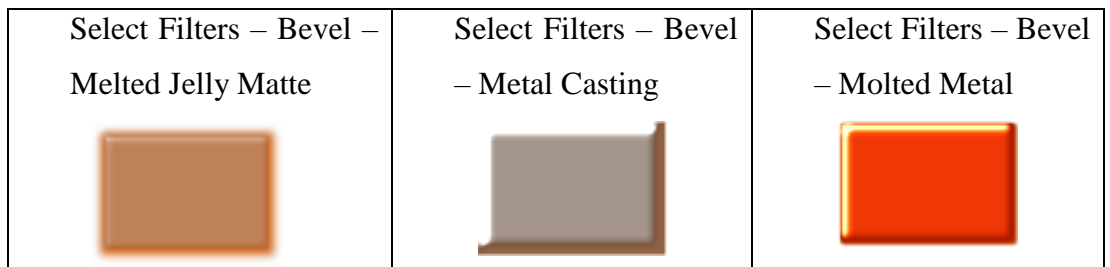
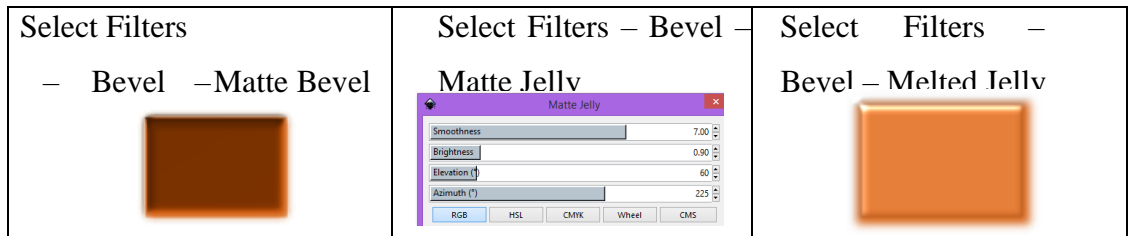
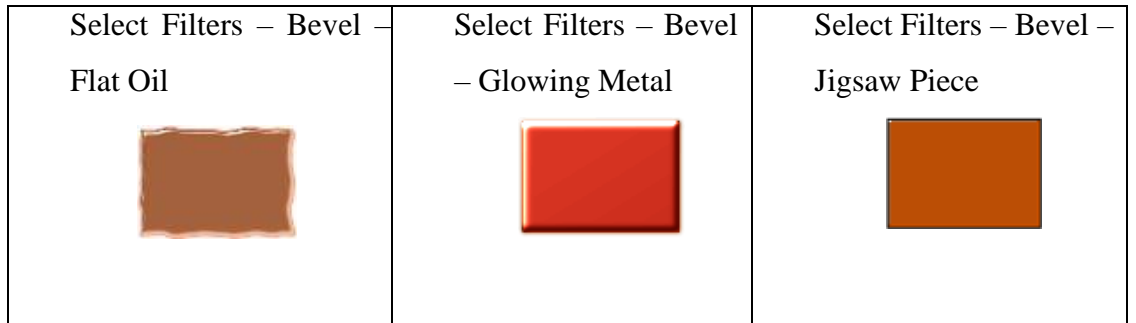
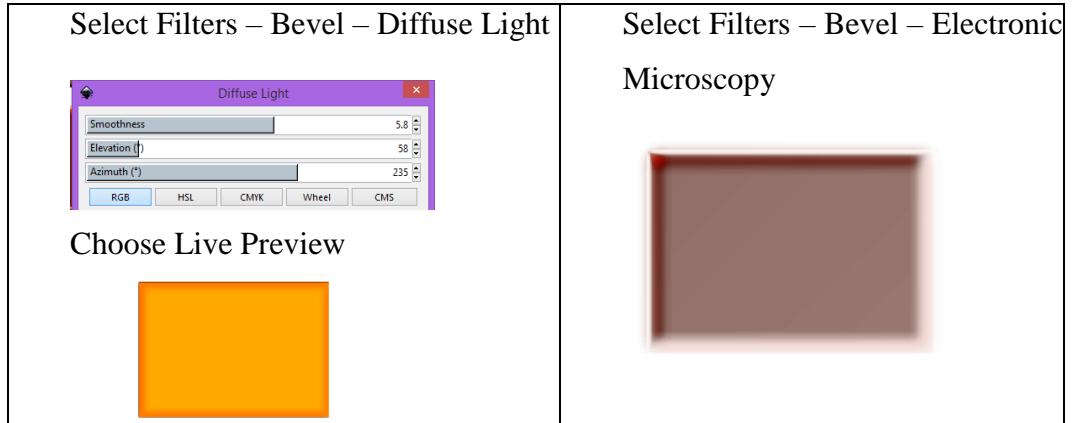
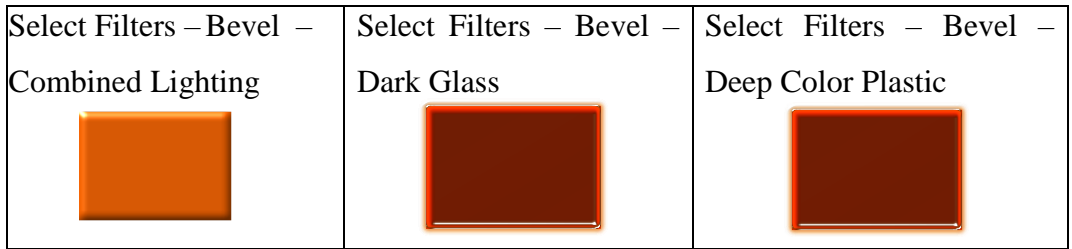
- Open Inkscape Software
- Create a rectangle
- Apply any colour
- Select the Rectangle
- Create around 10 copies of the Rectangle in the same page.
- Select One Rectangle

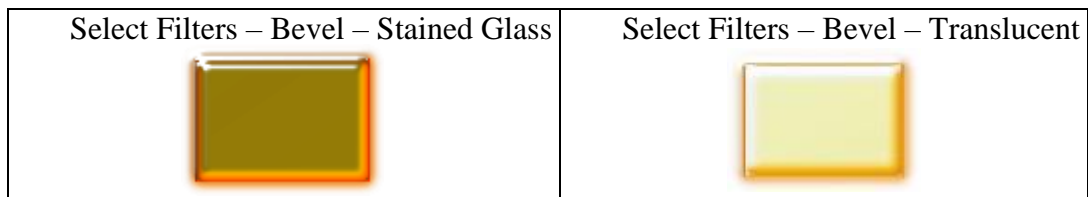
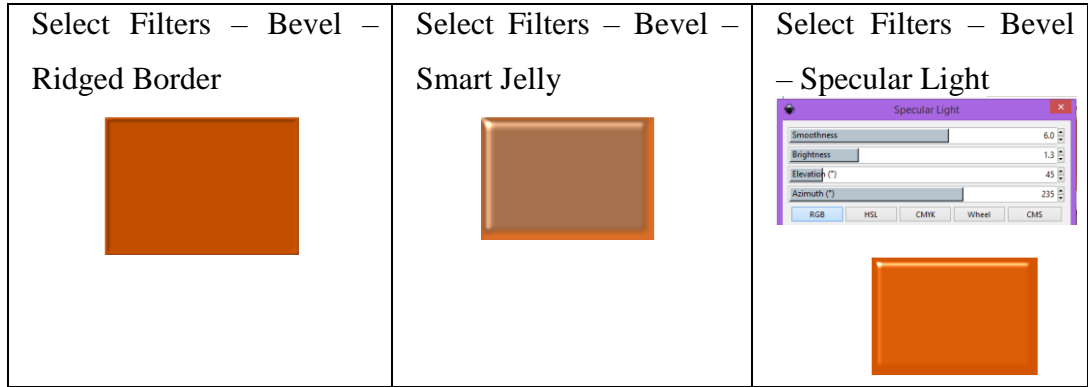


[Screenshot]

Note It

- Please do not neglect this activity as simple.
- Practice each and every filter from beginning to end one by one without missing any of it.
- This kind of practice is very important for becoming an expert in any subject.
- Texture output will vary from colour to colour and image to image. For i.e. a texture applied to a dark shade of colour will be more appropriate than applying the texture to a light shade and vice versa.





Below Mentioned are the list of all the Filter effects. Practice the effects one by one and put a tick mark after visualising the effect in the rectangle on the computer screen. Save the final jpg file of all the effects for future reference.

<ul style="list-style-type: none"> • Select Filters – Blurs- • Apparition • Blur Double • Blur • Clean Edges • Cross Blur 	<ul style="list-style-type: none"> • Select Filters – • Bumps • Basic Diffuse • Bump • Basic 	<ul style="list-style-type: none"> • Canvas Bumps Alpha • Canvas Bumps Matte • Convoluted Bump • Dark Emboss
<ul style="list-style-type: none"> • Evanescent • Feather • Out of Focus 	<ul style="list-style-type: none"> • Specular Bump • Basic Two Light • Bumps • Bubbly Bumps • Bubbly Bumps Alpha • Bubbly Bumps Matte • Bump Engraving • Bump • Canvas Bumps 	<ul style="list-style-type: none"> • Embossed • Leather • HSL Bumps Alpha • Jelly Bum • Linen Canvas • Paper Bump

Select Filters – Bumps- <ul style="list-style-type: none"> • Plaster • Plaster Color • Plasticine • Plastify • Relief Print 	<ul style="list-style-type: none"> • Rough Canvas Painting • Thick Acrylic • Thick Paint • Tinfoil • Velvet Bumps • Wax Bump • Wrinkled Varnish
--	--

<ul style="list-style-type: none"> • Select Filters – Color- • Black Light • Blend Opposites • Brilliance • Channel Painting • Color Shift • Colorize • Component Transfer • Duochrome 	<ul style="list-style-type: none"> • Extract Channel • Fade to Black or White • Fluroscence • Greyscale • Hue to White • Invert • Lighting • Lightness- Contrast • Nudge CMY 	<ul style="list-style-type: none"> • Nudge RGB • Paint Channels • Quadritone fantasy • Simulate CMY • Soft Colors • Solarize • Trichrome • Tritone
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<ul style="list-style-type: none"> • Select Filters – Distort • Chalk and Sponge • Felt Feather • Lapping 	<ul style="list-style-type: none"> • Pixel Smear • Ripple • Rough and Dilate • Roughen Inside 	<ul style="list-style-type: none"> • Roughen • Swril • Torn Edges
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<ul style="list-style-type: none"> • Select Filters – Fill and Transparency - • Blend • Channel Transparency • Fill Background • Flatten Transparency 	<ul style="list-style-type: none"> • Light Eraser • Monochrome Transparency • Opacity • Posterized Light Eraser 	<ul style="list-style-type: none"> • Saturation Map • Silhouette
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<ul style="list-style-type: none"> • Select Filters – Image Effects - • Age • Edge Detect 	<ul style="list-style-type: none"> • Film Grain • Sharpen 	<ul style="list-style-type: none"> • Sharpen More • Soft Focus Lens
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<ul style="list-style-type: none"> • Select Filters – Image Paint and Draw - 	<ul style="list-style-type: none"> • Cross Noise Poster B • Drawing 	<ul style="list-style-type: none"> • Old Postcard • Pencil • Point Engraving
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<ul style="list-style-type: none"> • Alpha Draw Liquid • Alpha Engraving • Alpha Engraving B • Blueprint • Chromolitho Alternate • Chromolitho • Cross Engraving • Cross Noise Poster 	<ul style="list-style-type: none"> • Electrize • Image Drawing Basic • Light Contour • Liquid Drawing • Litho • Marbled Ink • Neon Draw • Oil Painting 	<ul style="list-style-type: none"> • Poster ColorFun • Poster Draw • Poster Paint • Poster Rough • Posterize Basic
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<ul style="list-style-type: none"> • Select Filters – Materials - • 3D Marble • 3D Mother of Pearl • 3D Wood • Cracked Lava • Enamel Jewellery 	<ul style="list-style-type: none"> • Eroded Metal • Flex Metal • Gold Paste • Gold Splatter • Iridescent Beeswax 	<ul style="list-style-type: none"> • Leopard Fur • Lizard Skin • Metallized Paint • Peel Off
--	---	--

<ul style="list-style-type: none"> • Select Filters – Morphology - • Black Hole • Contouring discrete • Contouring table 	<ul style="list-style-type: none"> • Cool outside • Cross Smooth • Outline 	<ul style="list-style-type: none"> • Posterized Blur • Warm Inside
--	---	--

<ul style="list-style-type: none"> • Select Filters – Non Realistic 3D Shaders - • Aluminium • Aluminium Emboss • Brush Draw • Brushed Metal • Chrome • Chrome Emboss • Comics 	<ul style="list-style-type: none"> • Comics Cream • Comics Draft • Comics Fading • Contour Emboss • Deep Chrome • Deep Metal • Emboss Shader 	<ul style="list-style-type: none"> • Frosted Glass • Opaline • Refractive Glass • Sharp Deco • Sharp Metal
--	---	---

<ul style="list-style-type: none"> • Select Filters – Overlays - • Alpha Monochrome Cracked • Alpha Turbulent • Barbed Wire • Canvas Transparency • Carnaval • Clouds • Colorize Turbulent 	<ul style="list-style-type: none"> • Cross Noise Cross Noise B • Dots Transparency Duotone Turbulent • Frost • Garden of Delights • Growing Cells • Light Eraser Cracked • Liquid 	<ul style="list-style-type: none"> • Noise Fill Oil Slick People • Poster Turbulent Rough • Transparency Rubber Stamp Scotland • Shaken Liquid • Silhouette Marbled
--	--	--

<ul style="list-style-type: none"> • Select Filters – Pixel Tools - • Pixellize 		
---	--	--

<ul style="list-style-type: none"> • Select Filters – Protrusions- • Chewing Gum 	<ul style="list-style-type: none"> • Dripping • Fire 	<ul style="list-style-type: none"> • Ink Bleed • Snow Crest
--	--	---

<ul style="list-style-type: none"> • Select Filters – Ridges - • Dragee • Glowing Bubble 	<ul style="list-style-type: none"> • Matte Ridge • Metallized Ridge • Refractive Gel A 	<ul style="list-style-type: none"> • Refractive Gel B • Thin Membrane
---	---	---

<ul style="list-style-type: none"> • Select Filters – Scatter - • Air Spray 	<ul style="list-style-type: none"> • Cubes • Leaves 	<ul style="list-style-type: none"> • Pointillism
---	---	---

<ul style="list-style-type: none"> • Select Filters – Shadows and Glows - • Cutout • Glow 	<ul style="list-style-type: none"> • Dark and Glow • Drop Shadow • Emergence 	<ul style="list-style-type: none"> • In and Out • Inset
--	---	---

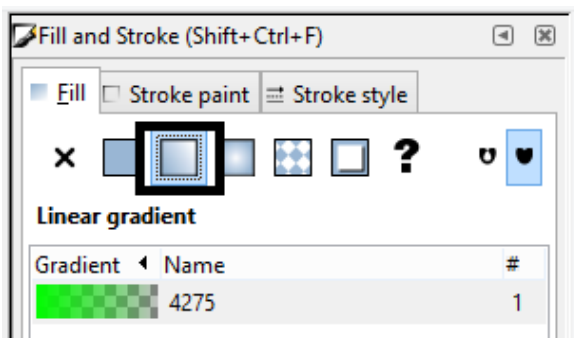
<ul style="list-style-type: none"> • Select Filters – Textures - • Bark • Blotting Paper • Burst • Cracked Glass • Crumpled Plastic • Felt • Gouache 	<ul style="list-style-type: none"> • Ink Blot • Ink Paint • Jam Spread • Melted Rainbow • Organic • Riddled • Rough and Glossy • Rough Paper 	<ul style="list-style-type: none"> • Silk Carpet • Stone Wall • Tinted Rainbow • Warped Rainbow • Water Colour • Wax Print
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Creating Textures using Combined Options of Inkscape

Apart from the base effects available in Inkscape we can create new types of effects with the combination of several vector tools and filters.

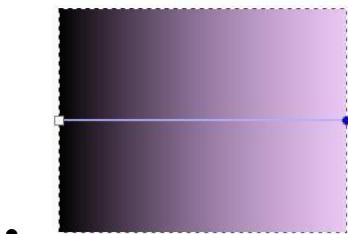
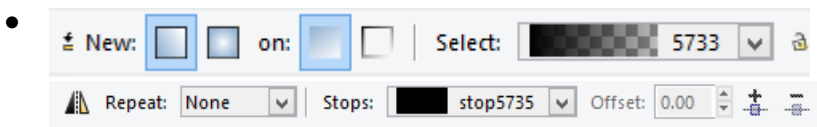
Textured Text with Background

- Open Inkscape
- Create a Rectangle
- Create a coloured Gradient in the Rectangle [Object Menu – Fill and Stroke]

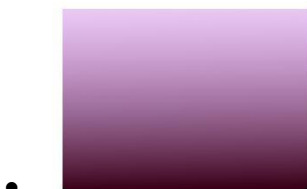


-  Gradient Tool

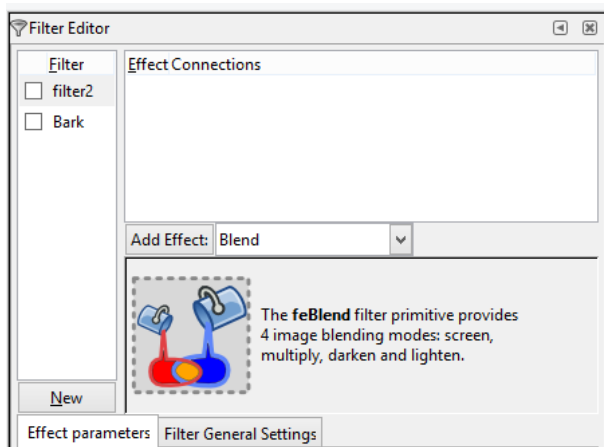
- Double Click on the subject



- Change the Angle of the Gradient



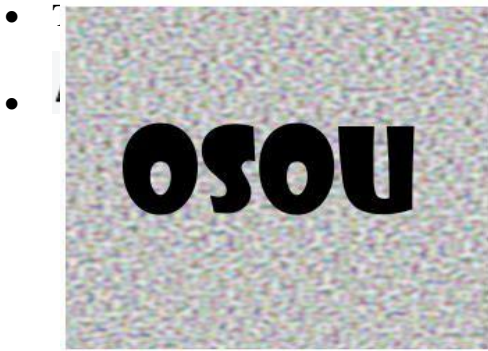
- Select the Above Rectangle
- Filter Menu – Filter Editor



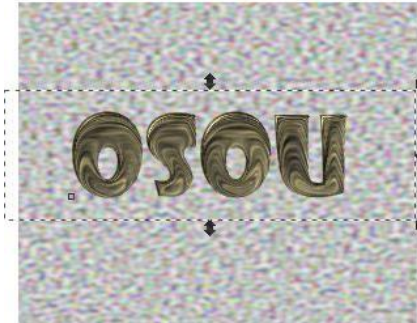
[Screenshot]

- Left Click on New
- Select the Effect from the list in the right hand side of Add Effect
- Left Click on Add Effect
- Change the Settings as Required

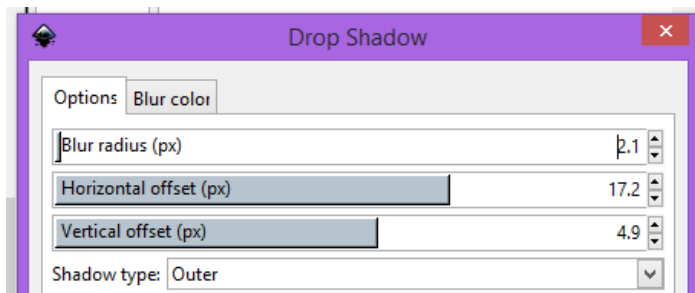




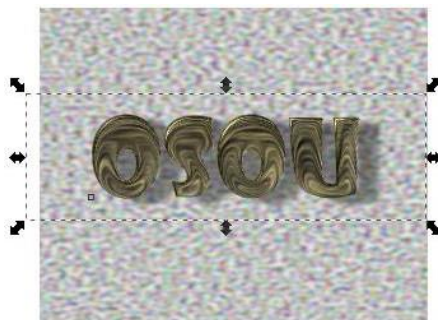
- Select the Text
- Filter Menu – Materials – 3D Wood



- Filter Menu – Shadows and Glows – Drop Shadow



- Final Output



[Screenshot]

- File – Save – Inkscape format
- File – Export – JPG format.

Activity 1

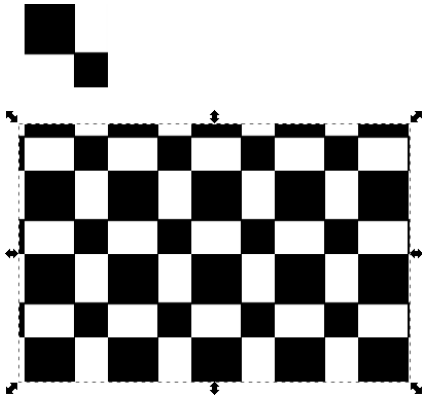
- Create a Textured Text with a Textured Background as shown in the process.
- Save the File in Inkscape Format as well as JPG format

Create a Patterned Texture in Inkscape

- Open Inkscape
- Create a Pattern Design



- Select both the shapes
- Path Menu – Combine
- Both the shapes will change to single colour.
- Select Black Colour
- Choose Stroke as None
- Object Menu – Pattern – Object to Pattern
- Create a Big Rectangle
- Object – Fill and Stroke
- Apply the Pattern in the Fill



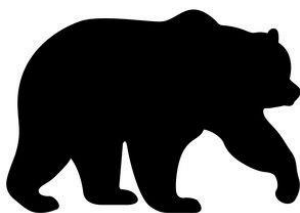
[Screenshot]

Activity 2

- Create around three Patterns as shown in the process.
- Save the File in Inkscape Format as well as JPG format

Converting a Bitmap into Tiled Clones

- Open Inkscape
- File – Import – Import an Image [Use the Images with white background and a colourful image]

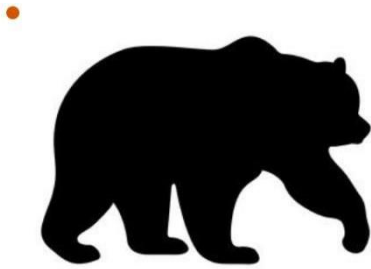


[Screenshot]

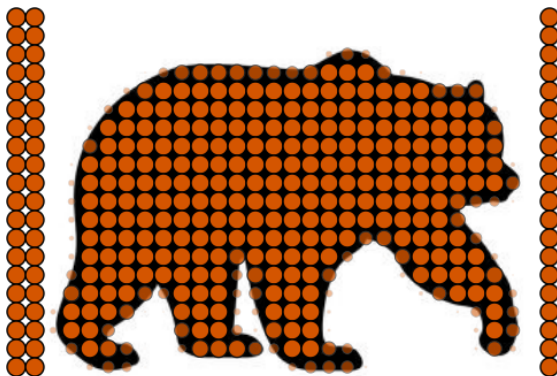
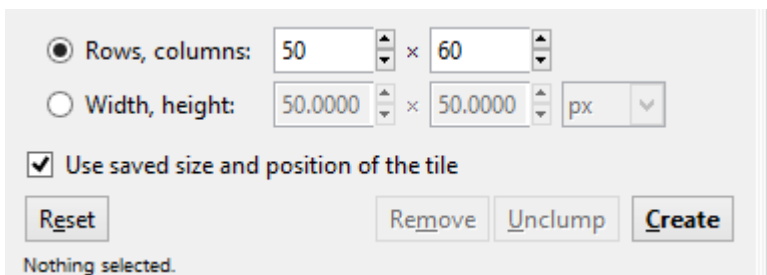
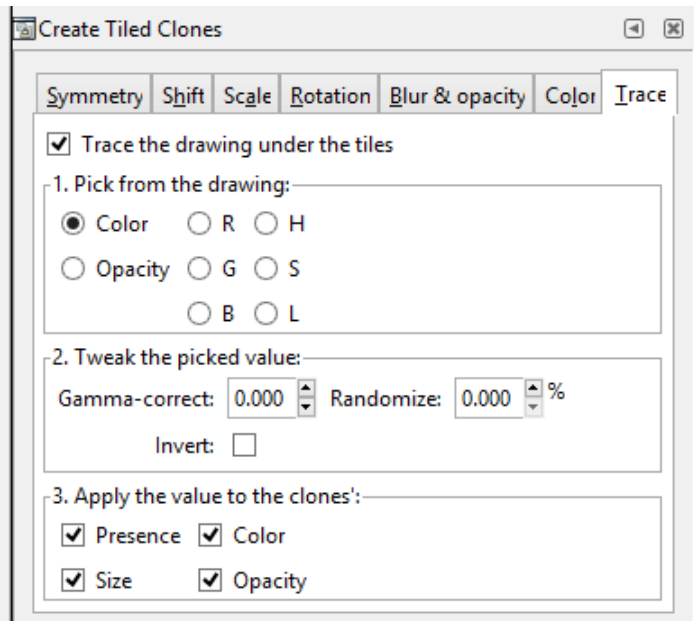
- Create a Small Circle as compared to the size of the bat [5% of the size of the bat]. Hold

Control to draw a perfect circle.

- Set the fill colour to BLACK

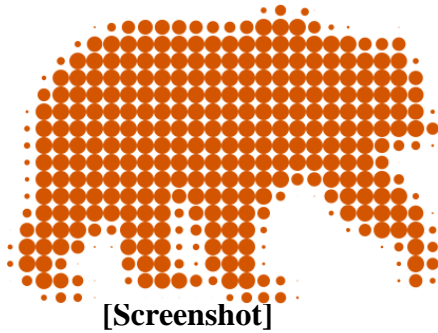


- Select the Small Circle
- Edit Clones – Create Tiled Clones
- Go to the Trace Tab and set the settings as shown.



[Screenshot]

- Delete the unwanted shapes
- Final Output




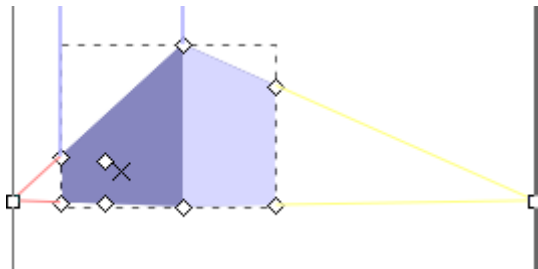
Activity 3

- Create a tiled clone of a tiger silhouette.
- Save the File in Inkscape Format as well as JPG format

Create a 3D style of texture

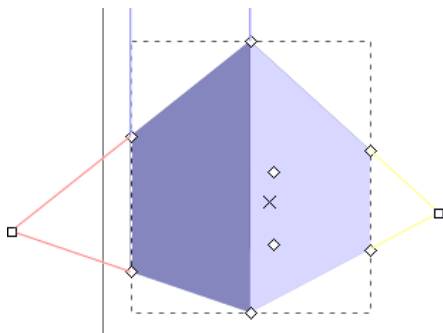
Creating a 3D style of effect in a 2d layout software has added a new arrow in the armour of a designer. Creating 3D drawing required a good knowledge of perspective drawings. A graphic designer with only a knowledge of computer graphics cannot draw as perfectly as compared to a trained artist. So the 3D tool in software is an excellent option for use.

- Open Inkscape
- Select the 3D box tool - 
- Left click and drag on screen



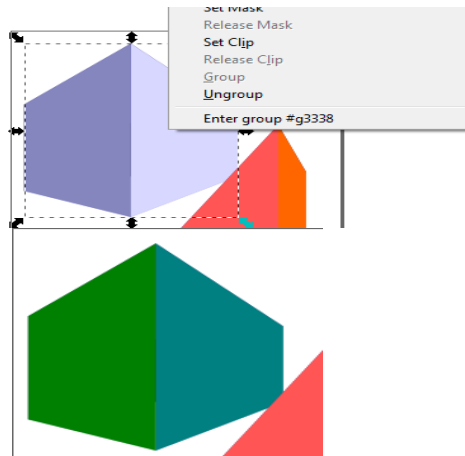
[Screenshot]

- Adjust the white points or nodes to create different camera angles.



- Create 4 to 5 different 3D boxes with different colours and create a composition.
- Select a 3D Box. Right click on the 3D Box – Left click on Enter Group.

- Select the parts of the box individually and change the colour



[Screenshot]

Activity 4

- Create around ten 3D boxes as shown in the process.
- Save the File in Inkscape Format as well as JPG format

Create a texture using combination of shapes

Various geometrical shapes can be created using the inbuilt options of Inkscape. Hand drawn designs take time and the accuracy depends on the art hand of the artist. Whereas using tools and techniques a common designer can create perfectly shaped designs.

- Open Inkscape

OPTION – A – PATH MENU - UNION

- Create shapes as shown below and colour them differently:



[Screenshot]

- Select the above shapes together
- Path Menu – Union

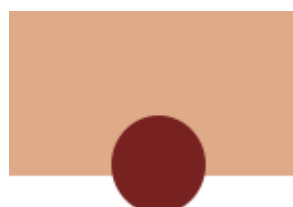


[Screenshot]

- In the final output the shapes will be combined together to form a single shape.

OPTION – B – PATH MENU - DIFFERENCE

- Create Shapes as shown below and colour them differently



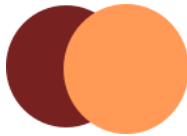
- Select the above shapes together
- Path Menu – Difference



In the final output the shape which is on the front gets subtracted from the shape which is below.

OPTION –C– PATH MENU - INTERSECTION

- Create shapes as shown below and colour them differently:



- Select the above shapes together
- Path Menu – Intersection



In the final output the intersected part of the shapes will be combined together to form a single shape removing the non- intersected areas.

OPTION – D – PATH MENU - EXCLUSION

- Create Shapes as shown below and colour them differently



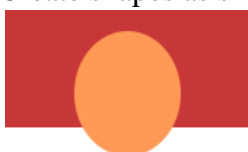
- Select the above shapes together
- Path Menu – Exclusion



In the final output the shape which is above seems to be filled with white colour. But actually it is not filled with white colour, the above shape is being cut from the shape below. If we move the shape to a different image, out of the hole we can see the image behind.

OPTION –E– PATH MENU - DIVISION

- Create shapes as shown below and colour them differently:



- Select the above shapes together

- Path Menu – Division
- Move the objects separately



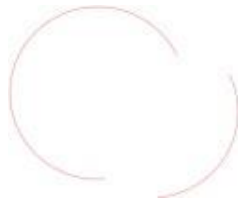
In the final output the shape above is subtracted from the shape below and vice versa. And both the subtracted shapes remain on the screen.

OPTION – F – PATH MENU – CUT PATH

- Create Shapes as shown below and colour them differently



- Select the above shapes together
- Path Menu – Cut Path
- Move the path




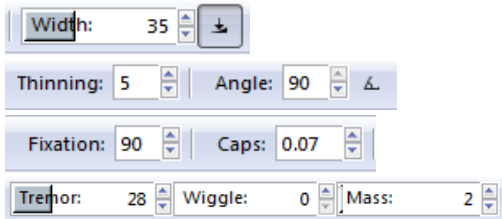
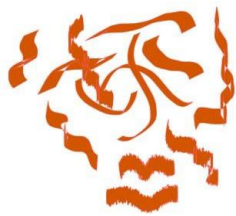
In the final output the outline shape of the path is divided along the above shape.



Activity 5

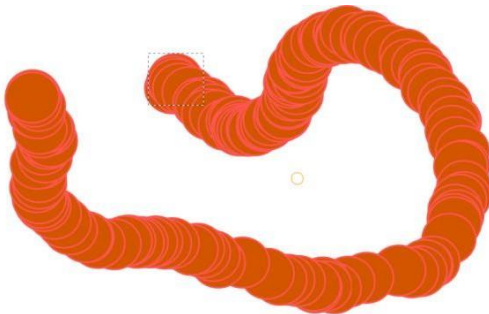
- Create three examples of Union, Difference, Intersection, Exclusion, and Division & Cut path each as shown in the process.
- Save the File in Inkscape Format as well as JPG format

Create textures with various tools

- Open Inkscape
-  Calligraphic Brush tool
- Choose the tool
- Left click and drag on screen
- Change the Tools options of the tool and draw on the screen.



-  Spray tool
- Draw any shape
- 
- Choose the Spray tool
- Left click and drag over the shape

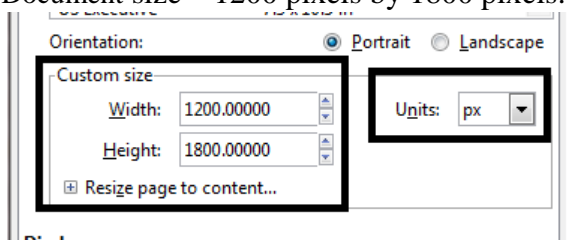


[Screenshot]

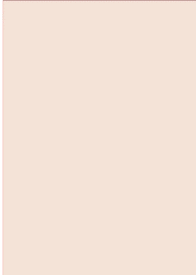
Create a digital painting texture

In this part, we will prepare a digital painting. The tools used for digital painting comprise of options required for creating various kinds of textures. The individual tools act as a combination for creating an output. Learning the tools will limit the knowledge up to options itself. Applying it in a project will enhance the capabilities of the user to know where to use them in required segments.

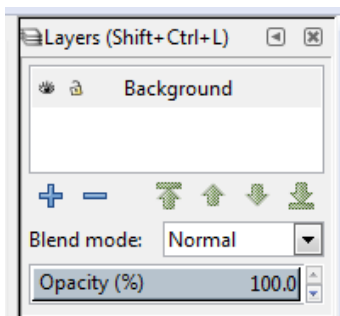
- Open Inkscape
- Create a new file in Inkscape.
- File – Document Properties
- Document size – 1200 pixels by 1800 pixels.



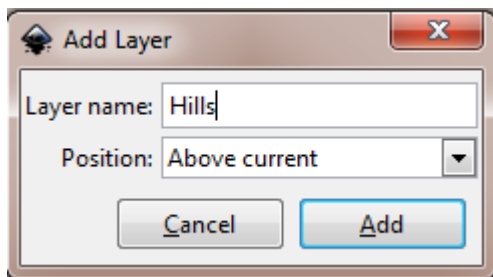
- Create a rectangle which covers the whole canvas.
- Apply a light blue colour of a sky.



- Layers Docker – Shift + Ctrl + L
- Rename the layer as Background



- Layer – Add Layer – (Shift + Ctrl + N)



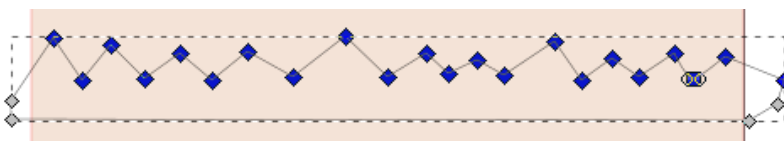
- Rename the layer to Hills
- Choose the Pen tool.
- Draw Hills as per your imagination.




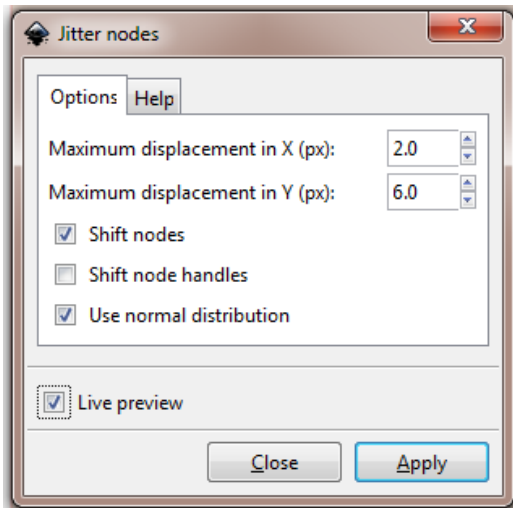
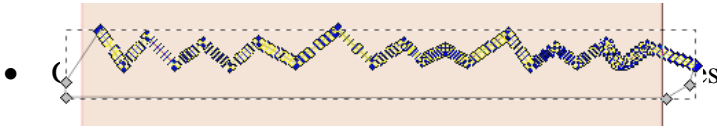
- scattered for which we have to add lots of nodes in the shapes.



- Select the Nodes tool -
- Select the top nodes



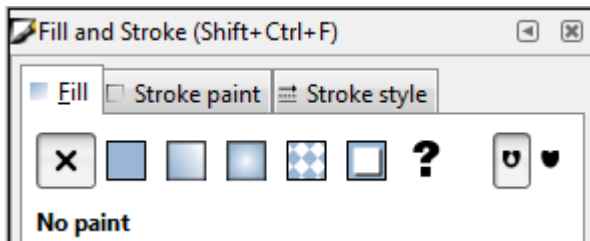
- Nodes Tool Bar – Add Nodes - 
- Left click 3 times of the Add Nodes



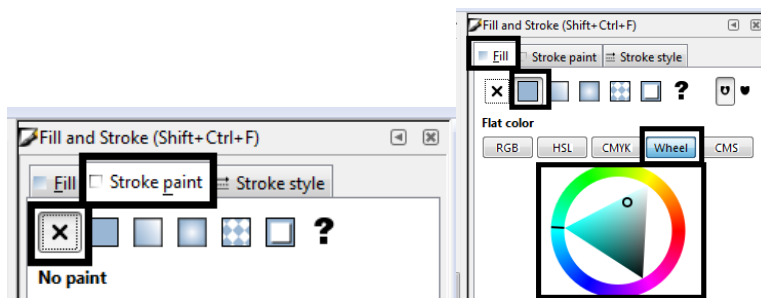
- Maximum displacement in X – 2.0 and Maximum Displacement in Y – 6.0.
- Live Preview – On – Apply



- The above shows a very detailed description of the hill shape. Now we will colour the shape.
- Press Ctrl + Shift + F to open Fill and Stroke dialog box

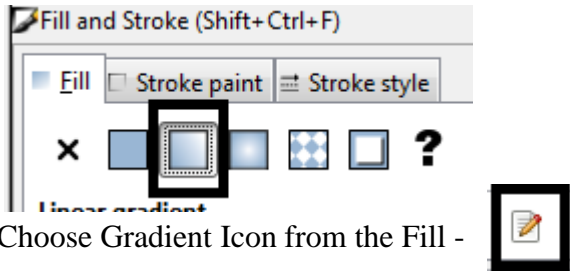


- Apply a light fill colour and remove the stroke paint.



- We will create a Gradient out of the fill colour. A gradient colour effect will add depth to the design. We have to choose and experiment with various colours to get the desired

effect. The colour combination varies from artist to artist. Hence, it is not required to use the same colours or shapes as shown above.



- Choose Gradient Icon from the Fill -
- Left click on Edit Gradient Icon -

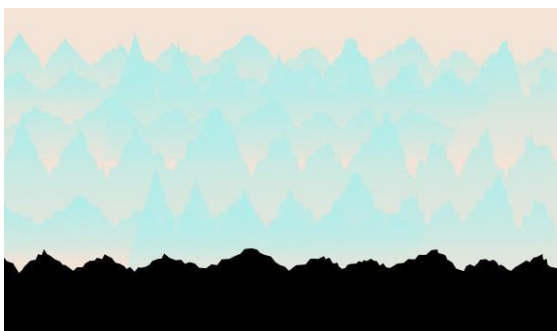


- Change the direction of the gradient from top to bottom as shown above.
- Create 4 to 5 more hills in the same process as described above.



[Screenshot]

- Create a hill with black colour in the bottom
- Create a rectangle in the bottom to extend the hill area if required
- You can copy the shapes which we have created above multiple number of times and arrange them one over the other to create the feel of a filled range.



[Screenshot]

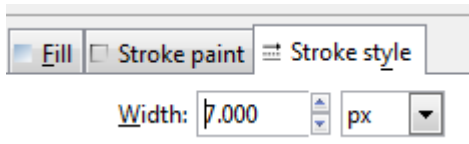
- Create shapes similar to building silhouette using Bezier tool or combination of tools.



- Select the shape and create a duplicate copy of the shape – Ctrl + D
- Move
- Mirror the shape using – Object – Flip Horizontal



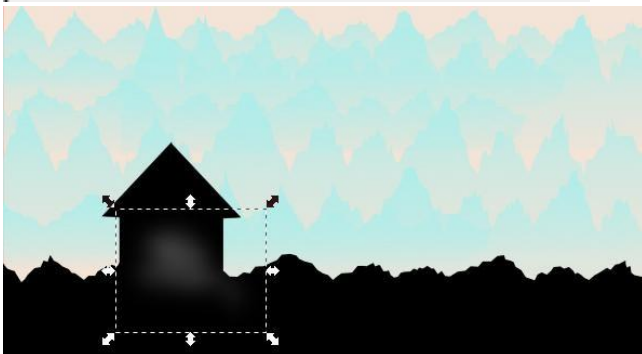
- We are using varieties of shapes to create these kind of texture effects.
- Creating mist and smoke kind of effects
- Draw thick lines using line tool and change the colour to White
- Stroke Style – 7 px



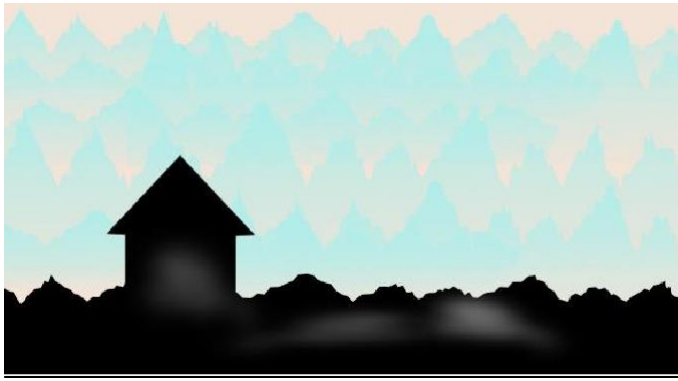
- Select the Line
- Blur – 27 , Opacity – 52.3%



□



- Create a few more mists as above.
- **FINAL OUTPUT**



[Screenshot]

Activity 6

- Download an image similar to above from internet for reference and follow the steps as mention above to create the design.
- Save the File in Inkscape Format as well as JPG format

Unit Summary

In this Unit we have studied about Texture Design. You have learnt the process of creating a texture which is inbuilt in Inkscape. We have described about process of using open source software's Inkscape for creating the Textures with help of combination of its options and Filter Effects. The study indicates that there is not limitation to the texture and applying a texture is an art. Varieties of combination of filters will create unlimited designs. The user has to create, judge and choose the best combination.

Assignment

- Create 20 rectangles in a file and apply the best effects as practiced by you.
- Create 5 types of Textured Text Effects
- Create 5 types of Pattern Effects.
- Create 5 types of Tiled Effects.
- Save the file in Inkscape format as well JPG format.
- Write the files in a DVD and submit it to the University.

Assessment

- Which option should be used for repeating a same design or tiling a design?
- Which option should be used to keep the object in perfect line either to the left, right or center?
- Which option is used to maintain equal spacing between shapes?
- Which option is used to convert Raster image into Vector image?

Resources

- Go through the following website for details of Inkscape tutorials:
<https://inkscapetutorials.org/tutorial-list-2/>

Unit 4 Practical- Create T-shirt design with vector art of Tiger

Introduction

is intended for people who aim to create designs for print medium on canvas, T-shirt etc.

T-shirt is the trend of all kinds of people in this generation. People from small kids to old people are fascinated towards T- shirt. T-shirt comes in all type of shapes & sizes with variety of colours and design. The interest towards T-shirt has created a great demand for T-Shirt designs.

The designs created by the designers using digital software's are excellent and vibrant in colour. There are lots of motivational texts used in the T-shirt which make them more attractive and appealing to the customer. The textile industry of today has a maximum share of T-Shirts rather than normal shirts.

Designing a T-shirt is a very interesting activity for a designer which includes lots of creativity as well as fun. The printing technology has also become economical and even single design can be printed on a single T-shirt at a nominal cost.

Outcomes

Upon completion of this unit you will be able to:

- *Describe* the meaning of vector design.
- *Create* a T-shirt design.
- *Prepare* various vector designs in Krita.
- *Create* a T-shirt design using Krita with Tiger Picture in Vector Art
- *Use* the T-shirt printing techniques

Terminology

Professional : Creating a work or a project which has a value in a systematic way and in stipulated time.

Output Format: Output format is format used to create an output in a Digital File. Every software has its own format for saving a file.

Vector Art

Vector Graphics is a very excellent and qualitative method of representation of shapes and text. It is created out of mathematical calculation which involves x and y coordinates of the end points or curve points of the shape or the text. Geometrical representation of shapes helps in low memory consumption and creates high quality expandable designs.

Each end point or curve is called nodes which are accompanied by tangent lines for

smoother representation. The below figure no. 1 represents the nodes and the tangent lines of a vector shapes in any vector based software.

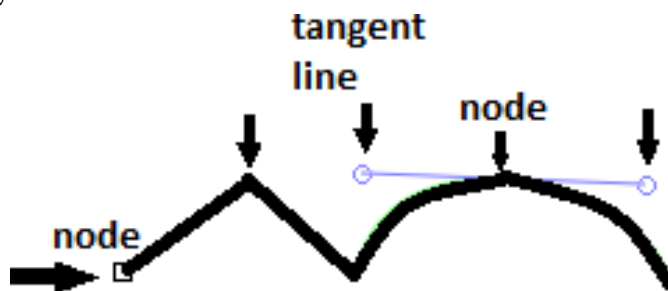


Fig 1: Representation of nodes and tangent lines in a vector shape. [Created by the Author]

The tangent line helps in creating a smooth shape without consuming more nodes in a shape.

The vector shapes may be open shapes or closed shapes with various colour filling capabilities. The shape can be given thickness, styles and so on.

The stroke properties of a Vector shape are as follows:

- Shape Width
- Shape Style
- Shape roundness

The fill properties of a vector shape are as follows:

- Solid fill
- Gradient fill
- Pattern fill

Steps in Creating a T-Shirt design

- Preparing a Plan for the design
- Reference Image collection
- Creating a Manual Sketch
- Choosing the software to create the design
- Scanning the drawing to Digital Software
- Colouring the design
- Giving depth to the design
- Creating a balance for the design
- Placement of elements on the T-Shirt
- Preparing a 4 to 5 styles and layout out of the same components
- Preparing of various colour schemes
- Review and finalizing the T-Shirt design

Preparing a Plan for the design

The first and foremost part is to prepare a layout plan of the design. This starts with the

concept requirement like who is the target customer i.e. child, youth, professional etc. After identifying the segment for use the elements required for the design is planned.

Reference Image collection

Before starting the actual work, lots of reference study has to be done through internet, visiting various T-shirt showrooms etc. A reference study will make clear about the common elements used in the T-shirt design which attracts the targeted segment.

Creating a manual sketch

A manual sketch of the T-shirt design is made by artists. There are hundreds of drawings which are roughly drawn first. After finalizing the shape of the drawing a clean-up drawing is drawn out of the rough drawings. The clean-up shape means the only outline shape of the drawing representing the main character.

Choosing the software to create the design

After the manual sketch, comes the digital process. Here the artist has to choose the software to digitize the drawing. The drawing may be raster or vector. However, in today's market, most of the work is done using Vector process. This helps the designer in future adjustments as well as scalability of the shape. Again choosing the software may be choice of an artist or the choice of the company where the artist works. An artist may be efficient in Krita, but if the company policy is to work on Inkscape, then the artist has to work on Inkscape. Hence, an artist should know the process of transferring the work done in Krita into Inkscape and vice versa.

Scanning the drawing to Digital Software

Once the manual drawing is finalized and the software is chosen, now is the process of bringing the manual drawing into Computer screen using Scanners. This can be done using digital camera also. Now-a-days the camera's come of very high resolution hence scanners are used in limited purposes.

Colouring the design

After drawing the shape in Vector software, the process of colouring begins. There are three types of colouring:

- i. Solid Colouring – Single colour
- ii. Gradient Colour – Shade of colours
- iii. Patching colouring – Single colours are used in three tones, one is normal colour, second is the dark shade of the normal colour and the third colour is usually white or the light shade of the normal colour.

Giving depth to the design

After the base colouring is done the next step is to give depth to the design. This effect

can be achieved by combining some elements of design in quite a similar manner as it is done while creating a drawing with pencil; shading, colour toning, using hatched textures etc. This helps in producing 3D effect in digital art work (design) too.

Creating a balance for the design

Before going to the printout, a balance of the design is done with the base colour of the T-shirt. It is very important for the colour of the T-shirt and the colours of the design used to print. Sometimes a single design needs to be printed in various colours of T-shirt. Hence a colour balance check has to be done and a unique colour has to be chosen which fits all the variety colours of the T-shirt.

Placement of elements on the T-Shirt

After the colour combination, it is the placement of the design on the T-shirt. It may be in the middle, left, right, hand portion, neck portion etc.

Preparing a 4 to 5 styles and layout out of the same components

Various types of layouts are made out of the same components and texts used in the design and the final is chosen by the supervisors or owners.

Review and finalizing the T-Shirt design

Finally, a sample T-shirt is printed out of all varieties and queued for review. After finalizing, it goes to the printing phase.

Creating T-Shirt Design using Tiger Picture in Vector Art using Krita

- Plan and Concept of the design
- Download photographs of reference T-shirt containing vector Illustration
- Downloading reference photograph of Tiger Vector Art from internet
- Pen Tool Tracing in Krita
- Raster to Vector in Inkscape
- Finalizing the work
- Fitting the design into T-shirt for finalization.

Plan and Concept of the design

The motto of creating our T-shirt design is using a Tiger Illustration in the T-shirt. We have to create a Tiger illustration in digital software and make it ready for printing in a T-shirt.

Download Photographs of reference T-Shirt containing Vector Art

First, we have collected the reference of some T-shirts from the Internet sources. The images of T-shirt which we will use as reference are as follows:



Fig 2. Downloaded T-Shirt Design

Title: T-Shirt Design

Attribution: ahmadkosasih110 [User name as per pixabay] Source: Pixabay

Link: <https://pixabay.com/en/design-tshirt-coffee-lovers-print-1772284/>



Fig. 3. Downloaded T-Shirt design

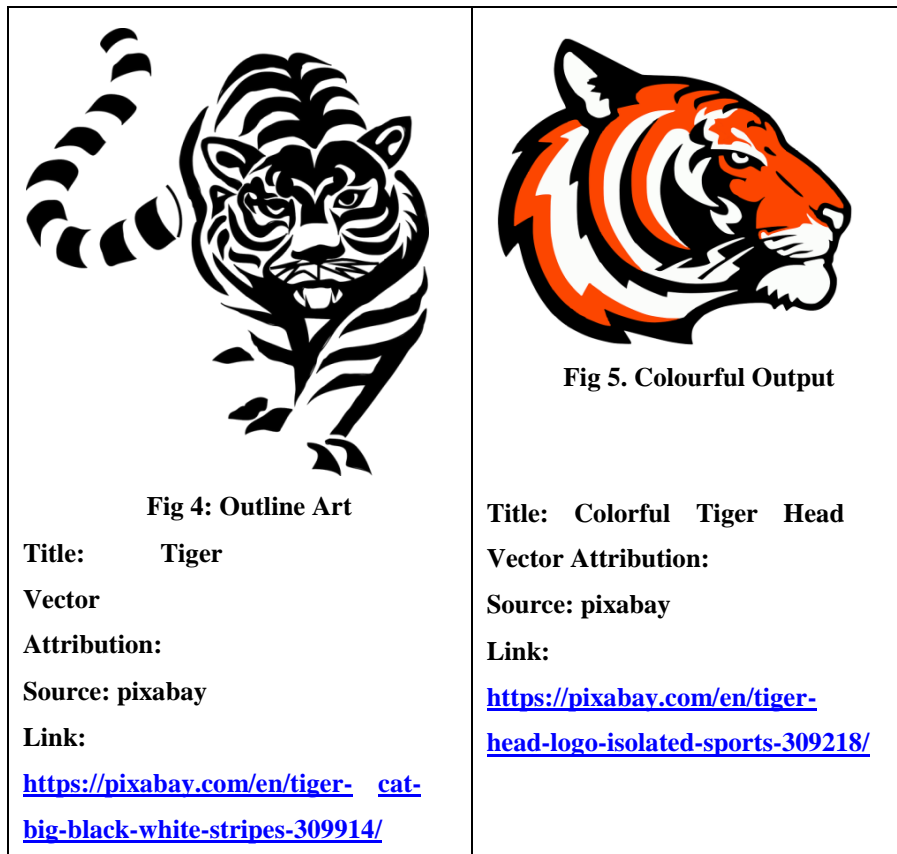
Title: T-Shirt Design

Attribution: ahmadkosasih110 [User name as per pixabay] Source: Pixabay

Link: <https://pixabay.com/en/bad-story-design-tshirt-lettering-1772283/>


Downloading reference Photograph of Tiger Vector Art from internet

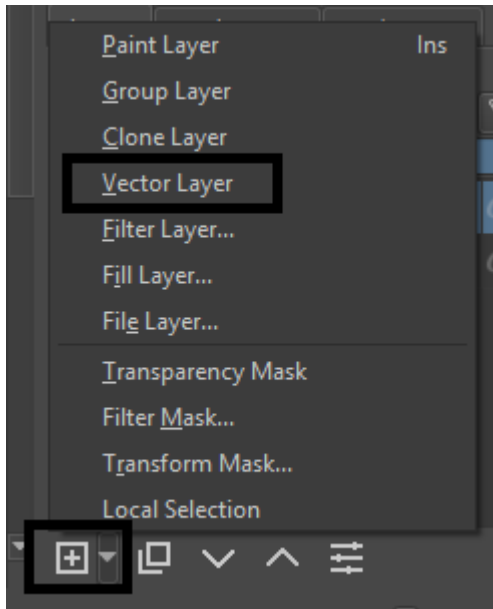
- Open Google Chrome
- Go to Images
- Search for “Tiger Vector Art”
- Choose the files which you want as reference to create your own vector art.
- Save the files in a folder






Pen Tool Tracing in Krita

We will follow a Figure of Tiger as the base image for preparation of Vector design in Krita.





- Take a Photograph of a drawing a Tiger using any Smartphone or a Digital Camera.
- Transfer the Photograph to your computer.
- Open Krita
- Open the Photo of the reference of the Tiger
- Select Menu – Select All
- Edit Menu – Copy
- Open Krita
- File – New – Choose the size as the printable area of the T- shirt [Measure using scale]
- Edit - Paste
- Choose the Transform tool  and Transform the Photo and resize according to the screen.
- This image is a symmetrical image [Right side is the opposite of Left Side]. So, we can trace one side and copy the opposite side.
- New Vector layer

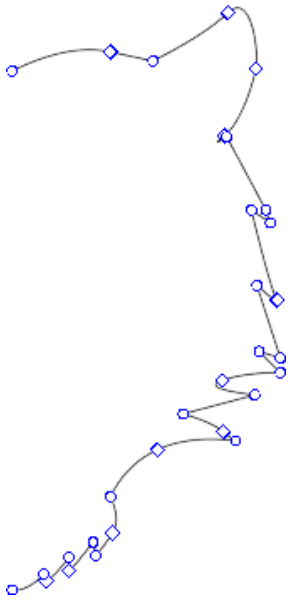


- Choose Brush Tool  - Brush Settings -  - Choose a Round Brush
- Choose Bezier Curve Tool - 
- Click and draw the outline shape – Press Enter
- Continue the above process till completion.
- Work in Progress –



[Snapshot]

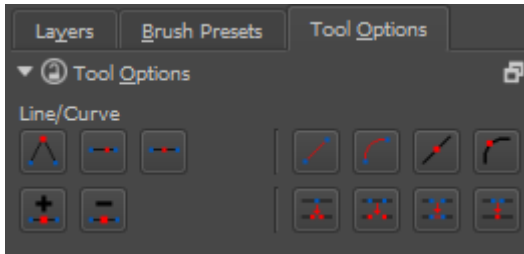
- We can adjust the points after drawing the lines also.
- Choose the shape manipulation tool. 
- Left click and drag over a shape.
- The bottom tool under this Shape manipulation tool  will change to Path Editing tool 
- Choose the Path Editing tool 
- Click and move to adjust the points.



-

[Snapshot]

- Go to Tool Options – We have got extra options like Add points, Remove points etc. to modify the shape further.

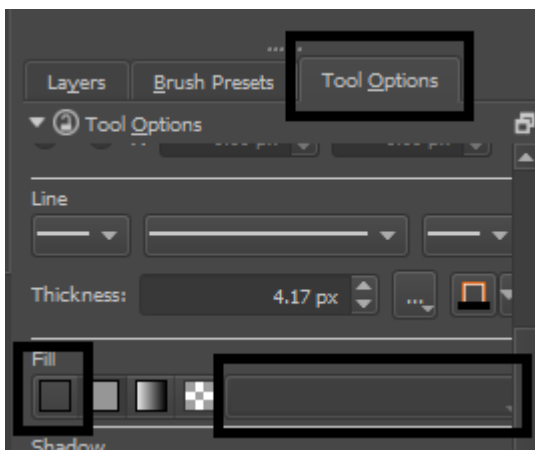


- We will trace each and every shape categorically to complete the drawing. We will trace half of the shape and copy and create the symmetry.

Outline shape of face



-
- Tools Options – Fill with Black colour





- Right Click on Layer – Duplicate Layer
- Transform Tool – Tool Options – Mirror Horizontal
- Move and Place

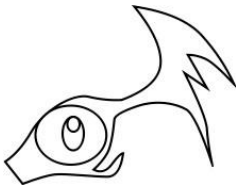


•

[Snapshot]

Eyes

- New Vector Layer
- Use Hide and Unhide layer whenever required



- Select and fill with colour,



Mouth, Nose, Lips, Tongue, Teeth

- New Vector Layer
- Use Hide and Unhide layer whenever required



- Select and fill with colour,



[Snapshot]

Ears



- Select and fill with colour,



Inner Shapes





- Select and fill with colour,
- Finalise the output by duplicating the layer and creating the mirror.



[Snapshot]

- The output file and the original file may vary according your creativity.

Note It

You can use various categories of brushes experimentally and complete the Tiger Vector Art. It requires:

- Technical software knowledge
- Creativity
- Not Hard Work But Work with Patience
- Extensive research of internet video tutorials to create a vector art.

There are various ways to do a certain works; you have to choose your process which is convenient and easy for you.

Fitting the design into T-Shirt for finalization

- Open Krita
- Open the Tiger Traced File

- File – Open the T-shirt image



[Snapshot]

- Select All – Edit – Copy
- New File – Set the size according to the T-shirt size [Measure it with scale or tape]
- Edit – Paste the T-shirt
- Drag the T-shirt layer behind the Tiger character layers.
- Output File



[Snapshot]

Printing Techniques of a T-Shirt

There are varieties of printing techniques available in the market. Some are for bulk printing and some are used for single printing purposes. The designer has to decide the printing technique which best benefits the design and economy.

Screen Printing

This is the oldest method of printing which is still prevailing today. It is the method which is mostly used for printing on T- Shirts.

Screen printing for different colours are done on different phases as per the colour. If we have three colours in our design then there has to be three different screens and three passes has to be done on the T-Shirt. It is considered as a high quality print.

The process can be done manually as well as through machine. The one time setup cost is high but is economical in case of bulk printing.

The one disadvantage in this type of printing is that it cannot be printed on dark colour base with light colours.

Direct to Garment Printing (DTG)

This is the new technology available in the market in which the multi-colour design can be directly printed on a T-Shirt. The cost of the printer is very high but the quality of the print is excellent. It has left behind the traditional method of T-Shirt printing and marching ahead by getting more and more attraction. It is almost equal to a colour print on a paper. It has the capacity to print millions of multiple variable colours at a single go. The time consumed for printing is longer than usual printing techniques.

Heat Press Transfer Printing

This technology is used to print on T-shirts. In this case, first a colour printout is taken on a piece of paper. Then the paper is placed upside down on the T-shirt and it is heat pressed for some time. It is heated at 180 degrees for 20 to 30 seconds. After the prescribed time, the heat press is removed and the colours on the paper get transferred to the T-Shirt. It is very faster and easy to use.

Heat Transfer Vinyl Printing

This is the technology used to print Hoardings on Flex. This is a perfect option for T-Shirt printing also. First, the design is printed on a vinyl sheet instead of a plain paper. Then the vinyl sheet is heat pressed on the T-Shirt. This technique is mostly used for simple printing purpose. It is not used for bulk printing. The quality of the print will be felt only when it is instantly used by the user. If it is printed in bulk for sale purpose, then the quality reduces on stock transfer from one place to another and if the sales take a longer period then also the quality reduces.

Dye Sublimation Printing

In this technology, the heat is transferred onto garments of polyester and its coated products such as mugs, plates etc. This technique is used for printing key chains, photos on mugs, mouse pads etc. It requires a special paper to be digitally printing and then it is heat pressed on the polyester surface. This is mostly done for gift giving purposes of the consumer.

Professional guidance for T-Shirt design

There are lots of professional aspects which have to be taken care while designing a T-Shirt. Some of the aspects are as follows:

Workout hard on the concept

Creating a design is like writing a book or poetry. It is an Art. It is not a straight forward mathematics. You have to go through lots of brainstorming for creating a design. You have to fill your mind with lots of crazy ideas to genuine ideas. And at last, after exploring most of the possibilities, filter out the best and start working on it. There is a saying that more time has to be given on the plan so that if the plan is perfect then the execution will be faster and smoother.

Pre-visualise the output

It is said that you must have a dream first before achieving something. Hence, you should have a clear visualization of the output before starting any work. Once you have the visualization and start the technical process, then there are lots of ways to accomplish the design.

Simple design with clarity

The design has to be simple with required details and be clear in quality. Most of the best T-shirt designs of branded companies are plain with attractive typographies. More details in a T-shirt are not visible and get distorted quickly after a few washes. Hence smaller details have to be avoided in T-shirts. Only bigger and bold designs have to be used.

Market study

A market study of the consumer is very essential while making a product else all the hard work will go in vain. The consumer has to be categorized like child, youth, male, female, old etc. A similar style used by them has to be studied like what colour they like, what type of text they like and so on. After that the design has to be done keeping in mind the common elements of design.

Creating humour using Cartoons, shapes and text.

Today we see T-shirt with motivational text and humorous Text arranged with a good typographical design. Abstract Shapes are used in the background with cartoons or photographs of birds, sceneries etc. Humour attracts people and makes them look important. Hence, a T-shirt should be made attractive with the elements of humour as per the age category of the person.

Colour combination

Colour combination is very important in all kinds of design. In a T-Shirt there is a base colour which comes with the T- Shirt and other colours are used by the designer while designing. There should be a balance in both the colours. If the base colour is dark, then the design colours have to be light and bright. And if the base colour is light, then the design colour

has to be deep and dark.

Drawing with perfect proportions

Drawing on T-Shirt is like designing a cover of a Book. The drawing has to be in perfection proportions without mistakes to get attraction. People generally identify the proportional mistakes as the output with wrong proportion misrepresents the image or drawing.

Utilising the best printing technology

There are lots of printing options available in the market. T-Shirts can be printed individually as well as in bulk. The best printing ensures that the T-Shirt design will be more durable and does not get faded in few washes. Sample print designs can be made before ordering bulk quantities for print. This is a safe option used by most of the branded companies.

Learn the latest software techniques

Software's get updated every six months and new options are added for the convenience of the designer. Getting frequently updated with the software will help the designer to create newer designs and work in a faster way. The more we learn about technology we will have lots of variety of designs. And today the consumer wants variety out of which he has the option to choose. The concept of big bazaar is successful because people have the option to choose out of hundreds of brands.

Always be creative and innovative

Consumer today wants to be new and different from the others. He wants to gather attention wherever he goes. Hence, he chooses the best design available in the market and the normal designs remain unsold for years which are further sold on discount to clear stocks. It is you to decide whether you want to be creative and remain forward or get unnoticed for a distress sale in the future. Hence, be creative and innovative and create eye catching attractive designs applying most of the techniques of a successful T- Shirt design.

Unit summary

In this Unit we have learnt some of the Krita tools and techniques.

We have created a Vector Art of Tiger and placed in a T-Shirt. T- Shirt design is the new trend which has emerged since the printing on T-shirt has become easier. Apart from T-shirt vector design, you can use Krita for all kind of vector designing and printing purpose.

You can create Book Cover Designs, Leaflets, Flyers, Banner design etc. also using Krita.

Assignment

- Create a Vector Design of Tiger in Krita.
- Identify the place near your area where T-shirt printing is done.

- Print the Vector Design of Tiger on a T-shirt with you name printed on it as a Designer.
- Write the class work's done in Krita in a DVD and submit it to the University.

Assessment

- Write down five professional tips for a T-Shirt design.
- Write down the names of any four types of T-Shirt printing techniques.

Resources

<http://www.wikihow.com/Design-Your-Own-T-Shirt>

<http://www.creativebloq.com/design/guide-t-shirt-printing-designers-912867>

<https://helpx.adobe.com/illustrator/how-to/design-a-tshirt.html>

<https://wegraphics.net/blog/articles/a-comprehensive-guide-to-designing-and-printing-your-first-tee-shirt/>

યુનિવર્સિટી ગીત

સ્વાધ્યાય: પરમં તપ:

સ્વાધ્યાય: પરમં તપ:

સ્વાધ્યાય: પરમં તપ:

શિક્ષણ, સંસ્કૃતિ, સદ્ભાવ, દિવ્યબોધનું ધામ
ડૉ. બાબાસાહેબ આંબેડકર ઓપન યુનિવર્સિટી નામ;
સૌને સૌની પાંખ મળે, ને સૌને સૌનું આભ,
દશે દિશામાં સ્મિત વહે હો દશે દિશે શુભ-લાભ.

અભણ રહી અજ્ઞાનના શાને, અંધકારને પીવો ?
કહે બુદ્ધ આંબેડકર કહે, તું થા તારો દીવો;
શારદીય અજવાળા પહોંચ્યાં ગુર્જર ગામે ગામ
ધ્રુવ તારકની જેમ ઝળહળે એકલવ્યની શાન.

સરસ્વતીના મયૂર તમારે ફળિયે આવી ગહેકે
અંધકારને હડસેલીને ઉજાસના ફૂલ મહેકે;
બંધન નહીં કો સ્થાન સમયના જવું ન ઘરથી દૂર
ઘર આવી મા હરે શારદા દૈન્ય તિમિરના પૂર.

સંસ્કારોની સુગંધ મહેકે, મન મંદિરને ધામે
સુખની ટપાલ પહોંચે સૌને પોતાને સરનામે;
સમાજ કેરે દરિયે હાંકી શિક્ષણ કેરું વહાણ,
આવો કરીયે આપણ સૌ
ભવ્ય રાષ્ટ્ર નિર્માણ...
દિવ્ય રાષ્ટ્ર નિર્માણ...
ભવ્ય રાષ્ટ્ર નિર્માણ

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