MNM-003

Indira Gandhi National Open University
School of Computer and Information Sciences

DIGITAL PHOTOGRAPHY & VIDEOGRAPHY

Indira Gandhi National Open University

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Dr. Ramesh Yadav,
Assistant Professor, SOJNMS, IGNOU

Ms. Padmini Jain,
Assistant Professor, SOJNMS, IGNOU

PROGRAMME COORDINATOR: Dr. Amit Kumar

COURSE EDITOR AND COORDINATOR: Dr. Amit Kumar

BLOCK 1 PREPERATION TEAM

Unit 1	Prof. Gauri D Chakraborty Professor, Times School of Media, Bennett University	Unit 2	Adopted from Unit-6, MJM-027	**Block Editor and Coordinator:** Dr. Amit Kumar Assistant Professor, SOJNMS, IGNOU
Unit 3	Adapted from Unit-12, MJM-027 and Revised by Dr. Amit Kumar, SOJNMS,IGNOU	Unit 4	Dr. Amit Kumar Assistant Professor, SOJNMS, IGNOU & Dr. Poonam Gaur, Assistant Professor, ASCO, Amity University, NOIDA	

BLOCK 2 PREPERATION TEAM

Unit 5	Dr. Poonam Gaur, Assistant Professor, ASCO, Amity University, NOIDA & Dr. Amit Kumar Assistant Professor, SOJNMS, IGNOU	Unit 6	Adopted from Unit-7, MJM-027	**Block Editor and Coordinator:** Dr. Amit Kumar Assistant Professor, SOJNMS, IGNOU
Unit 7	Adopted from Unit-8, MJM-027	Unit 8	Adopted from Unit-9, MJM-027	
Unit 9	Mr. Nithil Dennis Associate Professor, Royal Thimphu College, Bhutan	Unit 10	Adopted from Unit-11, MJM-022	

BLOCK 3 PREPERATION TEAM

Unit 11	Adapted from Unit-12, MJM-27 and Revised by Dr. Amit Kumar, SOJNMS, IGNOU	Unit 12	Adapted from Unit-13, MJM-027	**Block Editor and Coordinator:** Dr. Amit Kumar Assistant Professor, SOJNMS, IGNOU
Unit 13	Adapted from Unit-13, MJM-027 and Revised by Dr. Amit Kumar, SOJNMS, IGNOU	Unit 14	Dr. Amit Kumar Assistant Professor, SOJNMS, IGNOU Partly adapted from Unit-11 MJM-027	

COURSE INTRODUCTION: DIGITAL PHOTOGRAPHY & VIDEOGRAPHY

Digital Photography and Videography are important areas of electronic media. As a student of electronic media, and as a future practitioner, academician or researcher in this field, it is essential that you are exposed to these areas.

The course MNM 003 Digital Photography & Videography has been developed in a systematic way so that you can understand the basics of visual communication, structure and functioning of cameras, composition, lighting, and editing in a systematic manner. It has been presented in three blocks comprising 14 units, covering a range of issues in digital photography and videography.

Block 1: Tools of Digital Photography talks about the different tools of photography. Unit 1 gives an overview of the journey of photography; Unit 2 focuses on the different types, structure and functioning of cameras; Unit 3 describes the lighting techniques; and Unit 4 discusses the various lenses and accessories used is photography.

Block 2: Art and Craft of Digital Photography deals with the important aspects of photography. Unit 5 introduces the visual communication. Some important theories of visual communication have been discussed in this unit; Unit 6 talks about photographic composition. Different elements and principles of composition have been discussed here; Unit 7 focuses on some important techniques of digital photography; Unit 8 deals with photo editing. This unit includes photo editing tools and also talks about the ethical aspects of image editing; Unit 9 covers different types photography; and Unit 10 is based on photojournalism.

Block 3: Recording Moving Images covers the different important aspects of video recording. Unit 11 explains some more lighting related issues; Unit 12 describes different types of shot sizes and camera angles; Unit 13 talks about various camera movements and their use in video production; and Unit 14 discusses some useful video recording techniques.

We hope that you will find the course content informative and useful, and after completing this course, you should be able to:

- describe the types and functioning of still and video cameras;
- understand the art and craft of digital photography;
- explain the types of shots, camera movements and lighting for electronic cinematography/videography.

CONTENT

Unit 1	History Of Photography	1
Unit 2	Camera Types Structure and Functions	18
Unit 3	Lighting Techniques - I	35
Unit 4	Lenses and Other Accessories	47
Unit 5	Intoduction to Visual Communication	59
Unit 6	Photographic Composition	73
Unit 7	Photography Techniques	91
Unit 8	Photo Editing	112
Unit 9	Types Of Photography	125
Unit 10	Phtojournalism	142
Unit 11	Lighting Techniques - II	156
Unit 12	Shot Sizes & Camera Angles	168
Unit 13	Camera Movements	181
Unit 14	Video Recording Techniques	191

UNIT 1 HISTORY OF PHOTOGRAPHY

Structure

1.0 Introduction

1.1 Learning Outcomes

1.2 Pre Photography developments

1.2.1 Light and Image

1.2.2 Camera Obscura and The Pioneers

1.2.3 Associated Scientific Developments

1.3 Early Photography Techniques

1.3.1 Capturing of an image: Heliography

1.3.2 The Technique of fixing of the image: Daguerreotype

1.3.3 Talbot and the Calotype

1.3.4 Amateur Photography and Kodak

1.4 Evolution of Technique

1.4.1 Twin Lens Reflex

1.4.2 Single Lens Reflex

1.5 Different types of Cameras

1.5.1 Point and Shoot Cameras

1.5.2 Polaroid Cameras

1.6 Digital Era

1.6.1 Invention of the DSLR

1.7 Let Us Sum Up

1.8 Check Your Progress: Possible Answers

1.9 References and Further Readings

1.0 INTRODUCTION

It is commonly said, ‘ a picture is worth a thousand words.’ In today’s day and age, when the picture can be easily clicked with a simple mobile phone, it is unimaginable to think the vast number of inventions, ideas and research that has gone into the human fascination for capturing the image.

Photographic Science required human toil and research of more than two thousand years to reach the present day developments. The meaning of the term Photography is “Photos” + “graphein” = to paint with light. This implies that the human invention connected to photography was directly related to the research and understanding of light as a medium. This includes the very basic principle that light travels in straight lines. Many inventors and scientists worked on different principles, methods of capturing light, quality of lenses, photosensitive material till the overall invention of photography as an invention could be registered.

The evolution of photography as a medium can be separated in five distinct stages. These are the following:

•	STAGE 1	Till 1800 A.D	Pre-photography inventions
•	STAGE 2	1800-1900	Early Photography
•	STAGE 3	1900-1945	New Technique
•	STAGE 4	1945-1970	Popularity
•	STAGE 4	1970 onwards	Digital Innovation

The period of World War I (WW-I) is a critical period in the history of photography . Before WWI (1914 -1919), the focus was on literary ways of communictaion. Photographs were considered an addition to information. WW-I created the significance of photographs whether it was for documentation or for propaganda purposes. Furthermore, improvements in technology and simplification of processes transformed photography from a specilist pursuit among selected people to a popular hobby practiced by millions. Professional photography also evolved as a genuine profession considering the need of a commerical industry now dependent on pictures especilly mass communication meidums like print. In fact specilised aspects of photography like aerial photography was first practiced in 1858. By 1914 with the outbreak of the war, it now became a valuable cpmponent of scientific and military recording of war zones.

1.1 Learning Outcomes

After going through this unit, you will be able to:

- understand light as an integral part of invention of photography;
- identify the various phases in the development of photography;
- analyse the need based approach in its evolution; and
- explain the transition from analogue to digital method of capturing images.

1.2 PRE PHOTOGRAPHY DEVELOPMENTS

The pre photography period is the period in human history when various scientists, philosophers and thinkers explored the qualities and attributes of light. During this period two major developments took place. The optical principle of light, which has the ability to form images, was observed and the fact that some chemicals undergo change as they have exposure to light was also investigated. These developments were studied independent of each other in different parts of the world.

The major landmark developments, which can be considered, are:

- Preliminary Investigations with chemicals
- Preliminary Investigations with light
- Camera Obscura

1.2.1 Light and Image

In simple words, a photographic image is created by capturing various amounts of light reflected from the various parts of a scene. It is important to note that the fascination of human mind in recording the image seen by the human eye. Before any concept of capturing an image, it was important to understand the nature of light and basic attributes of lenses. Recording light and creating a latent inverted image was far more harder.

Many philosophers and scientists across the world have mentioned the ability of light to travel in a straight line, diffract and create an image. These include Chinese philosopher Mozi in the 5th century, BC. Greek philosopher Aristotle noticed that light passing through holes between leaves projected an image of a sun eclipse on the ground. Many scientists to understand the behavior of light and its ability to travel in a straight line performed various experiments across the world using pinhole kind of devices.

1.2.2 Camera Obscura and The Pioneers

Camera Obscura, a dark chamber or room with a hole - probably known to Aristotle more than 2,000 years ago. Aristotle (384-322 BC) understood the optical principle of the camera obscura. He viewed the crescent shape of a partially eclipsed sun projected on the ground through the holes in a sieve. This can be considered as the ancestor of the photographic camera.

In Latin the term means “dark chamber,” and the earliest versions, consisted of small-darkened rooms with light admitted through a single tiny hole. The result was that an inverted image of the outside scene was cast on the opposite wall. For centuries, the technique was used for viewing eclipses of the Sun without endangering the eyes.

Another mention of this type of device was by the Chinese philosopher Mo-Ti (5th century BC). He formally recorded the creation of an inverted image formed by light rays passing through a pinhole into a darkened room. He called this darkened room a "collecting place" or the "locked treasure room."

In 1490 Leonardo Da Vinci is known to draw two clear descriptions of the camera obscura. In 1544, Dutch scientist Reinerus Gemma-Frisius mentions large rooms in use for observing a solar eclipse. In the 16th century the introduction of a convex lens to imprive image quality and then addition of a mirror to reflect image are also documented. In 1558, Giovanni Battista Della Porta recommended the use of such a device to aid for drawing for artists.

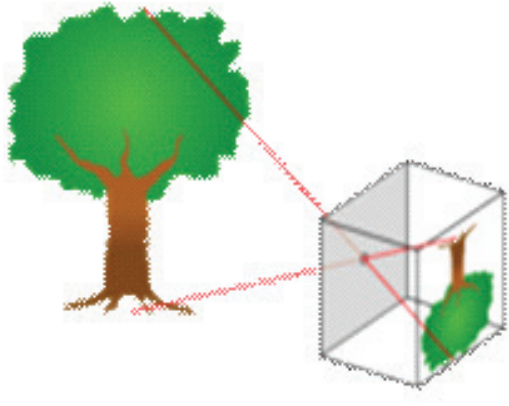


Image (1.1) Source: http://commons.wikimedia.org/wiki/Image:Pinhole-camera.png

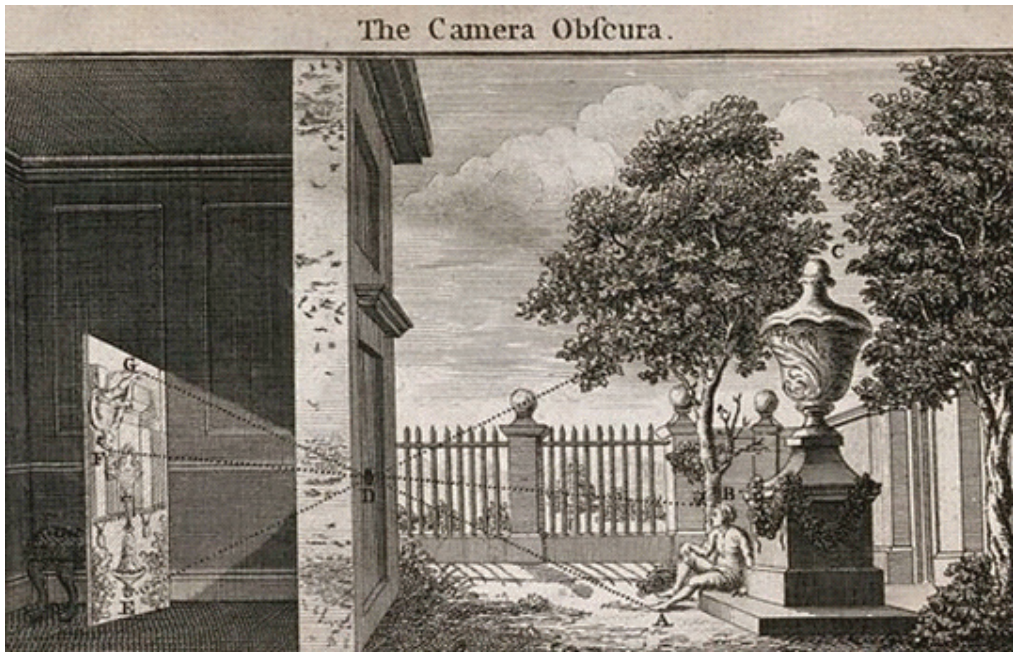


Image 1.2 The principle of Camera Obscura. Illustration of the camera obscura principle from James Ayscough's A Short Account of the Eye and Nature of Vision. Image Source: https://www.lookandlearn.com/history-images/YW025358V/Optics-the-principle-of-the-camera-obscura Creative Commons Attribution (CC BY 4.0))

1.2.3 Associated Scientific Developments

The process of photography or capturing an image thru the medium of light interacting with a light sensitive material has been a tedious journey of many associated developments initiated by different discoverers, scientists and inventors. Some of these important milestones are:

- **1100 - 1600 - Discovery of Silver Halides.**

A silver halide, which can also be understood as a silver salt, is an important chemical compound in the evolution of photography. This compound is a combination between Silver and a halogen. Examples of halogens are chlorine, iodine and bromine. Silver halides are the light-sensitive chemicals, which are critical because they are commonly used in photographic film and paper.

- **1560’s - Description of a diaphragm**

Daniele Barbaro was a key figure who contributed to understanding of a diaphragm or aperture. In his 1567 work La Pratica della Perspettiva, he suggested that the picture etched by using a camera obscura is clearer if the lens is covered to close in on less circumference in the center. This is the beginning of understanding aperture size and sharpness of image.

- **1660’s - Discovery of composition of white light**

The scientific composition of light as a mixture of the VIBGYOR colors began with Isaac Newton experiments with light. The colors within light are red, orange, yellow, green, blue, indigo and violet.

- **1700's - Photo-chemical effect**

Wilhelm Homberg is a key figure whose experiments helped explain how light darkened some chemicals. In 1705, he identified the sulfur principle with light. Homberg's theory reflects the interaction of light with matter.

- **1720's - Silver Nitrate**

Johann Heinrich Schulze discovered that silver nitrate darkened upon exposure to light. Schulze proved that the darkening of silver salts was caused by light and not heat. Though demonstrated the fact using sunlight to record words on the salts, he made no attempt to preserve or fix the images permanently.

Check your progress: 1

Note : Use the space below for your answers.

Compare your answers with those given at end of unit.

Q 1 : Mention at least one important pre development to the invention of photography.

Q 2: Why is it said that Photography wasn't a brainchild of any single person.

Q 3: Explain the term 'Camera Obscura.' Mention some of its early uses.

1.3 EARLY PHOTOGRAPHY TECHNIQUES

In this section we shall discuss early photographic techniques. This discussion will help us to understand the different stages in the development of photography.

1.3.1 Capturing of an image: Heliography

The French physicist, Joseph Neipce, was able to capture the first known photograph (he called it a heliograph) in 1826. Neipce was an amateur inventor who lived in a city close to Paris. He had interest in Lithography. Lithography is a process in which drawings are copied or drawn by hand onto lithographic stone and then printed in ink. Using this knowledge, he devised a method by which light could draw the pictures he needed.

Neipce used the acid resistant Bitumen of Judea, which was used in etching. Bitumen hardened with exposure to light. In his experiments, he coated Bitumen on glass plates, pewter and other materials. Finally, he was able to register an image from the window of his room in 1826. This exposure was approximely for 8 hours !

Image 1.3 The first photograph – as heliograph: View from the Window, 1826

Source:https://en.wikipedia.org/wiki/View_from_the_Window_at_Le_Gras#/media/File:View_from_the_Window_at_Le_Gras,_Joseph_Nic%C3%A9phore_Ni%C3%A9pce.jpg Public Domain

1.3.2 The Technique of fixing of the image: Daguerreotype

In 1827 Niepce had also begun his association with Louis Daguerre, a French painter who had also been experimenting along parallel lines. In 1839, the daguerreotype was announced. This was an invention of a method for making a direct positive image on a copper plate with a thin coat of silver. The process had its disadvantages and was to be done with great care. The plate had to be clean and polished till the surface looked like a mirror. It was then exposed to iodine and transferred to a camera. These cameras had a sliding box design.

Image 1.4 Cameras with a sliding box design

(Source: image from public domain)

The most dangerous and hazardous part was that after being exposed to light, the plate was developed over hot mercury until the image appeared. In order to permanently fix the image, this exposed plate was immersed in a solution of sodium thiosulfate or salt and then toned with gold chloride. To etch an image exposure timings could be anything from 3-15 minutes.

This form of photography was very popular in Europe in the mid 19th century and parlors had sprung up looking at the popularity of image capturing. A disadvantage of the daguerreotype process is that it was impossible to duplicate an image. The images produced are positives rather than negatives.

Image 1.4 A visual of the Daguerreotype

Source:https://upload.wikimedia.org/wikipedia/commons/6/6a/Woman_with_an_Accordion_daguerreotype_MET_DP224724.jpg Metropolitan Museum of Art, CC0, via Wikimedia Commons

1.3.3 Talbot and the Calotype

The daguerreotype had its base on metal. The process was also cumbersome and dangerous as there was use of mercury vapour in the fixing process. In 1840, while experimenting with Gallic acid Talbot discovered that the acid could be used to develop a latent image. Gallic acid is a chemical, which increased the sensitivity of his prepared paper. This discovery revolutionized photography on paper. The exposure time came down substantially from around one hour to produce a 6.5-by-8.5-inch negative to barely one minute of exposure. Talbot named his improved negative process the Calotype meaning “beautiful picture,” in Greek. The Calotype initiated the introduction of paper as a base instead of metal.

1.3.4 Amateur Photography and Kodak

In 1879, John Carbutt an English photographer thought of using gelatin based dary plates. This was a major development in considering a gelation and emulsion based coating for purpose of fixing the image. In 1887 Hannibal Goodwin who was based in New Jersey, USA, developed the idea of using celluloid as a base for photographic emulsions. George Eastman,the founder of KODAK – who had earlier experimented with sensitized paper rolls for still photography, began manufacturing celluloid rollfilms in 1889 at the plant in Rochester, New York.

The most important development in the history of photography was the introduction in 1888 of the Kodak #1 camera and the start of amateur photography. George Eastman invented the simple box camera Kodak that came loaded from the company with a 100-exposure roll of film. When the roll was exposed, the entire camera was sent back to the factory in Rochester. The roll was processed and a new roll was reloaded for the customer, where

it was reloaded and returned to the customer while the first roll was being processed. This was the beginning of a new era. By 1898, just a decade after this development, over 1,500,000 roll-film cameras had reached the hands of amateur shutterbugs.

Image 1.5 Advertisement of the Kodak Camera (Image from public domain)

Check your progress: 2

Note : Use the space below for your answers

Compare your answers with those given at end of unit.

Q 1 : Mention at least one early process of capturing the image.

Q 2 : What were the disadvantages of the Daguerreotype ?

Q 3: How did the Kodak camera encourage amateur photography ?

1.4 EVOLUTION OF TECHNIQUE

The period from 1900 -1945 saw a tremendous growth in the understanding, propagation of photography as part of mass communication as well as development in technique. This is the period when the WWI propelled the use of the camera both for war imagery and propaganda.

One of the examples is Kodak produced a small, portable camera from 1912-26, called the Vest Pocket Autographic, nicknamed the “soldier’s camera.” Kodak sold nearly two million of these cameras.

Image 1.6 Kodak's Vest Pocket Source:https://commons.wikimedia.org/wiki/Category:Kodak_Vest_Pocket_Autographic_cameras#/media/File:Kodak_advertisement.jpg Public Domain

1.4.1 Twin Lens Reflex

TLR means Twin Lens Reflex because the camera has two lenses. One is used for viewing and capturing. The reflex is related to the mirror used behind the viewing lens. This allows focusing. Both the lenses are constructed with equal focal length and equal speed. One lens directs light to the dark chamber onto film, the other one helps the photographer to frame the photo. Japanese Yashika and German Rollie are two companies which produced the TLR. Most TLRs take the large format 120 mm in a 6 X 6 size.

Advantages:

- Quiet cameras
- Viewfinder image matches image size of film
- Viewfinder does not go black when exposing
- Uses leaf shutters which can sync with a flash at any speed

Disadvantages:

- Parallax error is a problem at close distance. It means because the lens taking image and capturing image are not the same. Parallax is a displacement or difference in the apparent position of an object viewed along two different lines of sight.
- Cant interchange lenses so frequently
- Are large and heavy
- May put photographer at risk in volatile situations since stance is of looking downwards rather than in front

1.4.2 Single Lens Reflex

The SLR or Single Lens Reflex camera, has one lens through which the photographer views and clicks the image. The first 35mm film SLR camera in the world was called Kine Extakta and was developed in Germany in 1936. This camera did not allow viewing of image without it being reversed. It was only after the invention of the roof prism by Kurt Staudinger in 1931, did the SLR become a preferred option. By 1943, it became possible to look at a non-reversed and upright image through the viewfinder at eye-level and take the picture.

Advantages :

- Allows person to precisely frame up the picture, focus, and observe depth of field.
- Uses 35mm format
- Allows choice of fast, accurate modes for setting correct exposure. This is possible due to through-the-Iens measurement of subject lighting.
- There is a range of lenses and accessories that can be interchanged .

Disdvantages :

- The photographer cannot see image for the moments in time when the exposure is taking place.
- The camera is electronically and mechanically noisy.
- Most SLRs also rely heavily on battery power to function.
- The range of speed settings for use with flash is limited

Check your progress: 3

Note : Use the space below for your answers.

Compare your answers with those given at end of unit.

Q 1 : Draw the diagram of a TLR or an SLR with correct labeling.

Q 2 : What are the advantages of the TLR ?

Q 3 : Mention the advantages of the SLR over the TLR?

1.5 DIFFERENT TYPES OF CAMERAS

1.5.1 Point and Shoot Cameras

Many people know cameras in their simplest and cost effective models . The most popular one being a point-and-shoot camera or compact camera.

These are cameras which have pre settings, focus free (Auto focus mechanism) , built in flash for low light . They are able to capture moments of life in an easy to shoot way. These cameras donot have interchangleb lenses but sometimes have setting to change frame size to a certain limit. Some may have superzoom option. They are light is weight and small in size.

In the history of photography, the popularity of these cameras cannot be underestimated. Amatuer photography and popularity of photographs as an important family heirloom and document has catapulted the medium to a very commerically viable profession and industry. In the ear before digital cameras, an entire ecosystem of film rolls, camera sales, servicing of camera, processing of pictures and curation of albums was a very profitable and widespread industry.

The Sony cyber shot is one such popular camera. Point-and-shoot camera usage and sales have declined substantially after 2010 with the multi purpose use of smartphones.

1.5.2 Polaroid Cameras

Polaroid cameras are also instant cameras. This means they have a self developing film which is chemically developed and produced minutes within taking the picture. Polaroid Corporation in the USA pioneered consumer-friendly instant cameras and film, and were followed by various other manufacturers. American scientist Edwin Land is credited with the first instant comemrcial camera in 1948.

Check your progress: 4

Note : Use the space below for your answers

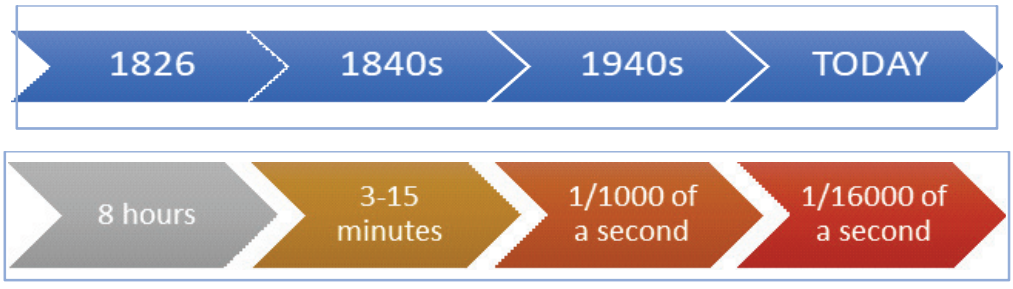
Compare your answers with those given at end of unit.

Q 1 : Define a point and shoot camera and mention two advantages .

Q 2 : What is a poloroid camera ?

A JOURNEY THROUGH TIME

EXPOSURE to LIGHT needed for CREATING IMAGE



1.6 DIGITAL ERA

1970s is the beginning of inventions connected to the digital revolution. A digital camera can be understood as a device for making digital recordings of images. In 1972, Texas Instruments Incorporated in USA is known to have patented the first 'filmless' electronic camera.

The landmark years are :

- 1981 – Sony –commercial electronic model. This model used a "mini" computer disk drive to store information captured from a video camera.
- 1991 –Eastman Kodak began selling digital cameras

DID YOU KNOW?

Kodak developed the first megapixel camera in 1986

It could produce a film-quality 5 × 7-inch (12.5 × 17.5-cm) print.

Difference between Film based cameras and digital cameras :

Unlike film cameras, digital cameras do not work on the principle of light hitting chemical agents coated on film. Digital cameras work on the core part known as a semiconductor device. Commonly referred to as a charge-coupled device (CCD) or a complementary metal-oxide semiconductor (CMOS). A digital camera stores the image as data on a memory card.

These measure intensity of light and colour through the cameras lenses. Pixels or light receptors are an important part of the camera. When light strikes the individual light receptors, or pixels, on the semiconductor, an electric current is induced. Like all digital devices, this is translated into binary digits for storage. A digital camera uses digital optical components to register the intensity and color of light, and converts it into PIXEL data.

Digital cameras also have a a LCD screen (Liquid Crystal display). This is a parallel of the viewfinder in film cameras.

Since the 1990s, digital cameras havegained market share. The nalaog cameras are now a tresure piece in most homes.

Smart telephones and use of cameras within these phones has further revolutionised photography.

A digital camera can store thousands of pictures instead of only up to 36 pictures

1.6.1 Invention of the DSLR

Do you notice that the digital SLR has largely replaced film-based SLR? This change started from 2000s as digital technology entered many domains earlier dominated by analogue. Nowadays, many people shoot videos with a DSLR as well. This indicates the evolution of technology and optics.

Let us begin with the basics on what is a DSLR and the timeline of its invention. It also includes the invention of imaging technology using a digital sensor, called a Charge-Coupled Device (CCD) by Willard S. Boyle and George E. Smith.

A digital single-lens reflex camera (often called DSLR) is a digital camera that has a similar mechanism of the SLR but with a digital imaging sensor.

The reflex design scheme is the primary difference between a DSLR and other digital cameras. In the reflex design, light travels through the lens and then to a mirror that alternates to send the image to either a prism, which shows the image in the viewfinder in SLR, or the image sensor in case of DSLR when the shutter release button is pressed. Remember, the SLR uses the traditional pentaprism and entry-level DSLRs use a pentamirror.

Just like the SLR, the viewfinder of a DSLR presents an image that does not differ substantially from what is captured by the camera's sensor as it presents it as a direct optical view through the main camera lens.

Today, you can also notice another similarity between SLRs and DSLRs is that they both use interchangeable lenses.

In a DSLR, you can choose to focus either on manual or automatic mode. Some of the essential parts of all digital cameras are analog-to-digital converter, image processor, microprocessors for processing the digital image, data storage. Electronic visual display is also an important aspect of the camera.

Timeline for the invention of the DSLR

1969 – Willard S. Boyle and George E. Smith invented the first successful imaging technology using a digital sensor, called a Charge-Coupled Device (CCD). CCD would be the catalyst to the rapid development of digital photography.

1975 – Steven Sasson who worked at Kodak invented the first digital still camera. It used a 100×100 pixel CCD. This camera was the size of a breadbox.

1981 – Sony unveiled a prototype of an analogue electronic camera that featured interchangeable lenses and an SLR viewfinder.

1986 – Japanese company Nikon revealed a prototype for the first DSLR camera

1991 – a commercial DSLR was launched by Kodak

1994 – Kodak and Associated Press launched a digital SLR designed for photojournalists

1995 – Nikon co-developed the Nikon E series with Fujifilm.

1995 – Ricoh developed the first digital camera to have a dedicated movie mode

2000 – Fujifilm launched the first interchangeable-lens DSLR to hit the market.

The commonly known manufacturers of DSLR cameras are Canon, Sony, Nikon, Fujifilm, Panasonic among others.

Check your progress: 5

Note : Use the space below for your answers

Compare your answers with those given at end of unit.

Q 1 : Explain the advantages of the digital cameras?

Q 2 : Define the term Pixel?

Q 3 : Name the person who created the first digital camera?

1.7 LET US SUM UP

Photography is an outcome of the research was conducted through thousands of years by scientists and philosophers on the principles of light and capturing of image.

The major landmark developments, which can be considered, are:

- Preliminary Investigations with chemicals
- Preliminary Investigations with light
- Camera Obscura

Camera Obscura is an important precursor to modern camera. In Latin the term means “dark chamber,” and the earliest versions, consisted of small-darkened rooms with light admitted through a single tiny hole. The result was that an inverted image of the outside scene was cast on the opposite wall. For centuries, the technique was used for viewing eclipses of the Sun without endangering the

eyes. In 1490 Leonardo Da Vinci is known to draw two clear descriptions of the camera obscura.

The process of photography or capturing an image thru the medium of light interacting with a light sensitive material has been a tedious journey of many associated developments initiated by different discoverers, scientists and inventors. Some of these important milestones are discovery of silver salts, silver halides and their interaction with light.

Various experiments were conducted to capture image with exposure to light. These include:

- Heliography
- Daguerreotype
- Calotype process

Various kinds of cameras were invented. The prominent ones being :

- Kodak's film based roll camera
- Twin Lens Reflex cameras
- Single Lens Reflex cameras
- Point and Shoot Cameras
- Polaroid cameras
- Digital Cameras

Today smart telephones have an inbuilt mechanism to click pictures.

1.8 REFERENCES AND FURTHER READINGS

- Langford, M. (2013). Basic photography. Routledge.
- Wright, T. (2016). The photography handbook. Routledge.
- London, B., Stone, J., & Upton, J. (2008). Photography: the essential way. Pearson Prentice Hall.

1.9 CHECK YOUR PROGRESS

Check your progress: 1

1. You can mention anything that is connected to camera obscura.
2. Student can mention two or three scientific developments related to chemicals like Silver salts or halides that are related to developing images or write about the various experiments like Daguerreotype and Calotype.
3. A camera obscura means a dark chamber. In implementation, it implies to a darkened room with a small hole or lens at one side through which an image is projected onto a wall. Scientists and philosophers have popularly used camera obscuras with a lens in the opening since the second half of the 16th century. They were employed as aids for drawing and painting. The concept was the stepping-stone in understanding light to conceiving the initial steps in photography.

Check your progress: 2

1. Student can mention any process like the Daguerreotype, wet plate or the Talbot process.

2. The disadvantage of the Daguerreotype were:

i. Too much time needed for the subject to be still.

ii. Each individual picture was the only version. There was no possibility of producing a duplicate.

iii. The process of developing was hazardous.

3. George Eastman invented the simple box camera Kodak. It was a comparatively simple device. The camera was loaded with film from the company with a 100-exposure roll of film. When the roll was exposed, the entire camera was sent back to the factory in Rochester. The roll was processed and a new roll was reloaded for the customer. The camera was returned to the customer while the first roll was being processed. This made it easier for people to shoot without worrying about developing the film. By 1898, just a decade after this development, over 1,500,000 roll-film cameras had reached the hands of amateur shutterbugs.

Check your progress: 3

1. Students should draw the diagram of a TLR or SLR with labeling.

2. Advantages of TLR :

- Quiet cameras
- Viewfinder image matches image size of film
- Viewfinder does not go black when exposing
- Uses leaf shutters which can sync with a flash at any speed

3. Advantages of the SLR over the TLR :

- Allows person to precisely frame up the picture, focus, and observe depth of field.
- This was not possible in the TLR
- Uses 35mm format
- TLR uses large format. Not easy for all to use
- Allows choice of fast, accurate modes for setting correct exposure. This is possible due to through-the-Iens measurement of subject lighting.
- Allows more possibilities than the TLR
- There is a range of lenses and accessories that can be interchanged .
- This was a bottleneck in TLR hence the SLR has advantage

Check your progress: 4

1. These are cameras which have pre settings, focus free (Auto focus mechanism) , built in flash for low light . They are able to capture moments of life in an easy to shoot way. These cameras donot have

interchangleb lenses but sometimes have setting to change frame size to a certain limit. Some may have superzoom option. They are light is weight and small in size.

2. It is known as instant camera.

Check your progress: 5

1. Unlike film cameras, digital cameras do not work on the principle of light hitting chemical agents coated on film. Digital cameras work on the core part known as a semiconductor device. Commonly referred to as a charge-coupled device (CCD) or a complementary metal-oxide semiconductor (CMOS). A digital camera stores the image as data on a memory card.

   These measure intensity of light and colour through the cameras lenses. Pixels or light receptors are an important part of the camera. When light strikes the individual light receptors, or pixels, on the semiconductor, an electric current is induced. Like all digital devices, this is translated into binary digits for storage. A digital camera uses digital optical components to register the intensity and color of light, and converts it into PIXEL data.

   Digital cameras also have a LCD screen (Liquid Crystal display). This is a parallel of the viewfinder in film cameras.

2. A pixel is the smallest unit of a digital image that can be displayed and represented on a digital display device. It is the basic logical unit in digital. Pixels combine to form a complete image. It is also known as a picture element.

3. Steven Sasson who worked at Kodak invented the first digital still camera. It used a 100×100 pixel CCD.

UNIT 2: CAMERA - TYPES, STRUCTURE AND FUNCTIONS

Structure

2.0 Introduction

2.1 Learning Outcomes

2.2 What is a Camera?

2.3 Types of Digital Camera

- 2.3.1 Point and Shoot cameras
- 2.3.2 DSLR cameras
- 2.3.3 Mirrorless Cameras

2.4 Structure of a Camera

- 2.4.1 Lens
- 2.4.2 Body

2.5 Functions of a Camera

- 2.5.1 Functioning of DSLR Camera
- 2.5.2 How to Hold a Camera
- 2.5.3 Focus
- 2.5.4 Different Shooting Modes
- 2.5.5 White Balance
- 2.5.6 ISO

2.6 Camera Accessories

- 2.6.1 Tripod
- 2.6.2 Filters
- 2.6.3 Flash

2.7 Let Us Sum Up

2.8 Key Words

2.9 Further Readings

2.10 Check Your Progress: Possible Answers

2.0 INTRODUCTION

The word Photography has Greek roots, broken down to ‘Photo’ + ‘Graphe’, which roughly means writing or drawing by light. Camera is nothing but a tool that enables writing with the help of light. This unit will help you to learn about the basic principles of photography. What exactly happens inside a camera and how the image is formed ? We shall also cover various types of digital cameras used for still photography while exploring the pros and cons of each type. We will also learn about the functioning of a DSLR camera, the working of its various controls and analyse how they affect the image. In the end, we shall go through a number of camera accessories and understand their use and purpose in still photography.

2.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- describe the different types of still camera;
- identify various parts of a still camera;
- explain the working of a still camera; and
- know the different accessories used with still cameras.

2.2 WHAT IS A CAMERA?

Photography seems like a pretty simple hobby to take up. Everyone has become a photographer in recent times with smartphones equipped with cameras of great megapixels. But photography dates back to times when one photograph took hours to be exposed and one had to wait for days for developing of a photograph. You may remember the times when cameras were loaded with film rolls, which contained a total of 36 frames. These 36 frames were exposed very selectively, sent to the chemical labs for processing and then after a week-long wait, the photographs arrived along with the negatives. Compared to that, today one is able to click ten photos of themselves even before exiting the house. And processing is far forgotten as all the display and archival happens on social media instead of photo albums.

The word camera originally is derived from the Greek word ‘Kamara’, meaning a dark room. It is a shortened version of the ‘Camera Obscura’, which was a light proof tent, allowing light to enter through an opening fitted with a lens. The lens was used to collect and converge light to a point, just like it happens in case of a magnifying mirror. Artists sitting inside the room used to trace the image created by light falling onto a flat surface. This flat surface was later on replaced by materials coated with photosensitive chemicals, that allowed certain chemical reactions to take place, triggered by the light. The bases for these materials started with broad sheets of glass to tiny 35 mm films, thus reducing the size and mobility of the cameras in use as well.

Today, with the advent of digital technology, photography has also evolved rapidly over the past three decades. A digital camera utilizes the same optical principles as a film camera, aided with a small photosensitive chip that has replaced the film. So while the chip converts the light energy into electric signals, another chip, or memory card stores these signals in form of digital data. This data can then be touched upon in our computers, mobile phones, etc. and shared over the Internet across social media and also be printed and pasted in photo albums like that of yesteryears. You may have taken a selfie, uploaded it to your social media account and gathered feedback from your peers on your photography skills. Digital cameras have made the process of photography simpler. We shall discuss the working of a digital camera in detail further in this unit.

2.3 TYPES OF DIGITAL CAMERA

There are many types of digital cameras available in the market. They may be categorized differently based on their working.

2.3.1 Point and Shoot cameras

The simplest type is a point and shoot camera. Its name aptly describes its use. You point at the image to be clicked, and just click the button to shoot it. While easy to use, it does not need the photographer to think about any other controls other than putting what is to be photographed in front of the camera. The camera does all the calculation and adjustment on its own for capturing the image. It is good for people who do not have any artistic or professional inclination towards learning photography. Due to less knowledge and skills required to operate it, the major market share today is occupied by these cameras. The camera of your smartphone also lies in this category, but depending on the model and budget of the phone, it may offer you certain customizations for the image.

Figure 1: Point and Shoot Camera

Point and shoot cameras are compact and light weight, easy to handle and can capture video as well. These cameras have separate mechanisms and lenses for capturing and viewing the image. The lens allows the light in to capture the image while the viewfinder allows the light in for the eye to view and compose the frame. Due to the difference in the position of the two lenses, parallax error occurs while shooting. Parallax error occurs when there is a difference between the conceptualized frame and the captured frame due to the position of the two lenses.

Image source: No machine-readable author provided. Marb~commonswiki assumed (based on copyright claims). / CC BY-SA (http://creativecommons.org/licenses/by-sa/3.0/)

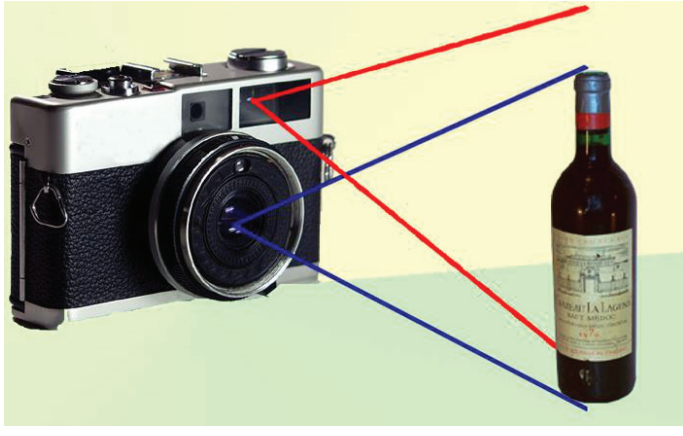


Figure 2: Parallax error

2.3.2 DSLR cameras

DSLR stands for Digital Single Lens Reflex cameras. They are named so as they have single lens for viewing and capturing the image. DSLRs have larger sensors than average point and shoot cameras, thus resulting in better image quality. DSLRs also provide a lot of control over the image by allowing to change lenses, altering aperture, shutter, ISO and many other functions as well that we shall discuss later in the chapter.

These cameras have ruled the market for the longest time due to their practicality of functioning and amount of control they offer to the photographer over the image. Variations in models are also available depending upon the use. Consumer end cameras would provide lesser specifications, while prosumer end may provide an array of functions. DSLRs also allow for video recording, but control may vary depending on the budget and the model of the camera. Few higher end cameras also allow for sound recording with the help of attachable devices. Stanley Ka Dabba (2011) was the first film in India to be completely shot on DSLRs.

Figure 3: DSLR Camera

2.3.3 Mirrorless Cameras

DSLRs have a small reflex mirror housed inside the body of the camera that functions to remove the parallax error as faced by the point and shoot cameras. Further improving upon the design of the DSLRs, mirrorless cameras work on a digital display system rather than an optical one. Simply put, in the absence of the reflex mirror, the image sensor supplements the viewfinder with the signal it is receiving. So the photographer is able to see the image live on a small LCD screen at the back of the camera. All the controls and functions can be accessed through this screen and there is no need of using a viewfinder at all.

Compared to DSLRs, these cameras are smaller, lighter and quieter as the mirror is removed, which moves when shutter is released. Unlike the DSLR cameras these cameras also give a live feedback of depth of field and exposure on the viewing screen. Slowly and steadily gaining the market share, mirrorless cameras are replacing the DSLRs.

Figure 4: Mirrorless Cameras

Image source: Yitech / CC BY-SA (https://creativecommons.org/licenses/by-sa/4.0)

Check Your Progress : 1

Note: 1) Use the space below for you answers.

2) Compare your answers with those given at the end of this unit.

1. What is parallax error?

_____

_____

_____

_____

2. How is a DSLR camera different from a point and shoot camera?

_____

_____

_____

_____

3. The film, Stanley Ka Dabba (2011) was completely shot on DSLR.

   a. True

   b. False

4. Mirrorless cameras are lighter than the DSLR cameras.

   a. True

   b. False

5. In which of the following does Parallax error occur ?

   a. SLR

   b. DSLR

c. Point and Shoot camera

d. None of the above

2.4 STRUCTURE OF A CAMERA

You may remember that at the beginning of this chapter, it was discussed that a camera is a light tight box, allowing the light to enter by measure, in order to capture a framed image. Now we will dissect and discuss the structure of a digital camera. A camera can be divided into two main parts: lens and body. These two main parts are made up of many other subparts. Now we shall discuss these parts in detail.

Photo: Poonam Gaur

Figure 5: Parts of camera: lens and body

2.4.1 Lens

A lens is a finely polished glass, curved on both sides, used to allow light to enter the camera and focus the image on the sensor. A photography lens is usually an assembly of lenses that are adjusted in order to achieve the desired image. Better the lens of a camera, better the photographs being captured. Now, we shall discuss different types of photographic lenses.

Types of Photographic Lenses

Photographic lenses are categorized on the basis of their focal lengths. Focal length of a lens is the distance between its optical centre to the focal point. In a camera, the sensor is placed at the focal point of the lens in order to expose for the image. You may remember from your high school physics that if the object is at infinity, the image will be created on the focal point. Focal length affects the angle of view of a lens as well. Lesser the focal length, more the angle of view. Lenses which are closer to the angle of view of human eyes are called normal lenses. Their focal length is approximately 50-55 mm for 35 mm photography sensors. All perspectives, sizes and distances are seen through these lenses as seen by human eyes. Lenses with focal length lesser than this would have a greater angle of view, thus are called wide angle lenses, for e.g., 24 mm, 30 mm lenses. Going too wide starts distorting the image. One may see the edges distorting in photographs taken by 16 mm or lower lenses. These lenses have smaller lens body. On the other hand, telephoto lenses have a narrower field of vision and a longer lens body. For 35 mm sensors, telephoto lenses begin from

75 mm and go up to 250-300 mm. There are super telephoto lenses as well, with 1000 mm focal length.

Image source: https://pixabay.com/photos/telephoto-lens-canon-photography-1279897/

Figure 6: Telephoto Zoom lens

Lenses with fixed focal length are called prime lenses, while lenses with variable focal length are called zoom lenses. Zoom lenses allow for optical magnification by narrowing down the angle of view, and thus provide for greater flexibility for framing the image without the movement of the photographer.

Other Parts of Photographic Lenses

When you carefully inspect the photographic lens, you will find many different parts. These are - focusing ring, manual / auto focus switch, zoom ring, aperture, image stabilization switch, and lens cap. Here we shall discuss about these parts briefly.

- Focusing ring: You may have noticed the focussing ring on the camera, which is the first ring on any camera lens. This ring is used to focus the image in manual focus mode. In auto focus mode, the ring gets locked.
- Manual / Auto focus switch: You can find this switch on the lens which allows you to choose between manual focus and auto focus.
- Zoom ring: Zoom ring is the another ring found on camera lens. It help to change the focal length of the lens and get the effects of zooming.
- Aperture: Aperture is the opening in the camera through which light enters. It works like the pupil of the eye, contracting in more light and enlarging in low light conditions. Similarly, greater the opening in the camera, more light entering and falling onto the sensor and greater chances of overexposing the image. On the other hand, smaller the opening, lesser the light and thus chances of underexposing the image.

Thus, choosing the appropriate aperture is extremely important for the photograph. We shall discuss about aperture in detail in Unit-7 (Photography Techniques).

- Image stabilization switch: You can find this switch on many lenses. This allows you to take advantage of the image stabilization feature which helps in reducing the effects of camera shake and get sharper photos.
- Lens cap: This is a protective cover of the camera lens that protects the lens from scratches and minor collisions.

6.4.2 Body

The body of the camera is designed in such a manner that no light, other than the intended light, comes into it. It is also entirely black as to disallow any sort of reflection within. In a DSLR camera, after the removal of the lens, you can see the reflex mirror and the sensor when one presses the shutter release button. The shutter is located in front of the sensor, which shifts to expose the sensor to light to form the image. The body also contains a lot of circuitry which enables the working of the camera. At the back, one can see the LCD screen with a viewfinder mounted on the top. The LCD screen helps in seeing the live view of the frame being captured and also the other adjustments that can be manoeuvred within the camera. The body of a DSLR camera consists of many other important parts. Now, we shall discuss about them in detail.

Image Sensor: The light falls onto the sensor in the camera, which is nothing but an electronic chip, which converts light energy into electric energy. It is of the same size as that of a 35 mm film in full frame DSLR cameras but many DSLR and mirrorless cameras are available with smaller sensors too. The quality of a sensor is measured by how many pixels it has and its size. A pixel is a picture element; a unit in the sensor which enables conversion of light energy into electric energy. Greater the number of pixels in a sensor, greater the data collected and converted into electric signals, thus better the resolution of the photograph. Today the market of digital cameras sees them being marketed on the basis of the number of their pixels, or Megapixels. A megapixel is equivalent to 1 million pixels. Even the smartphone cameras today are competing with DSLR with the help of attachable lenses and better sensors. Mainly two types of camera sensors are used – CCD (Charge-coupled Device) and CMOS(Complementary Metal-oxide Semiconductor) . CMOS is cost-effective and now matches the quality of the CCD. Nowadays CMOS sensor is getting more popularity.

Viewfinder: Viewfinder of a camera is on the top at the back. In DSLR camera, it helps in viewing the image being focussed with the help of the reflex mirror and pentaprism. You can also customize the viewfinder's lens according to the power of your eyesight. This is done by customizing the dioptre settings, accessing through a dial on the viewfinder itself.

Shutter: While aperture controls the amount of the light entering, shutter is the device which controls the time period it is allowed to fall onto the sensor. Like an actual shutter, it opens and shuts for a defined time period in order to let the exposure take place. Shutter speed is the time for which the shutter is held open. Lesser the time taken, faster the shutter speed and conversely more the time taken, slower the shutter speed. Shutter plays very important role

in photography. We shall discuss about it in detail in Unit-8 (Techniques of Photography).

Check Your Progress : 2

Note: 1) Use the space below for you answers.

2) Compare your answers with those given at the end of this unit.

1. What is normal lens ?

_____

_____

_____

_____

2. Discuss the difference between prime and zoom lens.

_____

_____

_____

_____

3. Telephoto lenses have a narrower field of view.
   a. True
   b. False
4. Lenses with fixed focal length are called prime lenses.
   a. True
   b. False
5. CMOS stands for _____.
   a. Camera Magnet Operated Sensor
   b. Complementary Metal-oxide Semiconductor
   c. Camera Minor Optical Sensor
   d. Complementary Magnetic Optical Semiconductor

2.5 FUNCTIONS OF A CAMERA

With a brief understanding of various parts of the camera, we may proceed further to discuss how these parts work together in tandem for its smooth functioning. In this section, we shall discuss the functioning of a still camera, especially a DSLR camera. However, most of these functions are similar between DSLR and mirrorless cameras.

2.5.1 Functioning of DSLR Camera

Here is a cross section of a DSLR camera given, to make you understand and trace the path of light inside a camera.

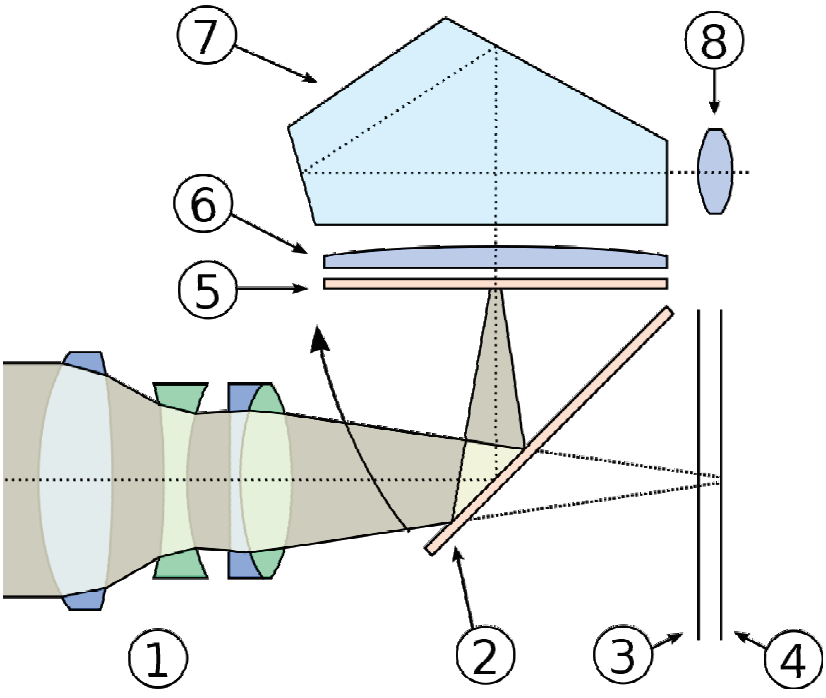


Image source: By en:User:Cburnett - Own work with Inkscape based on Image:Slr-cross-section.png, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=1588769

Figure 7: Cross Section of a DSLR

1- Camera lens, 2 – Reflex mirror, 3 - Focal-plane shutter, 4 - Image sensor, 5 – Matte focusing screen, 6 – Condenser lens, 7 - Pentaprism and 8 - Viewfinder eyepiece

When you look through the viewfinder of an SLR, you are actually seeing a reflection of the image created by the reflex mirror and the pentaprism housed in the viewfinder. The mirror sends the light upwards and the pentaprism reflects it within to rotate the image and sends it to the viewfinder to help compose the image. When the shutter release button is pressed, the mirror swiftly moves upwards, allowing the light to fall onto the sensor to create the image. After the image is captured, the mirror falls back into the place again. As the action of mirror is based on the pressing of a button, it is called a reflex mirror.

While the DSLR is a marked improvement on the earlier point and shoot cameras, following are the few disadvantages of a DSLR:

i. They are heavy and bulky to carry.

ii. The viewfinder goes blank when the photograph is being taken, thus the photographer loses the control over the image.

iii. The movement of the reflex mirror may shake the camera.

iv. Time lag due to the movement of mirror.

These factors have been discounted in the mirrorless cameras, leading to their rapidly gaining popularity in this market segment.

2.5.2 How to Hold a Camera

It is also necessary to know how to hold the camera during photography. If we do not hold the camera correctly then there is a possibility of bad photographs. The stability of the camera is most important in this case. Camera shake may spoil the photograph specially in slow shutter speed. So, we should hold the

camera in such a way that it remains maximally stable. In this process, it is necessary for the body to remain balanced and stable. You should hold the camera by placing the body horizontally on the left palm, to provide it stability and steadiness. Right hand is used to hold the camera while the fingers and the thumb remain free to function the buttons according to the need to capture the image. Hold it tight against the forehead.

Figure 8: How to hold a camera

2.5.3 Focus

You may have noticed the focussing ring on the camera, which is the first ring on any camera lens. It helps in moving the camera assembly so that the image produced can be brought into sharp focus. While working in manual focussing mode, one rotates the ring in order to focus in or out of the subject as per the need. It also helps in highlighting one part of the image by focussing it sharper than the rest. In autofocus mode, the ring gets locked and the camera detects the object by using infrared wave mechanism and shoots accordingly. Half pressing the shutter release button helps in measuring and locking the focussing distance.

2.5.4 Different Shooting Modes

You will get different shooting modes in your camera. These modes can be automatic, semi-automatic or complete manual. Here, we shall discuss few important shooting modes.

Auto mode: In this mode, the camera sets everything automatically. You cannot change aperture, shutter speed, or ISO. Most cameras provide some pre-programmed settings, for example - portrait mode, landscape mode, close-up mode, sports mode, etc. In these modes the camera automatically sets all the features. In the beginning, you can use automatic pre-programmed modes.

Aperture-Priority Mode: You may consider this mode as semi-automatic where you have the freedom to set a few things and some other things will be set automatically by the camera. In aperture priority mode, you have the liberty to change the aperture and ISO and the camera will automatically select the shutter speed to get the correct exposure. Different companies use different icons for this mode, but 'A' and 'Av' are the most popular.

Shutter-Priority Mode: It is also a semi-automatic mode where you have freedom to choose shutter speed and ISO and the camera will automatically select the aperture accordingly. 'S' and 'Tv' are the most popular icons used for this mode by different camera companies.

Manual Mode: It is a complete manual mode where you have the freedom to set all the features of the camera according to your need. This mode gives you complete control over the camera settings. You can set aperture, shutter speed and ISO according to your requirement.

2.5.5 White Balance

White balance is basically the process of telling the camera what is white in a given light. A white sheet of paper will remain white to you even if the light conditions in your room change from sun light to tube light. This is because your brain is always on auto white balance and identifies the white colour. Why is white important? Because it is a mixture of all colours and identifying it will help in truly identifying all the colours.

The camera is not as advanced as your brain. It needs to be specifically told in each light condition what is the true white, in order to capture and recreate all the colours truthfully. Have you noticed photographs which have a green, blue or orange cast to them. That is all the colours appear to be overpowered by a single colour and thus appear as various shades and tones of it. That is due to incorrect white balance.

A DSLR has a list of pre-sets which helps the photographer choose what lighting conditions he/she is shooting in, and thus define white for that particular light. It ranges from incandescent, fluorescent, direct sunlight, flash, cloudy and shade amongst others. Camera can also be put on auto white balance which makes it one less thing to think about but white balance does help in true reproduction of colours in any photograph.

2.5.6 ISO

In digital photography, ISO is related to the sensitivity of the image sensor to light. You shall find the ISO button on the body of the camera, through which the ISO setting can be changed. If you increase the ISO, the image sensor's sensitivity to light will increase. This is a useful feature in photography and we will discuss it in detail in Unit-7 (Photography Techniques).

2.6 CAMERA ACCESSORIES

Camera accessories make photography more effective and smooth. In this section, we will discuss some important camera accessories useful in photography.

2.6.1 Tripod

A tripod is an extendable three legged stand for mounting the camera. Its primary function is to keep the camera steady and stable at a position. It is required for long exposures and in case of multiple photographs required from same position. A tripod has two basic parts, the head and the legs. The legs are collapsible and extendable to the desired height and the head has a pan and tilt head, helping in panning, tilting and rotating the camera after it is steadily mounted.

Image source : https://www.publicdomainpictures.net/en/view-image.php?image=170603&picture=tripod

Image source: No machine-readable author provided. Kapege.de assumed (based on copyright claims). / CC BY-SA (https://creativecommons.org/licenses/by-sa/2.5)

Figure 9: Tripod and Monopod

Another variation is monopod, which is a one legged stand. So while it provides stability and steadiness, it needs to be held by the photographer all the time.

2.6.2 Filters

Filters are pieces of glass attached to lenses to help filter light waves entering into the lens. Filters also safeguard the lens from dust, sunlight and scratches. Filters help in controlling the colour, contrast, tonality, glare of the photograph along with creating a few special effects. For e.g., Neutral Density filters help in cutting down the light, colour correction filters help in changing the white balance, Star filters help in creating star effect in the photograph, UV filters filter out UV rays from entering the camera and the fog filters help creating a foggy effect in the photographs.

Image source: Ashley Pomeroy / CC BY (https://creativecommons.org/licenses/by/3.0)

Figure 10: Types of Filters

2.6.3 Flash

Flash is a device which emits light for a brief instant. It is the most commonly used artificial lighting equipment used for still photography. Many cameras have an inbuilt flash. While shooting in flash mode, it goes on as soon as the shutter release button is pressed to provide light for the photograph. External flashes have to be synchronized with the camera, with the use of a trigger cable or a wireless trigger.

Image source: Redline / CC BY-SA (http://creativecommons.org/licenses/by-sa/3.0/)

Figure 11: External Flash

Check Your Progress : 3

Note: 1) Use the space below for you answers.

2) Compare your answers with those given at the end of this unit.

1. Discuss the difference between manual focus and autofocus ?

_____

_____

_____

_____

2. What is White Balance? How does it affect the image ?

_____

_____

_____

_____

3. In DSLR camera, the viewfinder goes blank while the photograph is being taken.

   a. True

   b. False

4. Monopod has three legs.

   a. True

   b. False

5. In photography, ISO is directly related to _____.

   a. Speed of shutter

   b. Size of aperture

   c. Sensitivity of image sensor to light

   d. Focal length of the lens

2.7 LET US SUM UP

To be a good photographer you must know your camera well. In this unit, you were introduced to digital still cameras. We discussed the structure of camera in detail. We discussed variations in designs of still cameras and their working. We also learnt about the various functions one needs to control while capturing a photograph and how each control would affect the photograph. Finally, we talked about a few accessories that help in still photography.

2.8 KEY WORDS

- **Lens:** a light-bending optical device fitted in front of a camera to focus light coming from subjects at various distances on to the image sensor's surface.
- **Viewfinder:** a system or a window for aiming the camera that will also allow image composition.
- **Aperture:** a mechanical device that adjusts the size of the hole or a diaphragm so more or less light can pass through it.
- **Shutter:** a light-blocking gate that can be opened to let light reach the image sensor for a predetermined and very precise time and then shut to keep light away from the sensor.
- **Focussing ring:** This is the adjustment that we use to bring the subject into sharp focus. It is usually on the lens and has a scale that shows the distance of the subject from the lens. By moving the ring clockwise or anticlockwise we adjust the focus. Most new cameras also have an

automatic focussing mechanism and such cameras are also referred to as autofocus cameras.

- **Pentaprism:** A multi sided (five) glass prism housed on the roof of an single-lens reflex camera so that the image that is seen in the lens can be viewed through an optical viewfinder above the lens. The light enters through the lens is reflected up by a reflex mirror to the prism and across to the eye.

2.9 FURTHER READINGS

Langford Michael, Langford's Basic Photography, Focal Press, London

Sharma O.P, Practical Photography, Hind Pocket Books, New Delhi

Präkel, D., 2009. Basics Photography 07: Exposure. AVA Publishing.

DK, 2016. Beginner's Photography Guide. Penguin Random House.

2.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress: 1

1. Parallax error occurs when there is a difference between the conceptualized or viewed frame and the captured frame due to the position of the two lenses.

2. The point and shoot camera is the simplest camera. Its name rightly describes its use. You point at the image to be clicked, and just click the button to shoot it. While easy to use, it does not need the photographer to think about any controls other than putting what is to be photographed in front of the camera. On the other hand, DSLR cameras are more complex and provides a lot of controls to the photographer. DSLR stands for Digital Single Lens Reflex cameras. They are called so as they have single lens for viewing and capturing the image. DSLRs have larger sensors than average point and shoot cameras, thus resulting in better image quality. DSLRs also provide a lot of control over the image by allowing to change lenses, altering aperture, shutter, ISO and many other functions as well.

3. a. True

4. a. True

5. c. Point and Shoot camera

Check Your Progress: 2

1. Lenses which are closer to the angle of view of human eyes are called normal lenses. Their focal length is approximately 50-55 mm for 35 mm photography sensors. All perspectives, sizes and distances are seen through these lenses as seen by human eyes.

2. Lenses with fixed focal length are called prime lenses, while lenses with variable focal length are called zoom lenses. Zoom lenses allow for an optical magnification by narrowing down the angle of view, and

thus provide for greater flexibility for framing the image without the movement of the photographer.

3. a. True

4. a. True

5. b. Complementary Metal-oxide Semiconductor

Check Your Progress: 3

1. In manual focussing mode, we rotate the focus ring in order to focus in or out of the subject as per the need. It also helps in highlighting one part of the image by focussing it sharper than the rest. In autofocus mode, the ring gets locked and the camera detects for the object by using infrared wave mechanism and shoots accordingly. Half pressing the shutter release button helps in measuring and locking the focussing distance.

2. White balance is the process of referencing the colour white in the given light for the camera. This helps in reproducing all the colours truthfully as white colour is made up of all the colours. It also helps in removing any colour cast from the image.

3. a. True

4. b. False

5. c. Sensitivity of image sensor to light

UNIT 3: LIGHTING TECHNIQUES - I

Structure

3.0 Introduction

3.1 Learning Outcomes

3.2 Light and Lighting

3.2.1 Importance of Lighting

3.3 Characteristics of Light

3.3.1 Intensity or Quantity

3.3.2 Character or Quality

3.3.3 Colour Temperature

3.4 Fundamentals of Lighting

3.4.1 Sources of Light

3.4.2 Direction of Light

3.4.3 Lighting Ratio

3.5 Basic Lighting Techniques

3.5.1 Three-point Lighting

3.5.2 Four-point Lighting

3.5.3 Flash Photography

3.6 Let Us Sum Up

3.7 References and Further Reading

3.8 Check Your Progress: Possible Answers

3.0 INTRODUCTION

Without light this whole world would be dark. Neither we nor the camera can see this world without it. Whether it is photography or video production or filmmaking, nothing is possible without light. Light is extremely important for all of them. You must have often heard three words in the context of video or film production - light, camera and action. Here too, the light comes first because the camera cannot record action without the light. The word photography simply means drawing with light. Earlier, film was used in still cameras. The film was a light sensitive strip on which light signals were recorded. Similar films were also used in motion picture. Later, instead of film, image sensors came in place, but these image sensors also record only light signals and then convert these light signals into electronic signals. Therefore, in photography, film making and video production, everywhere cameras record the light signals only. In addition to illuminating the objects of the frame, light also plays many other roles. It is an important tool for visual storytelling.

Using light in a planned manner to produce the desired effects is called lighting. Lighting the same subject in different ways can produce different meanings and effects. It was quite difficult to cover all aspects of lighting for photography and television production in one unit, so we have devoted two units to this topic. In this first unit on lighting, we shall discuss some aspects and rest will be discussed in unit-11.

3.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- discuss the importance of lighting in photography and television production;
- explain the different characteristics of light; and
- describe the basic lighting techniques.

3.2 LIGHT AND LIGHTING

Light is a natural agent (electromagnetic wave) that stimulates sight and makes things visible.

It is a portion in the electromagnetic spectrum that is visible to human eye. Its wavelengths range from around 380 to 750 nanometres (Figure - 1). It lies between the infrared and ultra violet range of the spectrum. Lighting on the other hand is the planned and calculated use of light to capture visuals with desired effect (level of illumination or shadow).

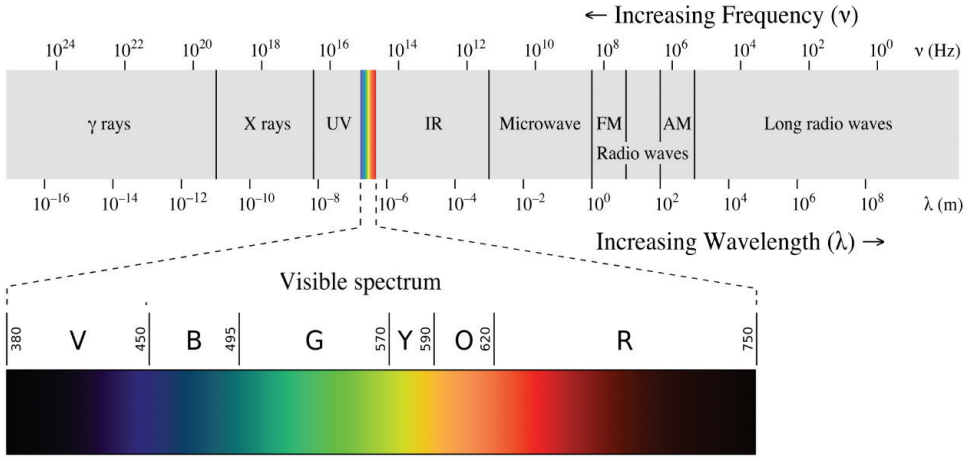


Figure 1: Electromagnetic spectrum

Image Source: Philip Ronan, Gringer / CC BY-SA (https://creativecommons.org/licenses/by-sa/3.0), https://upload.wikimedia.org/wikipedia/commons/3/30/EM_spectrumrevised.png

3.2.1 Importance of Lighting

As we have discussed earlier, we cannot even imagine the existence of photography, videography or cinematography without light. It is the backbone of photography or television production. As a photographer or television professional, we use planned and calculated light so that we can get the desired results. This is called lighting. In photography or television production the importance of lighting can be classified into two following types:

1. Meeting the technical requirement of the cameras
2. Aesthetic requirements

1. Meeting the technical requirement of the cameras: Just like our eyes cannot see without light, similarly the camera also does not see anything without light. Therefore, it is necessary that there is sufficient light in

order for the camera to record visuals. Every camera needs a minimum light to work optimally. Therefore, the first objective of lighting is to provide the appropriate light for the camera so that it can record the visuals correctly.

2. Aesthetic requirements: Lighting is an important tool for visual storytelling. It creates meaning. With the help of lighting, we can set the mood of a scene, highlight certain things in the frame, likewise hide certain things or reduce their importance in the composition, and can present the personality of a character in a particular way. If your scene is positive and cheerful, you have to light it in a certain way, but if the scene is full of sadness, you will light it differently. Lighting also plays an important role in making scenes scary. Lighting the same room in different ways can produce different meanings. If your lighting does not suit the mood of the scene, it will create confusion in the audience's mind and you will not be able to tell your story in a smooth and effective manner.

3.3 CHARACTERISTICS OF LIGHT

Light has some characteristics that are frequently used in photography or television/film production. As a student of electronic media, you should understand these characteristics. In this section, we shall discuss these characteristics in detail.

3.3.1 Light Intensity or Quantity

In simple words, light intensity is the available amount of light on a given surface. It refers to the quantity of the light. In photography or television production, it is very important to know how much light is falling on subject/s. A minimum light intensity is required for any camera to be able to record optimally. If that minimum amount of light is not available, camera will not function properly. The technology of cameras is constantly improving. Newer modern cameras are doing better at relatively low light intensity than older cameras. This has also benefited artists working in television. Earlier, in order to meet the technical requirement of the camera, a lot of light intensity was required, due to which TV actors or presenters had to face lights with high intensity. These lights used to produce a lot of heat also. But now the technology of camera has improved significantly.

Professionals use light meters to measure the light intensity accurately. The unit of light intensity is Lux (lx) and Footcandle (fc). The light intensity can be measured for the two following different types of lights :

i. Incident Light

ii. Reflected Light

i. Incident Light: The incident light is the light that falls directly on the subject. It is different from the reflected light. The intensity of incident light depends upon the brightness of the light source. This light can be easily measured by standing next to the subject by using a light meter pointing it towards the camera lens. This reading of light metre provides us an accurate measurement of the overall light amount that reaches a specific area.

ii. Reflected Light: As the name itself suggests, it is the light reaching the camera lens, reflected from the surface of the subject. The reflected light gives you a perfect idea of how much light is bounced off the various subjects and reaches the camera lens. Generally it is used to measure contrast. The intensity of reflected light depends upon two things. First, brightness of the light source and second nature of the objects' surface. Two different types of surfaces will reflect the same amount of light differently. Suppose you are taking a shot of a drawing room. There is a show piece with shiny surface near the couch. If you are putting equal light over that area, the reading for incident light intensity will come same because both the show piece and the couch receive the same amount of light. But when we measure intensity of reflected light, it will be more for the show piece because the show piece is reflecting more light due to its shiny surface, and camera lenses receive more light reflected from the show piece. Reflected light intensity can also be measured with specialized light meters placed near the camera pointing it closely to the subject. The figure (2) explains the difference between incident light and reflected light.

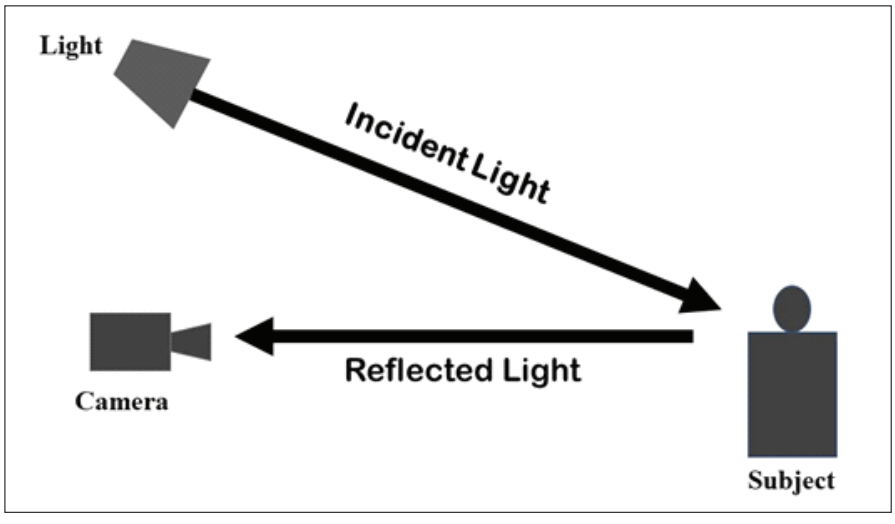


Image Source: Amit Kumar

Figure 2: Incident Light and Reflected Light

Controlling Light Intensity: In photography or television production, you need to control the light intensity according to your requirement. The light intensity can be controlled in many ways. First, you can change the lamp. Suppose you are working with 300W lamp and you need almost half light intensity. Then you can change the lamp and work with 150W lamp. Second, you can use dimmers also. With the help of dimmer, you can decrease or increase the intensity of the light according to your need. Third, you can change the light intensity by changing the distance between the light source and the illuminated subject. If you bring the light source closer to the subject, the light intensity will increase and vice versa. The camera also has many controls to manipulate the light intensity.

3.3.2 Light Character or Quality

The second important characteristic of light is its quality or character. It is basically its hardness or softness. On this basis, light can be divided into two main categories – Hard light and Soft light.

i. Hard Light: The hard light casts hard edged and well defined shadows with clear border. Small and distant light sources produce hard light. It means, two factors affect the hardness and softness of light. First is size of the light source relative to the subject, and second, distance between light source and the subject. The relationship can be understand as - smaller the light source, harder the light and farther the light source, harder the light. The shadows of these lights are harsh and create deep contrast pictures. Few common examples of the hard light sources are sun (excluding morning, evening and cloudy day), flashlight, etc. Now a question arises that the Sun is very big but still gives hard light, why ? It is true that the Sun is very large but it is far away, so we see it quite small. The size of the Sun relative to us is small. That is why it produces hard light. While hitting a textured surface at an angle, hard light highlights the textures and shows more details in an object.

ii. Soft Light: The soft light cast soft edged shadows. Soft lights are diffused and create even distribution of colour tones and fewer shadows resulting in low contrast in the picture. You can find this type of light during cloudy days as the light from the Sun gets diffused passing through the clouds. The light then gets evenly distributed avoiding harshness. In artificial lighting, diffusers and papers are used to diffuse the light manually to get the even tone. As we have discussed above, the size of the light source relative to the subject and distance between light source and subject determine the hardness and softness of the light. Here the relationship is – larger the light source, softer the light and closer the light source, softer the light. The following figure (3) explains the difference between hard light and soft light.

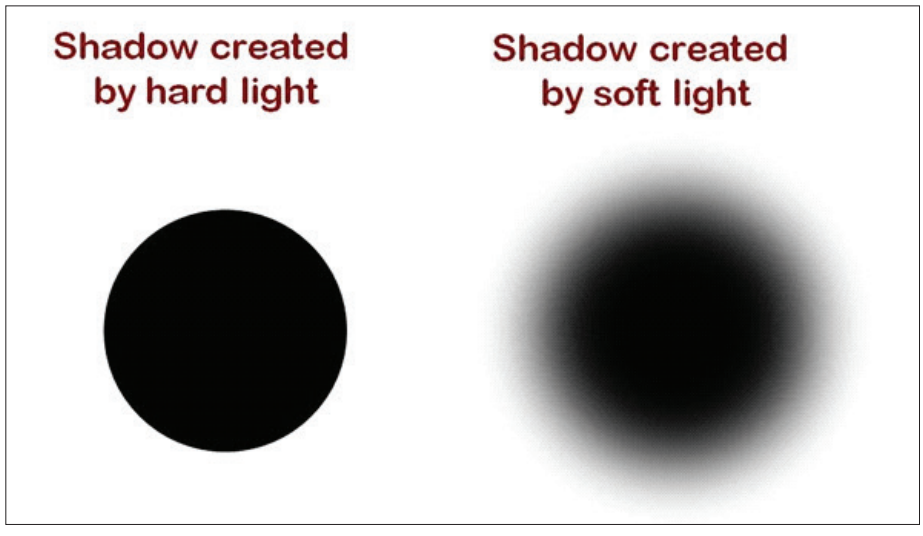


Image Source: Amit Kumar

Figure 3: Shadows created by hard and soft light

3.3.3 Colour Temperature

The third important characteristic of light is colour temperature. When we heat a black body at high temperature, its colour also changes as the temperature increases, from reddish-orange to bluish-white. At different temperatures it radiates different colours, and that temperature is called colour temperature of that particular colour. Colour temperature is the variation of colour tinge of the light sources such as candles, tungsten light bulb, fluorescent tube, midday

sun, etc. You should not be confused with the physical temperatures of the light filaments and tubes.

Generally, higher the colour temperature, the bluer it is, and the lower the colour temperature, the redder it is. The colour temperature is measured in degrees Kelvin (K). The standard colour temperature for indoor lighting is 3200 K and for outdoor it goes up to 5600K. As colour temperature increases the light's appearance moves from the colours, red, orange, yellow, white and bluish white consecutively. The Sun is a single light source but it changes its colour at the different times of the day. Here, we shall see colour temperatures of few light sources. For example, candle flame – 1800K, Sunrise/Sunset - 2500K, tungsten halogen – 3200K, early morning or evening sunlight – 3500K, noon sunlight – 5600K, overcast sky – 6500K, etc.

Colours with colour temperatures beyond 5000K are considered as cool colours whereas colours with lower colour temperatures ranging from 2700-3000 K are recognised as warm colours. So, the light sources with lower colour temperature (for example- candle light, tungsten light, etc.), release reddish light, and make colours look more warm. On the other hand, light released from a cloudy sky produces a blueish light, and makes colours look cool. It can create a problem in photography or video recording, because in different colour temperatures the camera will not be able to recognize the true white colour. As a result, it will record wrong colours. To solve this issue, cameras are equipped with white balance settings and controls.

Activity 1

Take any small object (a small showpiece, pen stand, paperweight, etc.) and keep it in a dark room. Brighten it with an electric torch. You can also use your smartphone torch. Observe the shadow created. Now, place a white thin paper in front of the torch and observe the effect on the shadow. After completing this activity, write the use of diffuser to soften the light.

Check Your Progress : 1

Note : Use the space given below for your answers.

Compare you answers with those given at the end of the unit.

1. How is reflected light different from incident light ?

……

……

……

2. What is soft light ?

……

……

……

3. Camera captures mostly _____light.

   a. Incident light

   b. Reflected light

c. None of the above

4. Morning sun has higher colour temperature than noon sun.

   a. True

   b. False

3.4 FUNDAMENTALS OF LIGHTING

After discussing the main characteristics of light, it is now important to understand some of the fundamental concepts used in lighting. In this section, we shall discuss them in detail.

3.4.1 Sources of Light

An object that emits light is called a source of light. In the context of photography and audio-visual production, light sources can be classified into two main categories:

1. Natural Light Source
2. Artificial Light Source

1. Natural Light Sources: These light sources are available in nature. The Sun is the main source of natural light. The Moon is also considered a natural light source that provides light at night. However, if we think technically, the Moon does not emit light. It only reflects the sunlight. The Sun is used as the main light source in outdoor photography or television production. You can use different reflectors to reflect sunlight to illuminate different parts of your frame. Sunlight can also be used in indoor shoots. In rooms, you can use windows to get the sunlight. With the help of reflectors you can illuminate different areas of the room with sunlight.

2. Artificial Light Source: Artificial light sources are man-made light sources. All types of electric lamps fall under this category. We often use artificial light sources in photography or television production. Artificial lights are mainly used in studios, other indoor shoots or outdoor shoots at night but many times they are used in day time outdoor shoots also. There are many artificial lighting options available and you can choose according to your needs. Earlier, tungsten lights were used which produced a lot of heat but now cooler LED lights are also available. We shall discuss about several artificial light sources in the upcoming section on lighting instruments.

3.4.2 Direction of Light

The direction of light also plays an important role in lighting. Here, direction means the relative position of the subject and the source of light. That is, from which direction, from which height, and at what angle is the light falling on the subject. The direction of light determines the effects of lighting. You can understand this effect with a small activity. You should do this activity preferably at night, but if you have a room in your house that you can completely darken in the day, then you can do it in the daytime also. First of all, take a torch. Then along with any member of your family reach the room. Make that family member sit in a chair. Close the door and turn off all the lights there.

Now your room will be completely dark. You can then put the torch light on the face of your family member from different directions and see its effects. If possible, these pictures can also be taken with a mobile camera. When you put the light from above, a different kind of glow appears on the face which looks like positive and divine light. But as soon as you change the direction of light and put it on the face from the very bottom, its effect also changes. Now the face starts looking a little scary. Now you can put the light from behind and then from the side and see the effects. After finishing this activity, you can analyse it by looking at the pictures taken from the mobile. This analysis will tell you how changing the direction of light falling on the same object may create different effects.

3.4.3 Lighting Ratio

Generally, the lighting ratio is the ratio between the intensity of the key light and fill light. Suppose you are doing portrait photography and using both key and fill lights. You measured the intensity of your key light near the face of your subject with an incident light meter and it came to 600 lux. Then you also measured the intensity of the fill light and if it came to 300 lux. It means, your key to fill lighting ratio was 2:1. The lighting ratio shows the difference between the brightness of key light and fill light.

Lighting is a creative work and you can decide the lighting ratio according to your need. You can also experiment with different lighting ratios, but 2:1 is considered to be a popular lighting ratio. It means, key light should be two times brighter than fill light. If you change the lighting ratio to 1:1, the brightness of key light and fill light will be the same and the darkness of shadows will be reduced considerably. This type of lighting is called flat lighting. In this, the contrast is significantly reduced and the picture appears visually dull. More difference between the brightness of key and fill light creates dramatic effects which are visually more interesting.

3.5 BASIC LIGHTING TECHNIQUES

As we discussed earlier, lighting is a planned use of light to achieve the desired effect. It is also a creative field. Here we shall discuss some of the lighting techniques commonly used in photography and television programme production.

3.5.1 Three-point Lighting

Three-point lighting is a basic lighting technique commonly used in photography and television production. As the name suggests, it uses three different lights - key-light, fill light and back light. Here, we shall discuss these lights in detail.

Key Light: Key light is the main light which is used to provide adequate light to the subject. It is the brightest light in the lighting setup. In natural lighting, the Sun is used as the key light. You can place key light according to your need but usually we place the key light 45 degree vertical and 45 degree horizontal from the lens axis. So, key light illuminates the subject from one direction and creates shadow on the other side. Figure (4) explains the placement of key light.

Fill Light: As the name suggests, fill light is used to fill the shadows created by the key light. It reduces the contrast of the image. Generally softer lights are

used as the fill and it has less intensity (generally 50%) than the key. You can reduce its intensity by taking the light away from the subject. Diffusers can be used to create the fill light. In natural lighting where sun is used as the key light, you can use the reflectors as fill. We place the fill light on the opposite side of the key light. For example, if key is placed on the left side of the camera, fill will be put on the right side. You can see the placement of fill light in the figure (4).

Back Light: The back light illuminates the subject from behind. It illuminates the shoulders and hair of the subject and separates the subject from the background and gives a three dimensional look. If you do not use the back light, then your subject will be affixed to the background. You can place the back light diagonally opposite to the key. Figure (4) shows the placement of back light.

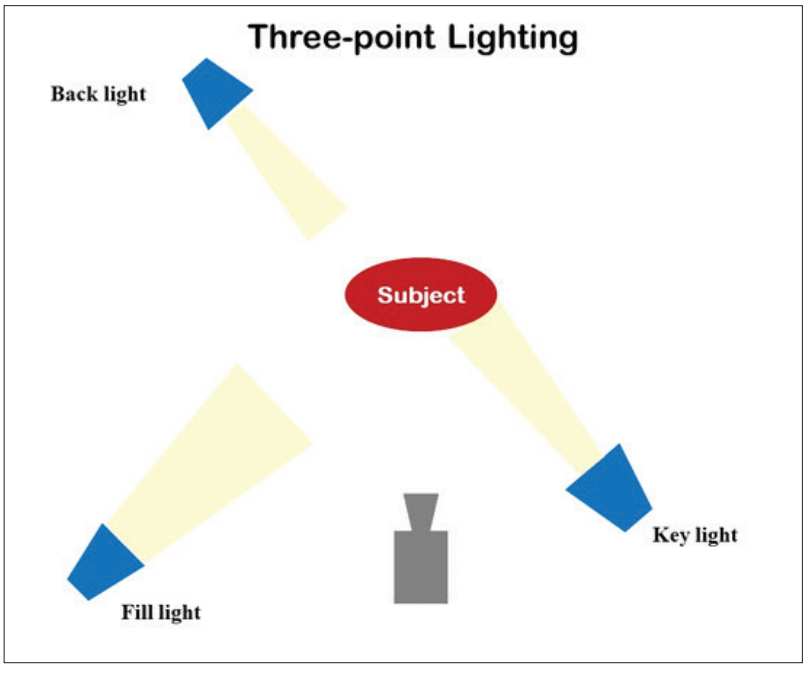


Image Source: Amit Kumar

Figure 4: Three-point Lighting

In three-point lighting, you can use these three lights according to your requirement. You can experiment with their intensity and placement.

3.5.2 Four-point Lighting

In four-point lighting, we add one more light to three-point lighting setup and that light is the background light. Let us discuss about the background light.

Background Light: We should not confuse between the background light and the back light. The background light is completely different from the back light. It is used to highlight the background. If we want our background to come into the frame, then in this case the background light is used. The direction of this light is towards the background.

Following diagram (Figure-5) shows a four-point lighting setup.

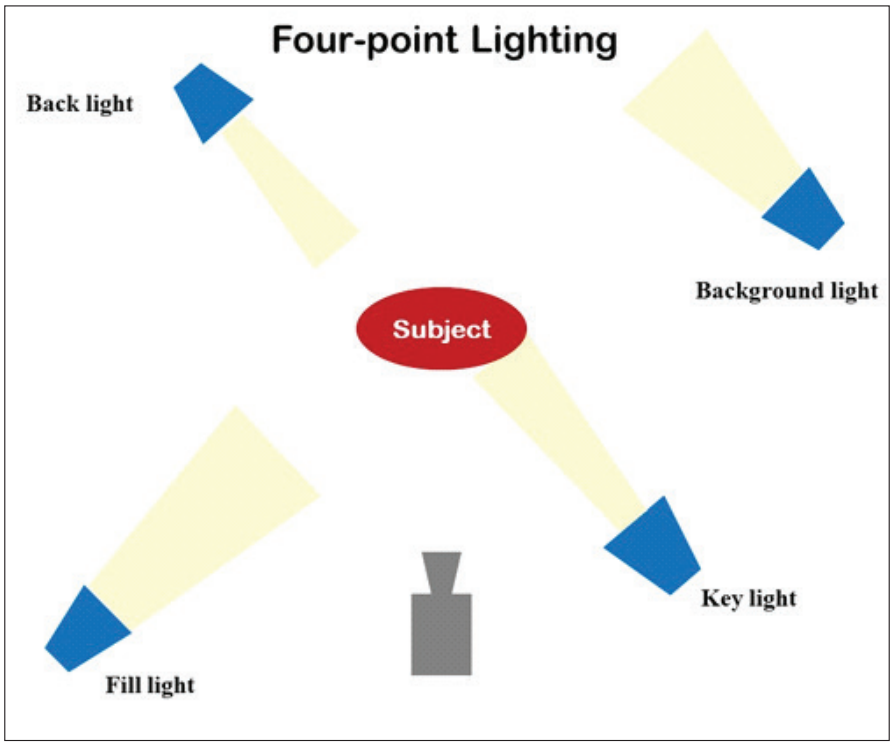


Image Source: Amit kumar

Figure 5: Four-point Lighting

3.5.3 Flash Photography

Photographers have been using flash for a long time. It is a device that produces brief bursts of light at daylight colour temperature (about 5500K). This journey began with magnesium ribbons and eventually progressed to the modern flash units. Flash is used in photography to illuminate the subject and sometimes for freezing the movements. You can find different types of flash. The built-in flash comes as a part of the camera. A separate flash unit can also be attached to the camera through accessory shoe (Hot shoe). We can also mount the flash units on the light stands. Single or multiple flashes can be used according to our need. We can use flash as key, fill, back and background lights. These flash units are synchronized with the camera through cable or radio signals and follow the shutter click.

Flash can be used with reflectors and diffusers. You can find bounce cards and wide angle diffusers with flash units. Flash units have both the modes – auto and manual. In manual mode, we have flexibility to set the flash power according to our need. The zoom facility is also available in the flash units. Speedlite and Speedlight are two popular brand names of electronic flash units manufactured by Canon and Nikon respectively.

Activity 2

Take any small statue or doll available in your house and keep it in a completely dark room. Then arrange three torches. Use these three torches as key light, fill light and back light. You can use white paper as diffuser. Taking the help of your family members, do the following activities and take their pictures with your mobile phone:

i. Illuminate the statue only with key light.

ii. Switch on both key and fill light.

iii. Use all the three lights (key, fill and back).

iv. Use only the back light.

Now, analyse these four pictures and write down the role of key, fill and back light in three-point lighting in your words.

Check Your Progress : 2

Note : Use the space given below for your answers.

Compare you answers with those given at the end of the unit.

1. What is three-point lighting ?

……

……

……

2. Which of the following is not a part of three-point lighting ?

   a. Fill light

   b. Background light

   c. Key light

   d. Back light

3. Back light and background light do the same work.

   a. True

   b. False

3.6 LET US SUM UP

As we have already discussed, lighting is the backbone of photography and television / film production. Therefore, its importance is undisputed. It is a creative field and an important tool for visual storytelling. In this unit, we discussed various aspects of lighting in the context of photography and television production. We learned about the different characteristics of light because knowing them is essential to understand the nature of light. We also discussed some basic concepts related to lighting. Lighting is a creative field and you can choose lighting techniques according to your needs. You can also do many new experiments. In this unit, we also discussed some fundamental and popular lighting techniques. To be able to do effective lighting, it is necessary

that we also know about the equipment used in it. Therefore, different types of lights and lighting accessories were also discussed.

3.7 REFERENCES AND FURTHER READING

Belavadi, V. (2013). Video Production. Oxford University Press.

Millerson, G. (2013). Lighting for TV and Film. CRC Press.

Owens, J. (2020). Television production. CRC Press.

3.8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check You Progress 1

1. The incident light is the light that falls directly on the subject. It is different from the reflected light. The intensity of incident light depends upon the brightness of the light source. On the other hand, reflected light is the light reaching the camera lens, reflected from the surface of the subject. The reflected light gives you a perfect idea of how much light is bounced off the various subjects and reaches the camera lens. The intensity of reflected light depends upon two things. First, brightness of the light source and second nature of the objects' surface.

2. The soft light casts soft edged shadows. Soft lights are diffused and creates even distribution of colour tones and fewer shadows resulting in low contrast in the picture. You can find this type of light during cloudy days as the light from the Sun gets diffused passing through the clouds. The light then gets evenly distributed avoiding harshness. In artificial lighting, diffusers and papers are used to diffuse the light manually to get the even tone.

3. b. Reflected light

4. b. False

Check You Progress 2

1. Three-point lighting is a basic lighting technique commonly used in photography and television production. As its name suggests, it uses three different lights - key-light, fill light and back light. You can use these three lights according to your needs.

2. b. Background light

3. b. False

UNIT 4: LENSES AND OTHER ACCESSORIES

Structure

4.0 Introduction

4.1 Learning Outcomes

4.2 Photographic Lenses

4.3 Photographic Lens : Important Features

- 4.3.1 Focal Length
- 4.3.2 Angle of View
- 4.3.3 Aperture
- 4.3.4 Focus

4.4 Types of Photographic Lenses

- 4.4.2 Classification on the Basis of Focal Length
- 4.4.2 Classification on the Basis of Flexibility to Change Focal Length
- 4.4.3 Classification on the Basis of Speed
- 4.4.4 Macro Lens

4.5 Accessories

4.6 Lens Care

4.7 Let Us Sum Up

4.8 Further Readings

4.9 Check You Progress: Possible Answers

4.0 INTRODUCTION

In photography we see and record the world through lenses. Therefore, the lenses have an effect on the observed and recorded world. It shows the importance of lenses in photography. As a photographer we must know these lenses properly and only then we can use them efficiently for our needs. In this unit, we shall discuss in detail the various aspects of photographic lenses.

4.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- explain the different features of photographic lenses;
- describe the various types of photographic lenses; and
- discuss the uses of different accessories in photography.

4.2 PHOTOGRAPHIC LENSES

The lenses used in photography are not simple lenses, they are quite complex. They contain many optical elements and by combining those optical elements a photography lens is made which can produce a better and sharper image. Many elements are combined in making a photography lens, but when we see their overall effect, it is a converging effect. Lens is also an important topic of science and studied with great depth. Lens designing or optical designing is a

highly specialized field. But in this unit, we shall discuss photography lenses according to the need of a mass communication student. We shall focus on the aspects of photography lenses that a photographer requires to know.

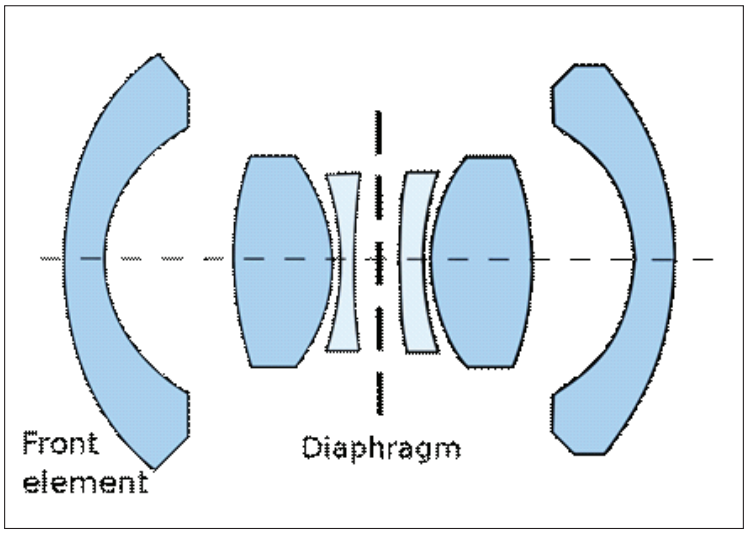


Image 4.1 Cross-section of a photographic lens

Image Source: Rama. Inspired from en:File:Symmetrical.png by en:User:Anoneditor, made from scratch by Rama, CC BY-SA 2.0 FR <https://creativecommons.org/licenses/by-sa/2.0/fr/deed.en>, via Wikimedia Commons

4.3 PHOTOGRAPHIC LENS : IMPORTANT FEATURES

In this section, we shall discuss about various important features of photographic lenses. These are focal length, angle of view, aperture and focus. First we discuss the focal length.

4.3.1 Focal Length

Focal length is the most common and important feature of any photographic lens. We identify camera lenses by their focal length. Every photographic lens must have its focal length mentioned on it.

But what is the focal length? Is it the physical length of the photographic lenses? No, not at all. Please do not get confused between the physical length of the lens and the focal length. Actually, focal length is the distance between the optical centre of the lens and the image sensor. The image sensor is placed at the focal plane. Focal length is measured in millimetres (mm). For example – 35mm, 50mm, 85mm, 200mm, etc.

Focal length plays a very important role in photography. It affects the angle of view or view field or the area captured. It also affects the depth of field. Bigger focal length, lesser depth of field. This means that a photograph taken with a 50 mm lens will have a greater depth of field than a photograph taken with a 100 mm lens. Now we shall discuss about angle of view. We shall also examine the relationship between focal length and angle of view.

4.3.2 Angle of View

In photography, angle of view refers to the angular range of a scene that is captured by the camera in its image. Angle of view can be measured horizontal, vertical and diagonal. For example:

i. Angle of view of 50mm lens :

Diagonal - 46° , Horizontal - 40° , Vertical - 27°

ii. Angle of view of 35mm lens :

Diagonal - 63° , Horizontal - 54° , Vertical - 38°

This range also gives an idea of the field view. The angle of view determines how much of the scene will be covered by the camera in its image. More angle of view means more area and things will be covered in image and less angle of view means less area and things will be in picture.

Let us try to understand it with an example - you are taking a group photo of a large group of your classmates. You are using a lens that covers all your classmates. Now you change the lens and choose a new lens with less angle of view. If you don't change the distance between the group and the camera, some of your classmates standing on the outer edges of the group may disappear from the picture.

The angle of view is determined by the focal length of the lens and the camera format (the size of the image sensor). If the camera format is constant, then the focal length and angle of view have the following relationship:

Longer Focal Length → Narrower Angle of View

For example (Canon lenses for 35mm format) :

a. Angle of view of 50mm lens :

Diagonal - 46° , Horizontal - 40° , Vertical - 27°

b. Angle of view of 85 mm lens :

Diagonal - 28°30′ , Horizontal - 24 , Vertical - 16°

c. Angle of view of 800mm lens :

Diagonal - 03°05′, Horizontal - 02°35′ , Vertical - 01°40′

All the above examples (a,b & c) show that the angle of view (diagonal, horizontal and vertical) decreases as the focal length increases.

Another factor that affects Angle of View is the camera format or the size of the image sensor. Image sensors replaced films in photography and digital cameras use different sizes of image sensors. For example - Full frame (36x24mm), APS-H (Canon) (28.7x19mm), APS-C (Nikon, Sony, Fuji, etc.) (23.6x15.7mm), etc. If we use the same lens of a fixed focal length with full frame and APS-C cameras, it will give a wider angle of view in full frame camera than with APS-C.

4.3.3 Aperture

Aperture is an important feature of photographic lenses. It is a hole or opening of the lens through which light enters the camera. You can change its size. It can be increased or decreased. If you increase its size then more amount of light will enter the camera and if it is reduced then relatively less light rays will be able to enter the camera. The entire amount of light falling on the outer surface of the lens does not cross the lens and go inside the camera. The amount of light that will be able to cross the lens is determined by the size of the aperture itself.

The size of the aperture is denoted by f-numbers or f-stops. For example: f/1.4, f/2, f/2.8, etc. Here, we should always keep one thing in mind that if the f-number is increasing, it means that the size of the aperture is decreasing. For example: If you compare f /22 and f/8, the aperture size of f/22 will be lesser than that of f/8. We shall discuss more about aperture in unit-7.

4.3.4 Focus

The sharpest image in photography can be obtained at the focal plane and as we discussed above the light gathering surface of the image sensor is placed exactly at the focal plane. If the image is formed exactly at the focal plane, it will get maximum sharpness but images formed before or after the focal plane will be blurred. So in photography, it is important to ensure that the images are formed exactly at the focal plane. To achieve this accuracy, we adjust the distance between the subject, the lens, and the image sensor. This process is called focusing.

Photographic lenses have both options - AF and MF. AF stands for automatic focus or autofocus and MF stands for manual focus. If you choose manual focus, you must rotate the focusing ring available on the camera lens to focus on your subject. Once you have achieved proper focus you press the shutter button. In the case of autofocus, the focusing ring locks and your camera automatically focuses on the subject. You cannot move the focusing ring in AF mode. Here, when you press the shutter button halfway down, a motor moves the optical elements in the lens to focus the subject.

Check Your Progress : 1

Note: 1) Use the space below for you answers.

2) Compare your answers with those given at the end of this unit.

1. What is focal length ?

---

2. Explain the term ‘Angle of View’ and how does it impact photography ?

4.4 TYPES OF PHOTOGRAPHIC LENSES

Lenses can be classified on various grounds. In this section we shall discuss the different types of lenses classified on different bases.

4.4.1 Classification on the Basis of Focal Length

On the basis of focal length, lenses can be classified into three following categories:

i. Normal/Standard Lens

ii. Wide-Angle Lens

iii. Telephoto Lens

i. **Normal/Standard Lens:** A normal or standard lens gives almost the same perspective as the human eye. The viewing experience it provides is very close to that of the human eye. That's why it is called normal or standard. The focal length of a normal lens varies with the format of the camera or the size of the image sensor. Generally, a lens with focal length approximately equal to the diagonal of the image sensor is called a normal lens. For a full frame camera (36x24 mm), the diagonal of image sensor is 43mm, so 50mm lens will be considered normal lens for this camera. In common terms 35mm to 50 mm lenses are considered as normal.

ii. **Wide-Angle Lens:** Lenses with shorter focal length than the normal lens are called wide-angle lenses. Usually lenses smaller than 35mm focal length fall into this category. It gives wider angle of view or field of view and greater depth of field. These lenses can be used to photograph landscapes, architecture, large groups of people, etc. Wide-angle lenses are available as both prime and zoom lenses.

Fisheye lens: Fisheye lenses are ultra-wide or super wide. They give angle of view of 180º or more. These lenses have very short focal length (usually less than 18mm). Fisheye lenses are used in landscapes, architectures, crowd, artistic photography etc. Barrel distortion is common in fisheye lenses. These lenses are available as both prime and zoom. For example: 16mm fixed focal length fisheye lens, 8-15mm zoom fisheye lens, etc.

iii. **Telephoto Lens:** A lens which has significantly longer focal length than the normal is called telephoto lens. Generally, lenses 85mm or more fall in this category for full frame cameras. These lenses have narrower angle of view and lesser Depth of Field (DOF).

Telephoto lenses bring distant objects closer and are popularly used in sports and wildlife photography. In wildlife photography you want to capture animals' movements but you cannot get close to them. If you get close to animals they will not behave naturally and sometimes it can be dangerous. So, telephoto lenses are the best option. Even in sports, you won't be able to get close to players during game, so the only way to get your subject closer is with a telephoto lens.

Telephoto lenses are available as both prime lenses (fixed focal lengths) and zoom lenses. For example: 100-400mm, 70-300mm, etc. There may be another sub category in the category of telephoto lenses called super telephoto. Generally, lenses over 200 mm fall in this category. For example: 400mm, 600mm, 800mm, etc.

4.4.2 Classification on the Basis of Flexibility to Change Focal Length

On the basis of the flexibility to change the focal length, photographic lenses can be divided into two following classes:

i. Prime lens

ii. Zoom lens

i. **Prime lens :** Prime lenses are lenses whose focal length cannot be changed. They are also called fixed focal length lenses. In these lenses,

we do not have the flexibility to change the focal length. These lenses are optically less complex than the zoom lenses and generally their images are sharper. Since prime lenses are made up of a combination of fewer optical elements, they are also less prone to distortion. Prime lenses are smaller in size and cheaper than zoom lenses. It also offers wider aperture size than the zoom, so your image sensor gets more light. Wider aperture also allows for faster shutter speeds. For example – 50mm, 85mm, 200mm, etc.

ii. **Zoom lens:** Zoom lenses are such lenses which have a range of focal length and within that range we can change their focal length as per our requirement. For example, we take a zoom lens whose focal length is from 50mm to 200mm. In this case, we can change the focal length of this lens anywhere between minimum 50mm and maximum 200mm as per our needs.

Zoom lenses are popular because photographers feel comfortable using them. There is no need to carry multiple fixed focal length lenses if you have a zoom lens. Zoom lenses also provide speed. You can take pictures of different situations without changing your lens. You just need to change the focal length in the same lens.

We shall understand it with an example. Suppose you are a tree with a 50mm lens and suddenly you saw a beautiful bird on it. Now you want to capture it, but you need a telephoto lens to take that bird's picture. If you are using fixed focal length lens then you need to replace 50mm lens with 200mm telephoto lens. This takes time and it is possible that the bird will not be available due to this delay. Now just imagine that you were shooting with a 50mm-200mm/55mm-200mm zoom lens. So in this case, there is no need to replace the lens. You can quickly change your focal length to 200mm and capture the bird.

There are different categories of zoom lenses available in the market. For Example:

Fisheye zoom : 8mm-15mm

Ultra-wide zoom : 14mm-35mm, 10mm-18mm, 16mm-35mm, etc.

Standard zoom : 18mm-55mm, 18mm-135mm, 24mm-105mm, etc.

Telephoto zoom : 70mm-200mm, 100mm-400mm, 100mm-500mm, etc.

There are many advantages of zoom lens but some disadvantages too. Generally prime lenses have wider maximum aperture than a zoom. Since zoom lenses are quite complex and are made up of multiple optical elements, the chances of distortions are also high. Cheap zoom lenses are prone to distortions and good quality zooms are quite expensive. Zoom lenses are bigger and generally we tend to compromise on the perspective when using a zoom lens.

4.4.3 Classification on the Basis of Speed

Lens speed is linked to the shutter speed allowed by a photographic lens. It depends on the maximum aperture size of the lens. If a lens has a larger maximum aperture, it can allow faster shutter speeds. On the basis of this criterion, photographic lenses can be classified into two following categories:

i. Fast Lens

ii. Slow Lens

i. **Fast Lens:** Fast lenses are lenses with large maximum aperture. In general, lenses with maximum aperture of f/2.8 or higher fall into the category of fast lenses. The larger aperture allows more light to enter the camera. So we can go for a faster shutter speed without reducing the amount of light required for photographs. Since these lenses have wide maximum aperture, they will be useful in situations where we shoot in low light conditions or we need to use a fast shutter speed without compromising on exposure.

   We can understand this with an example. Suppose you have to shoot an indoor sports event. You need to go with fast shutter speed to freeze the actions of the players but you also need proper light on your photos. So, if you have a fast lens with a large maximum aperture, you will increase the shutter speed as well as the size of the aperture to freeze the motion with proper exposure. We shall discuss these things more in Unit 7.

ii. **Slow Lens :** Slow lenses are lenses with relatively small maximum aperture. Since they have relatively small maximum aperture, they need to go with slower shutter speeds to get the optimal exposure.

4.4.4 Macro lens

Macro lenses are used for extreme close-up photography. If you want to capture a small beautiful insect with all its details then you need a macro lens because with normal lens it will be difficult to focus the insect very closely. These lenses enable us to record 1/2 life size to life size images without any accessories. 1/2 life size means 1:2 reproduction ratio and life size means 1:1 reproduction ratio.

Here you need to understand what the reproduction ratio is. The reproduction ratio is the ratio between the size of the image recorded on the image sensor and the actual size of the subject. It can be calculated by dividing the size of the image recorded on the image sensor by the actual size of the subject. So if the size of the image recorded on the image sensor is equal to the actual size of the subject then it is said to be life size (reproduction ratio 1:1) and if the size of the image recorded on the image sensor is half of the actual size of the subject, it is called 1/2 life size (reproduction ratio 1:2).

Check Your Progress : 2

Note: 1) Use the space below for you answers.

2) Compare your answers with those given at the end of this unit.

1. What is a zoom lens and how is it different from a prime lens?

---

2. Differentiate between wide angle lens and telephoto lens.

4.5 ACCESSORIES

i. **Lens Hood :** Lens hood is a device which is placed at the end of a photographic lens. It blocks the rays of light (from strong light sources) coming into the lens from side angles and causing glare or lens flare. By doing so it improves the image contrast. Lens hood is also useful to protect the front element of camera lenses from scratches, accidental impacts, fingerprints, etc. Generally there are two types of lens hoods available in market - Cylindrical and Petal-type. Cylindrical lens hoods should be avoided with wide angle lenses. When using a lens hood, we need to be careful for two things - the lens hood shouldn't get into your photos and it shouldn't block your built-in flash.

Image 4.2 Lens with and without lens hood

Source: Tom Roeleveld from Zoetermeer, The Netherlands, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

ii. **UV Filter :** UV filter means ultraviolet filter. It was very useful in the days when photography cameras used films. It reduces the amount of ultraviolet rays entering the camera to improve the image. Photographic films were quite sensitive to UV rays. But now in the age of digital photography there is not much need for additional UV filters to cut off UV light as digital cameras are less sensitive to UV rays. But UV filters are also used to protect lenses. It is like an additional protective shield on the front surface of your photographic lens. Sometimes accidental scratches can occur in the lens. If you use a UV filter, then instead of expensive lenses, there will be scratches on the filter. It is advisable to use a good quality UV filter to maintain your image quality. Cheap UV filters may spoil your image quality.

iii. **Tele-converter :** A teleconverter can be used to enhance the telephoto effect of a lens. It is attached between the camera body and the lens. If you have a 70mm-200mm lens and you use a 1.4x magnification teleconverter you can get the effect of a 280mm lens. And you can get the effect of up to a 400mm lens if you use a 2x magnification teleconverter.

Teleconverters are small in size and are cost effective. If you have 70mm-200mm lens but you want to shoot with 400mm lens then you have two options. Buy a 400mm lens or go with a compatible 2x magnification teleconverter. Teleconverter option will be quite economical for you.

Lens speed or loss of light and possible decline in sharpness are some of the disadvantages of using teleconverters.

iv. **Extension Tubes :** Extension tube is an accessory used between the camera body and the lens. It increases the distance between the lens and the image sensor. It is also called extension ring. Extension tubes help in closer focusing and enable you to do macro photography without a true macro lens.

v. **Reversal Ring Adapter :** This adapter helps to fit the lens with the camera in reverse position. First fit this adapter to your camera body and then you can mount your lens on the camera in reverse position. This technique is used for macro photography.

vi. **Lens Case/bag :** The lens case is used to store or transport lenses safely. These cases/bags are available in different sizes.

vii. **Lens Cap:** Lens caps are very useful as they protect the camera lens from scratches and fingerprints.

4.6 LENS CARE

Lens is one of the most important components of our camera and must be taken care of properly. By keeping the following things in mind, we can protect our photographic lenses :

- We should always use lens cap
- Do not carry the camera on your shoulder
- Do not carry the camera in a bag containing other loose items without lens protection
- Clear glass UV filter can be used to protect the lenses
- Lens hoods are also useful for protecting the photographic lenses
- Clean the lens with lens cleaning fluid
- Never clean the lens with a dirty or rough cloth as it can scratch the lens
- Lens fungus is also a threat to photographic lenses. To keep the lenses safe from fungal growth, they should be kept away from dust and moisture. Always keep lenses in a cool and dry place.
- If you are not going to use your camera lenses for a long time, keep them in a dust-free and moisture-proof cabinet with a silica gel packets. These silica gel packets absorb moisture.

Activity 1

Take pictures of the same subject from the same distance with lenses of different focal lengths. You can also use a zoom lens and take pictures by setting different focal lengths. Compare all photographs and write down your observations.

Check Your Progress : 3

Note: 1) Use the space below for you answers.

2) Compare your answers with those given at the end of this unit.

1. List five things that should be kept in mind to protect photographic lenses.

---

2. Explain the uses of any three camera lens accessories.

4.7 LET US SUM UP

Lenses play an important role in photography. If you want to become a good photographer, then you must have proper knowledge of photographic lenses. Understanding lenses and their features helps us to choose suitable lenses for various photographic assignments. In this unit we have discussed various aspects of photographic lenses. We talked about the important features of camera lenses i.e. focal length, angle of view, aperture and focus. We also discussed the different types of lenses and their uses. And lastly, lens accessories also help us in photography. We have also discussed about these accessories in this unit.

4.8 FURTHER READINGS

Kelby, S. (2012). The digital photography book. Peachpit Press.

Langford, M., Fox, A., & Smith, R. S. (2015). Langfords basic photography: the guide for serious photographers. 10th Edition. Amsterdam: Focal Press/ Elsevier.

Peterson, B. (2016). Understanding exposure: how to shoot great photographs with any camera. AmPhoto books.

Judge, A. (2013). Understanding DSLR Lenses: An Illustrated Guidebook.

4.9 CHECK YOU PROGRESS: POSSIBLE ANSWERS

Check Your Progress : 1

1. Focal length is the distance between the optical centre of the lens and the image sensor. The image sensor is placed at the focal plane. Focal length is measured in millimetres (mm). For example – 35mm, 50mm, 85mm, 200mm, etc. Focal length is the most common and important feature of any photographic lens. We identify camera lenses by their focal length. Every photographic lens must have its focal length mentioned on it.

2. In photography, Angle of View refers to the angular range of a scene that is captured by the camera in its image. Angle of view can be measured horizontal, vertical and diagonal. For example: Angle of view of 50mm lens (diagonal - 460 , horizontal - 400 , vertical - 270), Angle of view of 35mm lens (diagonal - 630, horizontal - 540 , vertical - 380). This range also gives an idea of the field view. The angle of view determines how much of the scene will be covered by the camera in its image. More

angle of view means more area and things will be covered in image and less angle of view means less area and things will be in picture.

Check Your Progress : 2

1. Zoom lenses are such lenses which have a range of focal length and within that range we can change their focal length as per our requirement. For example, we take a zoom lens whose focal length is from 50mm to 200mm. In this case, we can change the focal length of this lens anywhere between minimum 50mm and maximum 200mm as per our needs. On the other hand, prime lenses are lenses whose focal length cannot be changed. They are also called fixed focal length lenses. In these lenses, we do not have the flexibility to change the focal length.

2. Lenses with shorter focal length than the normal lens are called wide-angle lenses. Usually lenses smaller than 35mm focal length fall into this category. It gives wider angle of view or field of view and greater depth of field. On the other hand a lens which has significantly longer focal length than the normal is called telephoto lens. Generally, lenses 85mm or more fall in this category for full frame cameras. These lenses have narrower angle of view and lesser Depth of Field (DOF). Telephoto lenses bring distant objects closer and are popularly used in sports and wildlife photography.

Check Your Progress : 3

1. By keeping the following five things in mind, we can protect our photographic lenses :

   - We should always use lens cap.
   - Do not carry the camera in a bag containing other loose items without lens protection.
   - Lens hoods are also useful for protecting the photographic lenses.
   - Never clean the lens with a dirty or rough cloth as it can scratch the lens. Use lens cleaning fluid to clean the lens.
   - If you are not going to use your camera lenses for a long time, keep them in a dust-free and moisture-proof cabinet with a silica gel packets. These silica gel packets absorb moisture.

2. **Lens Hood:** Lens hood is a device which is placed at the end of a photographic lens. It blocks the rays of light (from strong light sources) coming into the lens from side angles and causing glare or lens flare. By doing so it improves the image contrast. Lens hood is also useful to protect the front element of camera lenses from scratches, accidental impacts, fingerprints, etc.

   Tele-converter : A teleconverter can be used to enhance the telephoto effect of a lens. It is attached between the camera body and the lens. If you have a 70mm-200mm lens and you use a 1.4x magnification teleconverter you can get the effect of a 280mm lens.

Extension Tubes : Extension tube is an accessory used between the camera body and the lens. It increases the distance between the lens and the image sensor. It is also called extension ring. Extension tubes help in closer focusing and enable you to do macro photography without a true macro lens.

UNIT 05: INTRODUCTION TO VISUAL COMMUNICATION

Structure

5.0 Introduction

5.1 Learning Outcomes

5.2 Visual Communication : An Introduction

5.3 What is Visual Communication

- 5.2.2 Visual Thinking
- 5.2.3 Different Tools of Visual Communication
- 5.2.4 How do we see ?
- 5.2.5 Importance of visuals in communication

5.3 Theories of Visual Communication

- 5.4.1 Sensual Theories
- 5.4.2 Perceptual Theories

5.4 Elements of Design

5.5 Principles of Design

5.6 Let Us Sum Up

5.7 Further Readings

5.8 Check Your Progress: Possible Answers

5.0 INTRODUCTION

Visual communication is a very important and powerful area of communication. We all know that conveying messages through visuals is very effective and impactful. If we look around us, we are always surrounded by visuals. Our eyes keep seeing different types of scenes continuously. Even in sleep when our eyes are closed, we cannot avoid visuals. Even at that time the scenes go on in our mind in the form of dreams. Not being able to escape from the visuals even in sleep proves that apart from the eyes, the brain also plays an important role in seeing the visuals.

Visual components also dominate mass media. Except radio or audio medium, every medium is full of visuals. Be it print media or television or online medium. Mass media is full of visual components such as photographs, cartoons, illustrations, infographics, animations, paintings, videos, etc. In this unit we shall discuss the various aspects of visual communication.

5.1 LEARNING OUTCOMES

After going through this unit you will be able to :

- define visual communication;
- understand the importance of visual communication;
- enumerate the various tools of visual communication;

- explain the different theories of visual communication; and
- describe the elements and principles of design.

5.2 VISUAL COMMUNICATION : AN INTRODUCTION

When we use visual elements to communicate your message, it is called visual communication. In this section, we shall discuss the introductory aspects of visual communication.

5.3 What is Visual Communication

Visual communication is the use of images, symbols, graphics, and other visual elements to convey information, ideas, opinion and any type of messages to the audience. It is a broad term that includes a wide range of visual media, including photographs, illustrations, videos, diagrams, charts, graphs, animations, etc.

Visual communication is an vital part of our daily lives and is used in a variety of fields including advertising, journalism, education, entertainment and the arts. It is a powerful tool for quickly and effectively communicating complex ideas and feelings, and can often communicate more efficiently than words alone.

Visual communication can take many forms and can be used to communicate a wide variety of messages. For example, photograph or video may be used to evoke an emotional response or tell a story, while infographics may be used to convey complex data in a simple and easy-to-understand format. Overall, visual communication is a key component of effective communication and plays an important role in shaping our understanding of the world around us.

5.2.2 Visual Thinking

Visual thinking is a cognitive process that involves using visual elements such as images, diagrams, and other forms of visual representation to understand, process, and communicate information. This type of thinking can involve mental imagery or the use of external aids such as charts or diagrams. There are various techniques that can be used to facilitate visual thinking, including sketching, mind mapping, and flowcharting. By practicing visual thinking, individuals can improve their ability to think creatively and communicate effectively.

Visual thinking is an important skill in many fields, including design, engineering, and education, as it allows individuals to better understand complex information and relationships by representing them in a more accessible format.

5.2.3 Different Tools of Visual Communication

In visual communication we communicate through visuals. These visuals can be created manually or by machines or by the combine efforts of human and machines. A painting or drawing made by hand is also a visual component and digital art created with the help of software also comes under the category of visual message. Visual messages can be of various types, such as photographs, videos, paintings, illustrations, cartoons, graphics, infographics, animations etc. Visuals can be created with the help of many tools. For example - manually by artists, cameras, graphic design software, presentation software, image editing

software, data visualization tools, video editing software, animation software, web designing software etc.

It shows that there are many tools available for creating visuals to communicate desired messages. We can choose them according to our need.

5.2.4 How do we see ?

The vision process in humans is complex and consists of several stages. It requires coordination of eye and brain. This process includes the following steps:

i. The light rays reflect from the object and enter the eye through the cornea. The cornea is the clear and protective outer layer of the eye.

ii. Light rays pass through the pupil. The pupil is the opening in the center of the iris. The iris is the colored part of the eye that controls the amount of light entering the eye.

iii. Eye lens focuses the light rays on the retina at the back of the eye and forms a real and inverted image of the object. This lens is located behind the iris. With the help of the ciliary muscles, the eye lens changes shape to adjust the focus of light depending on the distance of the object being viewed.

iv. The retina detects light rays. The retina is a layer of cells at the back of the eye. It contains photoreceptor cells called rods and cones. These cells detect light signals and convert them into electrical signals.

v. These electrical (converted from light) signals are then sent to the brain via the optic nerves. The brain interprets these signals as visual images, which are then processed and analyzed to provide information about the object being viewed, such as its color, size, motion etc.

vi. Now visual information is processed in different areas of the brain, including the primary visual cortex. The primary visual cortex is responsible for processing basic visual information. The information is then sent to other relevant parts of the brain for higher level processing and use.

Check Your Progress 1

Note 1) Use the space given below for your answer.

2) Compare your answer with those given at the end of this unit.

1. What are the tools that facilitate visual thinking ?

……
……
……
……

2. Explain the process of human vision.

……
……
……
……

3. Rods and cones are available in _____.
   a. Iris
   b. Cornea
   c. Retina
   d. Pupil
4. Ciliary muscles help in _____.
   a. Focusing the light
   b. Stopping the dust
   c. Analyzing the visuals
   d. Decoding the colours
5. Eye lens form real and inverted image of the object.
   a. True
   b. False

5.3 THEORIES OF VISUAL COMMUNICATION

In this section we will talk about some fundamental but important theories of visual communication which help us to understand the whole process of vision and meaning creation. Visual communication theories can be generally classified into two broad categories – Sensual theories and Perceptual theories.

5.3.1 Sensual vs Perceptual Theories

Both sensual and perceptual theories of visual communication focus on how people interpret and understand visual information, but they approach the matter from different perspectives.

Sensual theories of visual communication emphasize the role of sensory perception in how people perceive and interpret visual information. These theories suggest that visual communication involves more than the transmission of information through images or graphics, but also involves the senses and emotions of the audience. Examples of sensual theories include the Gestalt theory of perception, which emphasizes the importance of visual elements such as proximity, similarity, continuity, and common fate in creating a sense of wholeness and unity in visual communication.

Perceptual theories of visual communication, on the other hand, focus on the cognitive and mental processes involved in the interpretation of visual information. These theories suggest that people interpret visual information by combining individual elements into larger, meaningful patterns.

Overall, the main difference between sensual and perceptual theories of visual communication is that sensual theories emphasize the role of sensory perception and emotional response, whereas perceptual theories focus on the cognitive processes involved in interpreting visual information. Both types of theory are important to understanding how people interpret and understand visual information, and designers and communicators must take both into account when creating visual messages.

5.3.2 Sensual Theories

Sensual theories of visual communication emphasize the role of sensory perception in how people perceive and interpret visual information. These theories suggest that visual communication involves more than the transmission of information through images or graphics, but also involves the senses and emotions of the audience.

Under the category of sensual theories of visual communication we will discuss two theories - Gestalt theory and Constructivism.

5.3.2.1 Gestalt Theory

Gestalt theory states that humans organize visual elements into groups and perceive them as a whole. According to Gestalt theory, the whole is greater than the sum of its parts, and the brain tries to fill in the missing information to form a coherent and meaningful image.

According to Gestalt theory, the individual elements within a design are combined and understood by the brain through the following principles:

i. Similarity

ii. Proximity

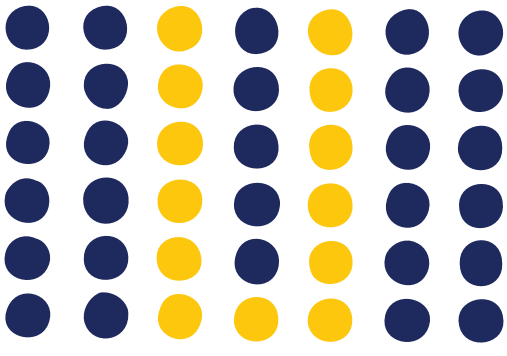
iii. Continuity/Continuation

iv. Common Fate

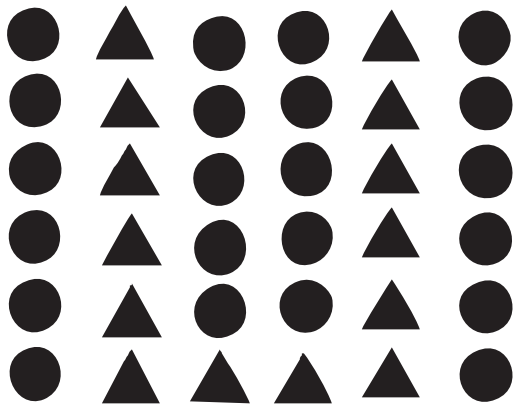
Similarity: Objects that are similar in some way tend to be grouped together in a person's perceptual experience. This similarity may be based on a variety of characteristics, such as color, shape, size, texture, orientation, or other visual properties.

According to Gestalt theory, our brains organize visual information into meaningful patterns or wholes, rather than perceiving individual elements in isolation. The principle of similarity states that when elements in a visual display share certain characteristics, our brains tend to group them as a single entity, or as part of a larger pattern or structure.

For example (image 1), in a display of colored small circles, circles of the same color are treated as a group, while circles of different colors are treated as separate ones. Similarly, in the display of different shapes, shapes that are similar in shape, size, or orientation are treated as a single group, while dissimilar shapes are treated as separate (see image 2).



(Image 1)

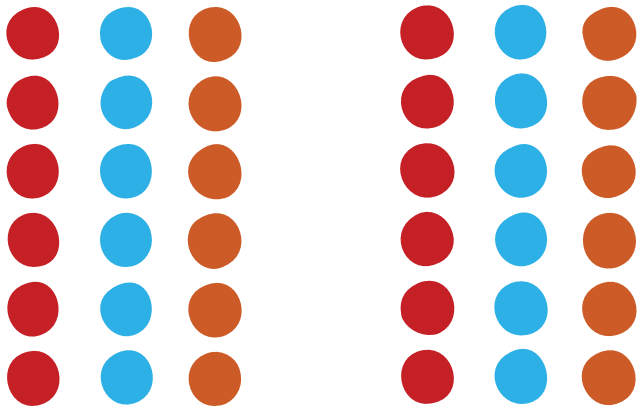


(Image 2)

Using the principle of similarity, we can create visual displays that are both aesthetically pleasing and easy to interpret. By grouping similar elements together, we can create a sense of visual unity and coherence, while also emphasizing important elements and creating a clear visual hierarchy.

Proximity: Proximity refers to the principle that objects that are close to each other are perceived as a group or unit. This means that when objects are placed near each other, they are perceived as being linked together and forming a comprehensible whole, even if they are not similar in shape, size, color or texture.

The principle of proximity suggests that the human brain organizes visual information into groups based on their spatial relationships. This means that if several objects are placed close to each other, they are considered to belong to the same group, even if they differ in other ways. For example, if you see some small circles, the circles placed closer will be perceived as separate groups or units. Image-3 explains the principle of proximity.



(Image 3)

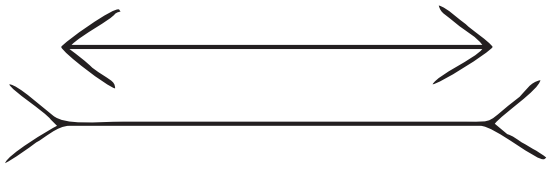
Proximity can be used in visual design to create a sense of organization and hierarchy. By placing related elements close to each other, we can create visual cues that help viewers understand how information is structured and related.

Continuation/Continuity: Continuity/continuation is a principles that states that people perceive patterns and shapes as being continuous and flowing, even when they are interrupted or hidden. This means that when we see a series of elements arranged in a certain way, we naturally see them as a continuous line or curve, even if some elements are missing or unclear.

The principle of continuation/continuity suggests that the human brain seeks to create a sense of order and coherence in the visual environment by arranging visual elements into patterns that are perceived as continuous and smooth. This means that when elements are arranged in a certain way, our brain automatically completes the pattern and fills in any gaps or missing elements to create a sense of continuity.

Continuity can be used in visual design to create a sense of flow and motion that guides a viewer's eye through a composition or layout. By using continuous lines or curves, we can create a sense of unity and cohesion in a design, and draw the viewer's attention to important elements or information.

Muller-Lyer illusion : In this famous example (Image 4) of the illusion, both lines are the same length but the bottom line appears slightly longer. This can be explained by the principle of continuity of Gestalt theory.



(Image 4)

Common fate: The principle of common fate states that elements that move or change together are treated as a group or unit. This means that when objects or elements move in the same direction or change in the same way, we see them as belonging together and forming a coherent whole, regardless of whether they are connected physically or similar in appearance.

This principle suggests that the human brain is sensitive to changes in the environment and is capable of perceiving patterns and relationships between visual elements based on their movement or behavior. This means that when objects move together, our brain interprets this as a sign that they are related and belong together.

Common fate can be used in visual design to create a sense of unity and motion, guiding the viewer's eye through a composition or layout. By using elements that move or change together, we can create a sense of cohesion and coherence in a design, and draw the viewer's attention to important elements or information.

5.3.2.2 Constructivism

According to the critics of Gestalt Theory, the viewers were considered largely passive in this. Many psychologists have attempted to highlight the importance of the viewer's own mental state during the viewing process.

According to constructivism, when one looks at any design, it is not just how the design is made that plays a role in the process. It emphasizes the importance of the viewer's active participation in constructing meaning from visual stimuli, rather than simply receiving it passively. The viewer has an important role. How his/her eyes are moving while looking at that design, what are the things in his/her memories, his/her experiences, his/her cultural background etc. all come together and complete the process of viewing and meaning creation.

Julian Hochberg, a professor in psychology at Columbia University suggests that visual communication can be more effective when it takes into account the patterns of eye movements and fixations that occur during visual perception.

By strategically placing visual elements in the areas where the viewer is likely to fixate, we can guide the viewer's attention and create a more engaging and memorable visual experience. Hochberg used eye-tracking machines in visual perception experiments.

5.3.3 Perceptual Theories

Perceptual theories try to explain the process of understanding visuals through perceptual approach. They attempt to understand how a person interprets a visual. The main emphasis in these theories is not on the sensory process but on the perceptual process. We shall discuss semiotics under the category of perceptual theories of visual communication.

5.3.3.1 Semiotics

Semiotics is also called semiology. It is the science of signs that explains how meaning is created and expressed through different types of signs. Semiotics looks at the relationship between signs and their referents (the things they signify) as well as the signs themselves. It examines how signs are used to convey meaning, how they are interpreted by different people and cultures, and how they can be manipulated or transformed to create new meanings. Ferdinand de Saussure (1857-1913) a Swiss linguistic & Charles Sanders Peirce (1839-1914) an American logician and philosopher are considered as the founders of modern semiotics. Semiotics states that the universe is full of signs and a sign can have many meanings.

Now the question arises, 'What is sign?' In semiotics, a sign is any object, gesture, sound, or image that stands for something else. We can understand it with the following examples :

Example 1

This is a picture of a pen. This is not a real pen but it stands for a real pen. So, this picture will be considered as ‘sign’ when it stands for a real pen.

Example 2

‘PEN’ is something that is made by combining lines. But it represents a tool that is used for writing. So, in this sense 'PEN' is a sign because it represents something else and that is a tool for writing.

In semiotics, each sign has two inseparable components: signifier and signified. This concept was originally given by Ferdinand de Saussure.

Signifier : The component of the sign which gives meaning. It is the physical form of the sign. It can be spoken words, written words, or even images.

Signified : Signified is the concept or idea that is represented by the signifier. What idea or concept is coming in our mind after seeing that sign is called signified.

Here, in this example, this image is signifier and the concept or idea of pen is signifier because when we see this image the idea of a tool used for writing comes in our mind.

Types of Signs

Charles Sanders Peirce classified signs into three different categories :

i. Icon/Iconic sign

ii. Index/indexical sign

iii. Symbol / symbolic sign

i. **Icon/Iconic sign :** An icon is a type of sign that represents a physical similarity or resemblance. Or you can say that an icon is a sign that looks like or resembles what it is signifying.

For example, a picture of a pen is an icon because it physically looks like a real pen. Similarly, a drawing of a bird is an icon because it is similar to the actual bird it represents.

Icons are often used to convey a message quickly and easily because their resemblance to an object or concept is easily recognizable.

ii. **Index/indexical sign :** An index is a sign that is directly connected to its referent through a causal relationship or evidence of existence. It means that an index is a sign that points to its referent by virtue of being caused by it or being physically connected to it in some way.

We can understand it with the help of examples. Smoke is an index of fire because it is directly caused by fire. In the same way, tiger's pugmarks are an index of tiger's presence because they are physically connected to the tiger who made them.

One more example, a skull and crossbones is an index of danger. It shows causal relationship. Dangerous things can kill us and turn us into skulls and bones. Indexes are a bit more complicated than the icons and take longer to interpret.

Image 5 : An index for danger (causal relationship)

iii. Symbol / symbolic sign : Symbols or symbolical signs are arbitrary. They have no logical connection with the things they represent. They carry coded meanings and one needs to learn these meanings to interpret or understand them. Symbols are arbitrary and culturally defined, which means that their meaning is determined by the shared understanding within a given society or culture. For example, the word "Mango" is a symbol in the English language that conventionally represents a certain type of fruit with a definite set of properties. People who do not know English can't understand the meaning of this symbolical sign. To extract the correct meaning of this symbol, one should have knowledge of English language, only then she/he can understand the coded meaning with the symbol 'Mango'. Another example is national flags. National flags are symbolical signs that represent the countries they belong to.

Check Your Progress 2

Note 1) Use the space given below for your answer.

2) Compare your answer with those given at the end of this unit.

1. What is principle of proximity in Gestalt Theory of visual communication?

……
……
……
……

2. Explain the differences between icon and index.

……
……
……
……

5.4 ELEMENTS OF DESIGN

Design elements are the basic building blocks that we use to create visual compositions. These elements are:

Line: Lines can be used to define shapes, create texture, and communicate movement. They can be straight or curved, thick or thin. We can use them to create a sense of depth or perspective.

Shape: A shape is a two-dimensional form that is defined by its edges and boundaries. Shapes can be geometric (eg, triangle, rectangle, circle, square etc.) or natural (such as trees, flowers, rivers etc.).

Colour: Colour is a powerful visual element for creating mood and emotion in a visual composition. We can use colours to convey meaning, highlight important information, or create contrast.

Texture: Texture is the visual or tangible quality of a surface. We can use it to create contrast, depth or visual interest in a design.

Space: Space refers to the area within and around a visual composition/design. You can use it to create balance, emphasis or depth in a composition.

Form: Form is the three-dimensional equivalent of shape. It refers to the physical or visual mass of an object and we can use forms to convey contrast, depth, or emphasis.

We can combine and manipulate these elements in a variety of ways to create effective and attractive designs in all fields of visual communication such as photography, graphic design, fashion design, website design, page design, interior design etc.

We shall discuss these elements in more detail in the next unit titled 'Photographic Composition'.

5.5 PRINCIPLES OF DESIGN

The principles of design are a set of rules or guidelines that help us create effective visual compositions. Some important principles of the design are – Unity, Emphasis, Balance, Contrast, Harmony, Proportion

Unity : A design is made up of several elements. The principle of unity says that all the elements should come together to create a feeling of completeness. The elements used in the composition should not appear scattered. Together, try to convey a message. A unified design will have elements that work together to create a cohesive whole.

Emphasis : According to this principle, the design should be clear about what is most important. A design should be prepared in such a way that the viewer's eyes go there first. By using this principal we can fulfill the purpose of our design. For example, if in a print advertisement, we want the readers' eyes to go to the new offer given by the company, then we should design it in such a way that the offer is placed at the focal point of the advertisement. The focal point is the part of a design where the viewer's eye first goes. This can be achieved through the use of size, color, contrast or placement.

An effective design should also have a clear visual hierarchy. A clear importance rating is necessary for a clear visual hierarchy. While designing anything, we should know that what is the order of importance of the things included in the design. That is, which thing is most important, which is second, which is third, etc. According to this order of importance, we also give visual weightage to those things. In this way, the viewers see that design according to the planning of the designer. And when it does, it is considered an effective design.

Contrast : Contrast talks about the use of opposing elements in a design to create visual interest. For example, large and small sizes, black and white colours, thick and thin lines, opposite directions etc.

Proportion: Proportion Refers to the relationship between the sizes of different elements in a design. Proportionate designs will have elements that are appropriately sized in relation to each other.

Rhythm: This principle of design is the use of repeated patterns or elements to create a sense of flow, movement, and visual interest in a composition. Rhythm is a fundamental aspect of design. There are many ways to create rhythm in a design, including the use of repetition, alternation and progression.

Repetition involves repeating a visual element, such as a shape, color or texture, at regular intervals. Alternation involves alternating two or more different visual elements, such as light and dark colors, to create a sense of movement and interest. Progression involves using a sequence of visual elements, such as increasing or decreasing the size of a shape, to create a sense of speed and direction.

Harmony: The principle of harmony in design refers to the use of elements that work together to create a sense of unity, balance, and coherence in a design. Harmony is achieved when all the individual elements in a design complement and enhance each other, rather than competing for attention.

There are many ways to create harmony in design. One approach is to use a cohesive color scheme, such as a monochromatic or similar color palette, which helps unify the different elements and create a cohesive look. Another approach is to use the same shape or pattern throughout the design, creating a sense of repetition and rhythm.

Balance: Each element in a design/visual composition has a certain visual weight. Visual weight can be understood as the ability of a visual element to

attract the attention of viewers. Balance refers to the distribution of visual weight in a design. A balanced design will have equal or proportional visual weight on both sides. Designs can be symmetrically or asymmetrically balanced. We shall discuss this principle in more detail in the next chapter.

Check Your Progress 3

Note 1) Use the space given below for your answer.

2) Compare your answer with those given at the end of this unit.

1. Describe any five elements of design.

……
……
……
……

2. Explain any three principles of design.

……
……
……
……

3. In a design, balance can be created _____.

   a. only symmetrically

   b. only asymmetrically

   c. symmetrically or asymmetrically

4. Contrast can be created by using large and small size shapes.

   a. True

   b. False

5.6 LET US SUM UP

We all know that visuals are very important for us. A large amount of communication is done through visuals in every walk of life. Both the eye and the brain play an important role in seeing and making sense of visuals. In this unit, we have discussed various aspects of visual communication. We talked about some important theories of visual communication, various tools of visual communication and their utility. Apart from this, various elements and principles of design were also discussed in detail.

5.8 FURTHER READINGS

Davis, M., & Hunt, J. (2017). Visual communication design: An introduction to design concepts in everyday experience. Bloomsbury Publishing.

Leborg, C. (2006). Visual Grammar: A Design Handbook (Visual Design Book for Designers, Book on Visual Communication). Princeton Architectural Press.

Principles of Design : https://xd.adobe.com/ideas/process/ui-design/5-principles-design/

5.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress 1

1. Various techniques can facilitate visual thinking, such as sketching, mind mapping, flowcharting etc.

2. The vision process in humans is complex and consists of several stages. It requires coordination of eye and brain. First, the light rays reflect from the object and enter the eye through the cornea and then pupil. These rays reach to eye lens which focuses the light on the retina and forms a real and inverted image of the object. The retina detects light and photoreceptor cells (rods and cones) convert light into electrical signals. These electrical signals (converted from light) are then sent to the brain via the optic nerves. The brain interprets these signals as visual images, which are then processed and analyzed to provide information about the object being viewed, such as its color, size, motion etc. Now visual information is processed in different areas of the brain, including the primary visual cortex. The primary visual cortex is responsible for processing basic visual information. The information is then sent to other relevant parts of the brain for higher level processing and use.

3. c. Retina

4. a. Focusing the light

5. a. True

Check Your Progress 2

1. Principle of proximity states that objects that are close to each other are perceived as a group or unit. This means that when objects are placed near each other, they are perceived as being linked together and forming a comprehensible whole, even if they are not similar in shape, size, color or texture.

2. An icon is a type of sign that represents a physical similarity or resemblance. Or you can say that an icon is a sign that looks like or resembles what it is signifying. For example, a picture of a pen is an icon because it physically looks like a real pen. On the other hand an index is a sign that is directly connected to its referent through a causal relationship or evidence of existence. It means that an index is a sign that points to its referent by virtue of being caused by it or being physically connected to it in some way.

We can understand it with the help of examples. Smoke is an index of fire because it is directly caused by fire. In the same way, tiger's pugmarks are an index of tiger's presence because they are physically connected to the tiger who made them.

Check Your Progress 3

1. Five elements of design are as follows :

i. **Line:** Lines can be used to define shapes, create texture, and communicate movement. They can be straight or curved, thick or thin. We can use

them to create a sense of depth or perspective.

ii. **Shape:** A shape is a two-dimensional form that is defined by its edges and boundaries. Shapes can be geometric (eg, triangle, rectangle, circle, square etc.) or natural (such as trees, flowers, rivers etc.).

iii. **Form:** Form is the three-dimensional equivalent of shape. It refers to the physical or visual mass of an object and we can use forms to convey contrast, depth, or emphasis.

iv. **Colour:** Colour is a powerful visual element for creating mood and emotion in a visual composition. We can use colours to convey meaning, highlight important information, or create contrast.

v. **Space:** Space refers to the area within and around a visual composition/ design. You can use it to create balance, emphasis or depth in a composition.

2. Three principles of design are following :

i. **Principle of Emphasis :** According to this principle, the design should be clear about what is most important. A design should be prepared in such a way that the viewer's eyes go there first. By using this principal we can fulfill the purpose of our design. For example, if in a print advertisement, we want the readers' eyes to go to the new offer given by the company, then we should design it in such a way that the offer is placed at the focal point of the advertisement. The focal point is the part of a design where the viewer's eye first goes. This can be achieved through the use of size, color, contrast or placement.

ii. **Principle of Balance:** Each element in a design/visual composition has a certain visual weight. Visual weight can be understood as the ability of a visual element to attract the attention of viewers. Balance refers to the distribution of visual weight in a design. A balanced design will have equal or proportional visual weight on both sides. Designs can be symmetrically or asymmetrically balanced. We shall discuss this principle in more detail in the next chapter.

iii. **Principle of Unity :** A design is made up of several elements. The principle of unity says that all the elements should come together to create a feeling of completeness. The elements used in the composition should not appear scattered. Together, try to convey a message. A unified design will have elements that work together to create a cohesive whole.

3. c. symmetrically or asymmetrically

4. a. True

UNIT 6: PHOTOGRAPHIC COMPOSITION

Structure

6.0 Introduction

6.1 Learning Outcomes

6.2 What is Picture Composition ?

6.3 Elements of Composition

- 6.3.1 Line
- 6.3.2 Shape
- 6.3.3 Form
- 6.3.4 Texture
- 6.3.5 Space
- 6.3.6 Colour

6.4 Rules of Composition

- 6.4.1 Content and Meaning
- 6.4.2 Emphasis
- 6.4.3 Rule of Thirds
- 6.4.4 Balance
- 6.4.5 Headroom and Lead room
- 6.4.6 Framing
- 6.4.7 Viewpoint

6.5 Let Us Sum Up

6.6 Further Readings

6.7 Check Your Progress: Possible Answers

6.0 INTRODUCTION

In previous units, we discussed the structure of photographic cameras, their functioning and their different types. In photography, it is necessary to know the camera because it is the tool through which photographs are taken. Camera is important but content is the most important. Like every medium, in photography also, we want to convey a certain message to our receivers through photographs. Every photo taken has a purpose. It contains a message that the photographer wants to convey to his/her audience. A good photograph is one that effectively communicates the photographer's intended message to the viewers.

A photographer composes his/her photograph according to the message that s/he wants to convey. Photograph is a visual medium and contains many elements. A good composition can be made by using all these elements properly. Hence, composition is a vital factor in photography. In this unit, we shall discuss various aspects of picture composition. Various elements and some key rules of composition will be discussed here in detail.

6.1 LEARNING OUTCOMES

After going through this Unit, you will be able to:

- understand the importance of composition in photography;
- explain the different elements of composition;
- describe the key rules of composition; and
- improve your photographic composition skills.

6.2 WHAT IS PICTURE COMPOSITION ?

What is the purpose of photography? Just like writing, painting and many other forms of expression, photography is also an art form used to express one's feelings, emotions, stories and messages. Photographers use this medium to express themselves. It is a tool of visual communication and has its own visual language. A good photographer should be the master of visual language. S/he must know the complete grammar of this language so that s/he can use it to convey his/her message properly.

A photograph consists of several elements. It can have shapes, forms, space, colours, textures, sense of movement and many more. A photographer uses these elements creatively to tell his/her story effectively. In photography, composition is structuring a photograph by using various visual elements to convey the intended message effectively.

In simple words, a photographer has many visual elements to structure a photograph, like - main subject/s, things of different shapes and sizes present in the foreground and background, space, colour, texture, etc. A picture is formed from these very elements. A photographer carefully arranges or combines these visual elements within a frame in such a way that s/he can get the best visual result and convey his/her message successfully. The arrangement of these elements to create an effective photograph is called composition. Changes in composition can also be done during post-production, but this work is mainly done at the time of clicking photographs.

Before discussing composition further, we must clearly understand one thing that photographs can be both - unstaged and staged. Unstaged photographs are photographs whose visual elements were present in the same arrangement in real life at the time the photograph was taken. On the other hand in staged photographs, the photographer arranges various visual elements by himself or herself so that s/he can take a good photograph. Here, the photographer creates this arrangement for clicking photos only. Now we shall discuss the different elements of composition.

6.3 ELEMENTS OF COMPOSITION

As we discussed earlier, a photograph is formed by the combination of different visual elements. Different visual elements create different types of feelings, emotions and reactions in our minds and accordingly they are used to create the desired effects. It is necessary to know these elements. If we get to know these elements, we shall be able to use them better in composing our photographs. Here, we shall discuss some important composition elements.

7.3.1 Line

We all know about line. It is one of the most fundamental elements of visual arts. If you observe, you will find this world filled with different types of lines. Different types of lines evoke different feelings in our mind and a good photographer can use them effectively in his/her composition.

Lines are formed when boundaries emerge between different colours or tones. The strength of a line depends on the contrast between colours or tones. Lines can be explicit or implied. An implied line can be formed by the arrangement of different objects or suggested by motion within the frame. Lines can divide the frame or can connect different objects within the frame. Strong lines can be used to draw attention to certain subjects in a photograph. The general pattern of lines can create an interesting effect in a picture. Well-spaced parallel lines have the most calm and stable effects whereas multiple short lines angled in all directions evoke confusion, excitement, and chaos. Photographs with long, angled converging lines quickly attract our eyes to the point of convergence.

We all are familiar with different types of lines, for example – horizontal lines, vertical lines, diagonal lines, curved lines, etc. These lines help to create different types of psychological effects and we can use these properties to compose effective photographs. Horizontal lines create a sense of tranquility, relaxation and gravity. Vertical perpendicular lines may show the feeling of grandeur. They can overpower adjacent horizontal lines. Combination of vertical (perpendicular) and horizontal lines provides the sense of stability and permanence. Diagonal lines indicate motion and instability. As far as curved lines are concerned, they also create different feelings. Soft and shallow curves carry pleasing and sensual qualities. They bring softening effects in composition. But, deep curves, angular or complicated lines create the sense of anger, stress and disorder.

Photo by Poonam Gaur

Figure 1: Curve line

6.3.2 Shape

Shape is more complex than a line. It has two dimensions - length and width. A shape is formed when a line or lines close off a certain area. Shapes help to

single out objects from their environment. If you observe, you will find different types of shapes around you. In photographic composition, the shapes may be real as well as implied. Sometimes a group of objects or shapes makes different shapes by their arrangements. Some common shapes are triangle, rectangle, square, circle, ellipse etc.

Like all visual elements, shapes also have psychological meanings. Different shapes evoke different feelings. Therefore, we can use different shapes in our composition to create the desired effect on the minds of our viewers.

Triangle is a dynamic and energetic shape. It conveys motion and direction, but the position of triangle can change its meaning. An upright triangle sitting on its base shows sense of balance and stability whereas a reverse triangle suggests risk and sense of tension. Rectangle and square shapes convey the feelings of stability, reliability, security and strength. Rectangle is considered comparatively more interesting than square. Round shapes like circle, oval and ellipses do not have angles so they create softness and mildness in the composition. They indicate eternity, completeness and mystery. Arrangement of objects in a circular shape also creates interest.

6.3.3 Form

Forms are three-dimensional shapes. Apart from length and width, they also have depth. For example – square is a shape which has only two dimensions. When a third dimension is added to a square, it will become a cube, a form. So, forms are shapes with volume. Three-dimensional forms can be shown in a two-dimensional photograph through tone gradation (shading). The common forms are - cube, cuboid, cylinder, sphere, cone, pyramid, etc. Our world is full of forms. If you observe properly, you will find many interesting forms around you even in your vegetable box. Try to see it from different point of views and many a time you can get very interesting photographs from ordinary and familiar forms.

Check your progress: 1

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is composition in photography?

.....

.....

.....

2. Differentiate between staged and unstaged photography.

.....

.....

.....

3. Which of the following is not an element of composition ?

   a. Line

   b. ISO

c. Form

d. Shape

4. An upright triangle sitting on its base shows a sense of _____.

a. Stability

b. Risk

c. Tension

d. Softness

5. Horizontal lines create the sense of _____.

a. Confusion

b. Chaos

c. Tranquility

d. Conflict

6.3.4 Texture

Texture is related to the quality of a surface. It suggests how we feel when we touch an object. It can be smooth, rough, sticky, furry, grainy, hard, soft and many more. There is a difference between the texture of the soft and tight skin of a child and the wrinkled skin of an old person. Similarly, there is a difference in the texture of the creamy surface of a cake and the texture of a broken wall. Texture can be used for many purposes in photography. Many times only capturing a texture can give you very interesting photographs. If you observe carefully, you will find many interesting textures in nature. In photography, textures can be used to create visual interest, to balance the composition visually, and to create contrast in the picture.

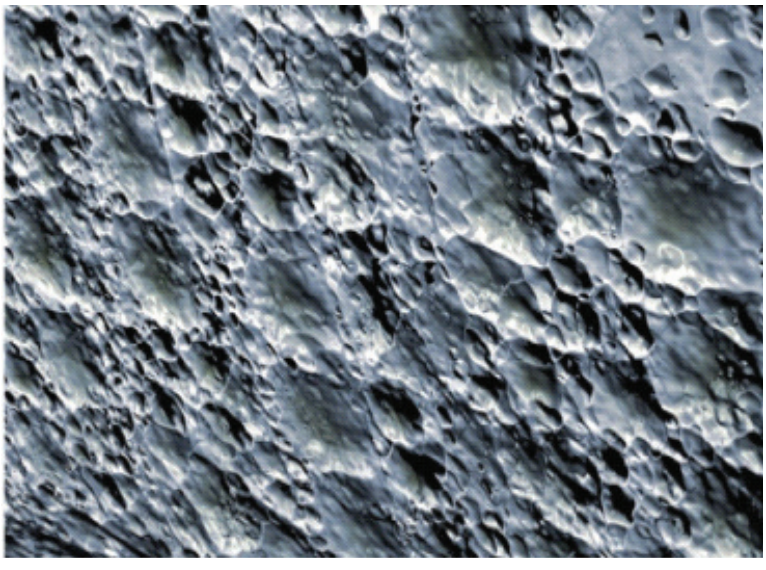


Image Source: Photo by Rajesh Misra (License: CC0 Public Domain) https://www.publicdomainpictures.net/pictures/280000/velka/rock-texture-1.jpg

Figure 2: Rock texture

6.3.5 Space

Space in a photographic composition can be classified into two types - positive and negative space. Generally, positive space is an area that has relatively

higher visual weight in any composition, and the space around a positive space can be called negative space. We can understand it with an example. Just take an example of the following picture (figure no. -3). In this picture, the space covered by the flower is positive space while the rest of the background is negative space.

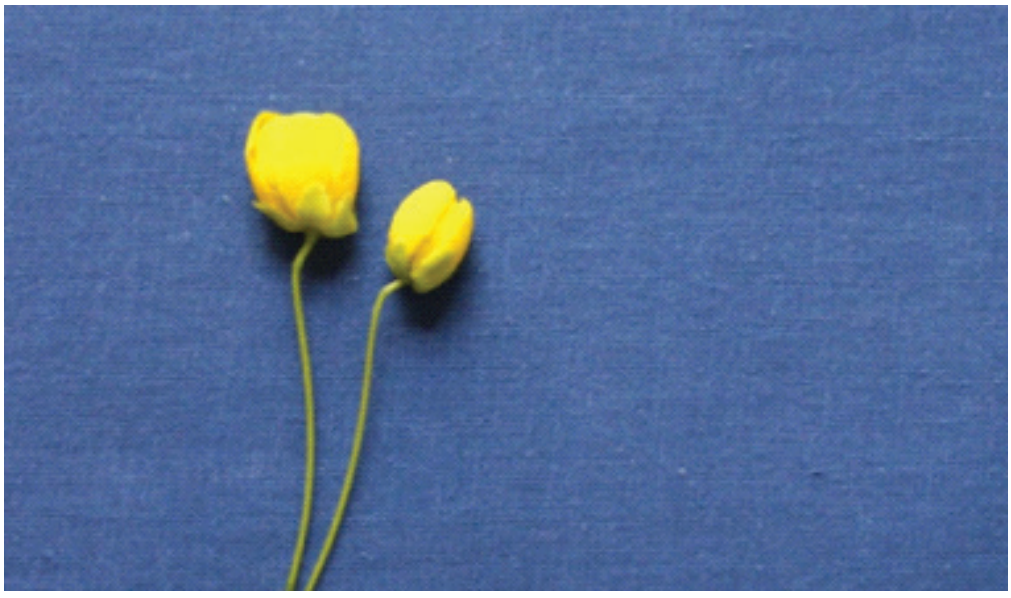


Photo by Poonam Gaur

Figure 3: Positive and negative space

Space can be used creatively to make an effective composition. The relative proportion of positive and negative spaces may change the feeling of the photograph. A tiny positive space with a lot of negative space may create a sense of isolation or vastness. Think about a picture of a small island in a vast sea. Here, the island will be considered as positive space and seawater as negative space. If the size of the island is very small in the composition, it shows the isolation of that island and immensity of the sea. But, if we increase the size of the island in the frame, it will change the proportion of positive and negative spaces and in turn the feel of the photograph may change. Sufficient negative space also provides rest to the eyes and gives a feeling of relaxation.

6.3.6 Colour

Colour is another important element for all visual arts including photography. Colours play an important role in determining the emphasis and mood of a composition. With the help of colours, you can decide the direction of eye movement of the viewer in a picture. Changing tone value of the colour creates the visual perception of distance. Colours also have psychological meanings. The creative use of colours is an important tool for producing an attractive composition and if you want to get command on this tool, you should know the various properties of this element.

Properties of Colour

There are three main properties of colour- Hue, Value and Intensity.

Hue: Hue refers to the colour itself. It is the name of a colour, like – red, blue, green, etc.

Value: Value refers to darkness or lightness of a colour. We can get darker colours by adding black whereas lighter colours can be produced by adding white. Tints and shades carry different values of a colour.

i. **Tint :** By mixing white in any colour, we can get different tints of that particular colour. For example, take the red colour. Now, by mixing different amounts of white with red, we can create different tints of the red. These tints will be lighter than the original red.

ii. **Shade:** Shades are the opposite of tints. You can get different shades of any Colour by mixing black to it. If we mix different amounts of black in red, we shall get different shades of red. Shades are darker than the original colour.

Intensity or Chroma: Intensity refers to the saturation or purity of the colour. We can change the intensity of any colour by mixing it with grey or its complementary colour (opposite to it on colour wheel).

Colour Models

There are two important colour models:

i. Additive Colour model

ii. Subtractive Colour model

i. Additive Colour model: In this colour model, Red, Green & Blue (RGB) are the primary colours. If we combine the light beams of Red, Green and Blue in equal parts, we get the White. Here, all the colours are created by using the primary colours, RGB. In all cases where we see emitted light, additive colour model is used. For example - television monitors, computer monitors, phone screens, tablet screen, etc.

By SharkD at English WikipediaLater versions were uploaded by Jacobolus at en.wikipedia. - Transferred from en.wikipedia to Commons., Public Domain, https://commons.wikimedia.org/w/index.php?curid=2529435

(Figure 4: Primary colours of additive colour model)

When we add two primary colours of this model, we get secondary colours. It is a noticeable fact that these secondary colours work as primary colours in Subtractive Colour Model.

Red + Green = Yellow

Red + Blue = Magenta

Blue + Green = Cyan

ii. Subtractive Colour model : In this colour model, Cyan, Magenta and Yellow are the primary colours. When we mix these colours in equal parts, we get the Black. This colour model is used in the cases where we see the reflected light. For example – printed material, painting, etc.

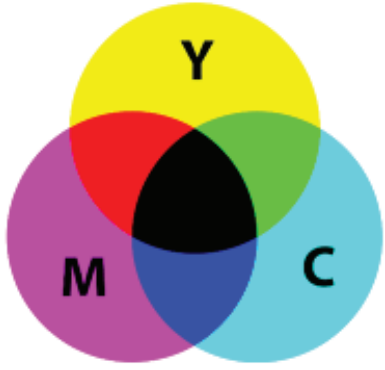


Image source: By SharkD - Own work, CC0, https://commons.wikimedia.org/w/index.php?curid=57505814

Figure 5: Primary colours of additive colour model

We can get secondary colours of this model by mixing the primary colours. Secondary colours of this model work as primary colours of Additive colour model.

Yellow + Magenta = Red

Yellow + Cyan = Green

Magenta + Cyan = Blue

Warm and Cool Colours

Colours can also be divided into two categories - warm and cool colours. Yellow, orange and red are considered warm colors, while blue, green and violet as cool colors. Warm colors are active, aggressive and create a feeling of warmth while cool colors are considered receding and passive. They evoke cool feelings and remind us of cool things like water, grass, etc.

Colour Wheel

It is a wheel on which colours are arranged in a circular manner. This wheel helps us to understand the relationships and interaction between colours. The first such wheel was created by the famous scientist Sir Isaac Newton in 1666. He created the colour wheel to explain that the white light is a combination of seven different colours. Thus his colour wheel had seven colours. After that many versions of colour wheel have emerged. At present the most popular colour wheel carries 12 colours.

Colour Schemes

Colour scheme refers to the combination of colours in a composition. Different colours interact with each other and create different effects. So, a combination of colours can be used to create the desired mood and effects in a photograph. Various colour schemes can be created with the help of colour wheel. Here we shall discuss a few important colour schemes.

i. Monochromatic Colour Scheme: This colour scheme is based on single hue/colour. In this scheme, different tints, shades and tones of the same colour are used. It gives an elegant and clean composition which is soothing and pleasant to the eyes. Example -A picture of a woman in a blue gown standing in a room and all the furniture, curtains and things in that room are of blue colour (different shades, tints and tones of blue).

ii. Complementary Colour Scheme: This scheme uses combination of the complementary colours. The colours which are opposite to each other on colour wheel are called complementary colours. The interaction between complementary colours creates a great contrast, so these colours are also called contrast colours. For example, in traditional RBY colour wheel, Red and Green, Blue and Orange, Yellow and Violet were considered as the complementary colours. But in modern colour wheel, Red and Cyan, Green and Magenta, Blue and Yellow are used as complementary colours. Contrast is the key feature of this colour scheme which attracts the viewers' attention. Example – The photograph of a red flower with the green background of the leaves.

Photo by Poonam Gaur

Figure 6: Complementary colour scheme

iii. Analogous Colour Scheme: In this colour scheme, we use a combination of colours which are placed adjacent to each other on colour wheel. This scheme creates calm and pleasant effects. You can find many examples of this colour scheme in nature. Following image (figure - 7) is an example of analogous colour scheme.

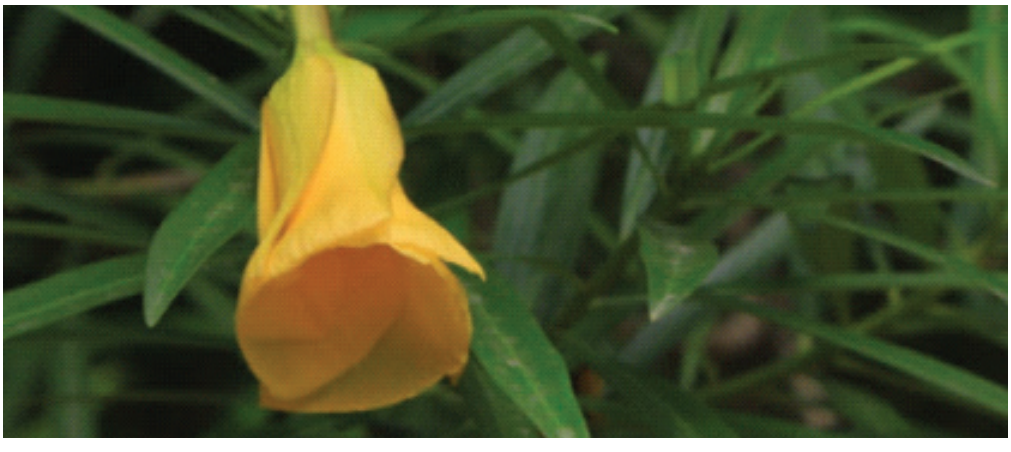


Photo by Poonam Gaur

Figure 7: Analogous colour scheme

iv. Triadic Colour Scheme: This colour scheme uses three colours evenly placed on the colour wheel like – red-yellow-blue, orange-green-violet, etc. Triadic scheme is vibrant but not very aggressive.

Activity 1

Try to compose two photographs, one with complementary colour scheme and another with analogous colour scheme. Show them to any five persons and record their feelings and views on both the photograph. Analyse the recorded data and write it down to highlight the differences between complementary colour scheme and analogous colour scheme.

Check your progress: 2

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. How is the Additive colour model different from the Subtractive model?

.....

.....

.....

2. Define positive and negative space.

.....

.....

.....

3. Which of the following is not a primary colour in Additive colour model?

   a. Red

   b. Green

   c. Yellow

   d. Blue

4. Different tints of a colour can be created by mixing _____ with that colour.

   a. Black

   b. White

   c. Red

   d. Blue

5. Which of the following is a warm colour ?

   a. Blue

   b. Red

   c. Green

   d. Violet

6.4 RULES OF COMPOSITION

The rules of composition generally apply to all types of visual arts and photography is one of them. The main objective of these rules is to help to compose such photographs which can convey the intended messages effectively to the audience. In this section, we shall discuss some of the important rules of photographic composition.

6.4.1 Content and Meaning

This is the most basic but very significant rule of composition. We should compose a photograph in such a way that it can convey the intended meaning successfully. Every photograph has two basic components – Content and Visual Appearance. Content is related to the message or meaning a photographer wants to convey through his/her picture. If a photograph is visually very attractive but is not able to convey the message that the photographer wants, then it cannot be called a good composition. Let us understand it with a simple example.

Suppose you got the opportunity to speak as a guest speaker at a major function of a prestigious institution. The photographer took a picture of the occasion. The picture looks quite nice visually. The lighting is good, the camera angle is also good and your personality also comes out strongly and attractively in the picture. But it is not possible to know from the picture where or in which programme you are speaking. Can the composition of this picture be considered good? Certainly not, because the purpose of this picture was to show that you were speaking in a big programme of a very reputed institution, but the picture does not tell anything about the institution or programme. While composing this picture, it was necessary to be kept in mind that we should include something in the frame to show where the person is speaking. It could have a background banner, an institution logo on the podium or something else to establish where you are speaking. From this simple example, we can understand that before pressing the shutter button of the camera, we must think whether this composition will fully convey the intended meaning of this photograph or not.

In photography, meaning can be created in different ways. The facial expressions of the subject/s can create meaning. We can also create certain meanings by arranging subjects/objects or composition elements in different ways in the frame. For example, if we place two individuals together, one very poor and malnourished and one rich and overweight, then it depicts the sense of inequality in society.

6.4.2 Emphasis

A photograph has many elements and there is a conceptual hierarchy among them. It means that for conveying the intended message effectively, different elements have different levels of importance. Generally, there is one main element on which we want to draw the attention of our viewers most. Other elements of that picture supplement or support the main element. So, the principle of emphasis says that the conceptual hierarchy should match the visual hierarchy because the movement of our eyes follows the visual hierarchy. We should keep the main element of the photograph at the point of the strongest emphasis or the centre of interest.

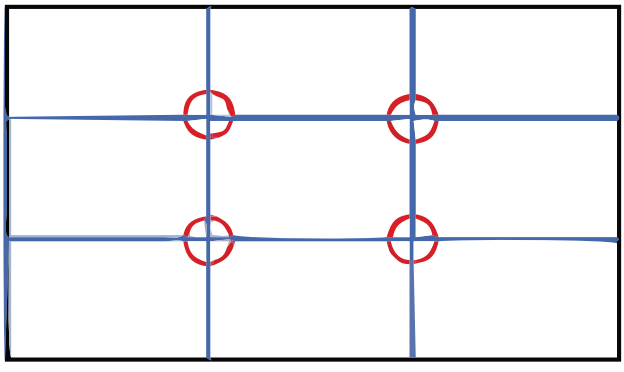
Visual weight plays crucial role in creating emphasis in a composition. The different elements of composition have different visual weight. For example,

darker colours have more visual weight than the lighter colours, bigger shapes have more visual weight than smaller shapes, positive space has more visual weight than negative space, etc. An area with the maximum visual weight will be the area of the strongest emphasis or centre of interest in a composition. Generally, we should not have more than one centre of interest or point of emphasis in our composition. It may create confusion for the viewer but many times we break this rule with certain purposes.

There are different guidelines or rules to create correct emphasis in composition and these are based on human psychology. Rule of Thirds is one of the most popular emphasis rules. We shall discuss this rule in coming sub-section.

6.4.3 Rule of Thirds

Rule of Thirds is a very popular rule of photographic composition. First, divide the whole frame into three equal vertical and horizontal sections with the help of two equally spaced vertical and two horizontal lines. Now the whole frame has nine equal parts and four intersection points. These intersection points are points of interest. The following image (figure no. 8) explains it.



(Figure 8)

According to the Rule of Thirds, to get a good composition, you should follow the guidelines given below.

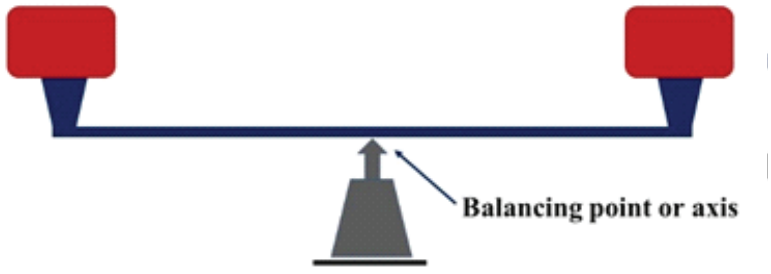
- While composing a picture, imaginarily divide your frame into nine equal parts as described above. Many cameras have feature of enabling Rule of Thirds grid overlay. You can use it. It will help you to place your composition elements according to this rule.
- You should place your main composition elements along these dividing lines or intersection points.
- If your composition has strong horizontal line, do not place it in the middle of the frame. It will divide the frame into two equal parts which will create less interesting visual appeal. Place this horizontal line along any horizontal dividing lines of the grid of Rule of Thirds (either 1/3rd or 2/3rd of the frame).
- If your composition has strong vertical line, do not place it in the middle of the frame. It will divide the frame into two equal parts which will create less interesting visual appeal. Place this vertical line along any vertical dividing lines of the grid of Rule of Thirds (either 1/3rd or 2/3rd of the frame).

  Image no. 3, 6 and 7 follow the Rule of Thirds.

6.4.4 Balance

A photographic composition should be visually balanced. As a photographer, you should distribute the visual weight across the frame in such a way that the entire composition looks balanced and complete. You are familiar with the term 'Visual Weight'. We have discussed this term in the previous section. It is the perceived weight of a visual element that provides the ability to attract the viewer's eye and attention. You can balance your composition in various ways. Here, we will discuss few important types of balance.

Symmetrical Balance: In symmetric balance, we place equal visual weights at equal distances on both sides of the balancing point or axis and the balancing point lies in the middle of the frame. The following image (figure no. 9) explains the symmetrical balance.



(Symmetrical Balance)

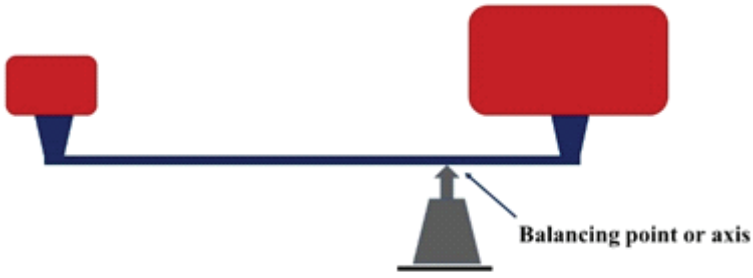
(Figure 9)

Symmetrical balance looks quite formal so it is also called formal balance. This type of balance is relatively less interesting but can sometimes give excellent compositions. Following picture is an example of symmetrical balance.

Photo by Devansh Goel / CC BY-SA (https://creativecommons.org/licenses/by-sa/3.0) https://commons.wikimedia.org/wiki/File:Qutb_Minar-_Symmetry.JPG

Figure 10: Symmetrical balance

Asymmetrical Balance: Obtaining asymmetrical balance in a photographic composition is comparatively difficult but gives interesting and dynamic compositions. Here, we do not place the same visual weight on both sides. We try to balance visually heavy elements with lighter ones. The following image (figure-11) shows the concept of asymmetrical balance.



(Asymmetrical Balance)

(Figure 11)

You should try to balance your compositions asymmetrically. It will make your photographs more interesting and energetic. You can also apply the Rule of Thirds to achieve this balance. Figure 3, 6 & 7 are the examples of asymmetrical balance.

6.4.5 Headroom and Lead room

Headroom and lead room are two important factors in photographic composition. In this sub-section we shall discuss about them.

Headroom: The distance between the subject's top and top of the frame is called headroom. You should keep proper headroom while composing any subject. Too much headroom and no headroom, both should be avoided. Both are not proper and do not look natural. Following pictures (figure no. 12) explain the rule of proper headroom in a photographic composition.

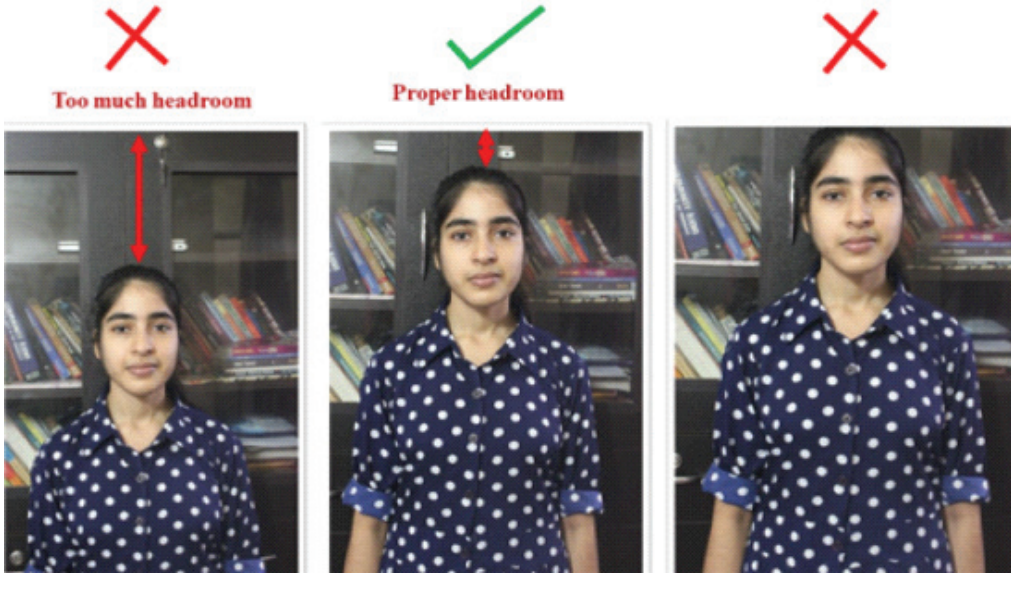


Photo by Amit Kumar

Figure 12: Headroom

Lead room: In good composition, we should leave proper space in the direction in which the subject is moving or facing. This space is called lead room or nose room or looking space. Psychologically viewers want to see proper lead room in any composition. You can also apply the Rule of Thirds to set proper lead

room in your composition. Following pictures (figure no. 13) demonstrate the concept of proper lead room.

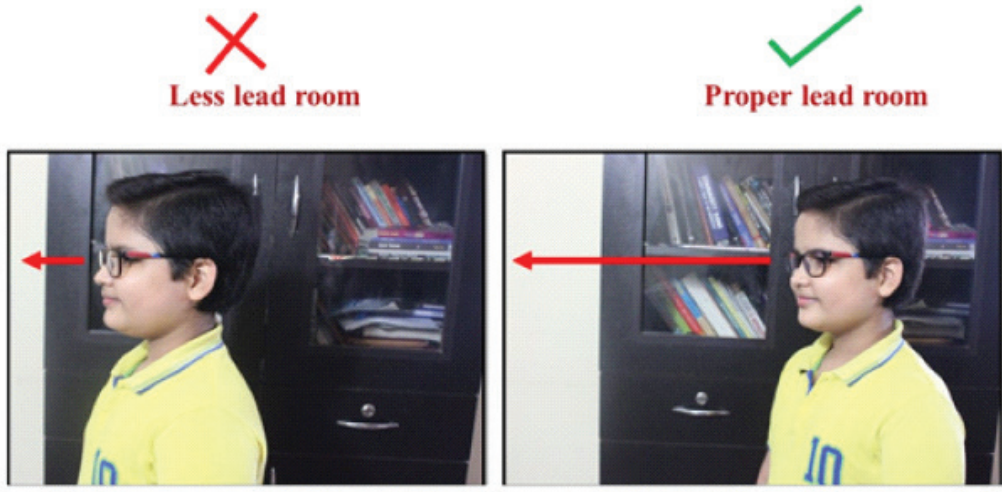


Photo by Amit Kumar

Figure 13: Lead room

6.4.6 Framing:

Framing helps to highlight the framed subject in a photographic composition. We can use different elements of our composition to create a frame within the frame. For example, we can capture a bird through the natural frame of tree branches. Curtains, tunnels, arches, windows, doors, the gap between the rocks and many more can be used to create a frame within the frame. Using this framing technique, we can add a sense of depth to our photograph and also highlight the framed subject. Following image (figure no 14) is an example of this types of framing.

Photo by Poonam Gaur

Figure 14: Framing

6.4.7 Viewpoint

Viewpoint plays a very important role in photographic composition. It refers to the position of the camera lens in relation to the captured subject/s. As a photographer you should look at your subject from different angles and then

decide the right viewpoint to shoot. You can get very interesting pictures of common things by changing your point of view. By changing the camera angle, you can change the viewpoint and as a result, perspective will also change. You can try to click pictures of the same subject from different angles, such as - eye level, low angle, high angle, bird's eye angle, worm's eye angle, etc. You will get different results every time. We will discuss all these angles in detail in other units. So, always try to see and shoot your subject from different points of view, you will get interesting results.

6.5 LET US SUM UP

Composing a photograph is a creative work and we cannot restrict it to the boundaries of certain rules. In creative fields, the best rule is 'no rule'. You can break the rules but before that, you must know and master the rules. The same thing is applicable to photographic composition. The rules of composition are based on human psychology and give good results. In this unit, we discussed the main elements and fundamental rules of photographic composition. If you want to be a good photographer, just pointing and shooting is not enough. Your every click should be thoughtful.

Activity 2

Compose four photographs using the Rule of Thirds.

Check your progress: 3

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. Explain Rule of Thirds.

.....

.....

.....

2. How is symmetrical balance different from asymmetrical balance ?

.....

.....

.....

3. What is visual weight ?

.....

.....

.....

4. If your composition has a strong horizontal line, you should place it in the middle of the frame.

   a. True

   b. False

5. In Rule of Thirds, the whole frame has _____ equal parts and _____ intersection points.

   a. 8, 4

   b. 9, 4

   c. 9, 3

   d. 4, 4

6.6 FURTHER READINGS

Duchemin, D. (2015). *The Visual Toolbox: 60 Lessons for Stronger Photographs. Pearson Education.*

Freeman, M. (2007). *The photographer's eye: composition and design for better digital photos. CRC Press*.

Langford, *M., Fox, A., & Smith, R. S. (2013). Langfords basic photography: the guide for serious photographers. Amsterdam: Focal Press/Elsevier.*

6.7 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check your progress: 1

1. A photographer has many visual elements to structure a photograph, like - main subject/s, things of different shapes and sizes present in the foreground and background, space, colour, texture, etc. A picture is formed from these very elements. A photographer carefully arranges or combines these visual elements within a frame in such a way that s/he can get the best visual result and convey his/her message successfully. The arrangement of these elements to create an effective photograph is called composition.

2. Unstaged photographs are photographs whose visual elements were present in the same arrangement in real life at the time the photograph was taken. On the other hand, in staged photographs, the photographer arranges various visual elements by himself or herself so that s/he can take a good photograph. Here, the photographer creates this arrangement for clicking photos only.

3. b. ISO

4. a. Stability

5. c. Tranquility

Check your progress: 2

1. In Additive Colour model, Red, Green & Blue (RGB) are the primary colours. If we combine the light beams of Red, Green and Blue in equal parts, we get White. Here, all the colours are created by using the primary colours, RGB. In all cases where we see emitted light, additive colour model is used. For example - television monitors, computer monitors, phone screens, tablet screen, etc. When we add two primary colours of this model, we get secondary colours. It is a noticeable fact that these secondary colours work as primary colours in Subtractive Colour Model.

In Subtractive Colour model, Cyan, Magenta and Yellow are the primary colours. When we mix these colours in equal parts, we get the Black. This colour model is used in the cases where we see the reflected light. For example – printed material, painting, etc. We can get secondary colours of this model by mixing the primaries. Secondary colours of this model work as primary colours of Additive colour model.

2. Positive space is an area that has relatively higher visual weight in any composition, and the space around a positive space can be called negative space. Think about a picture of a small island in a vast sea. Here island will be considered as positive space and seawater as negative space.

3. c. Yellow

4. b. White

5. b. Red

Check your progress: 3

1. Rule of Thirds is a very popular rule of photographic composition. First, divide the whole frame into three equal vertical and horizontal sections with the help of two equally spaced vertical and two horizontal lines. Now the whole frame has nine equal parts and four intersection points. These intersection points are points of interest. You should place your main composition elements along these dividing lines or intersection points.

2. In symmetric balance, we place equal visual weights at equal distances on both sides of the balancing point or axis and the balancing point lies in the middle of the frame. Symmetrical balance looks quite formal so it is also called formal balance. This type of balance is relatively less interesting but can sometimes give excellent compositions.

   In asymmetrical balance, we do not place the same visual weight on both sides. We try to balance visually heavy elements with lighter ones. Achieving asymmetrical balance in a photographic composition is comparatively difficult but gives interesting and dynamic compositions.

3. It is the perceived weight of a visual element that provides the ability to attract the viewer's eye and attention. Visual weight plays crucial role in photographic composition. The different elements of composition have different visual weight. For example, darker colours have more visual weight than the lighter colours, bigger shapes have more visual weight than smaller shapes, positive space has more visual weight than negative space, etc.

4. b. False

5. b. 9, 4

UNIT 7: PHOTOGRAPHY TECHNIQUES

Structure

7.0 Introduction

7.1 Learning Outcomes

7.2 Exposure

7.2.1 Exposure Triangle

7.3 Depth of Field

7.4 Aperture

7.4.1 Aperture and Exposure

7.4.2 Aperture and Depth of Field

7.5 Shutter Speed

7.5.1 Shutter Speed and Exposure

7.5.2 Shutter Speed and Motion

7.5.3 Creative Use of Shutter Speed

7.6 Let Us Sum Up

7.7 Further Readings

7.8 Check Your Progress: Possible Answers

7.0 INTRODUCTION

In the previous units, we discussed the different types of cameras, their structure, functioning and composition. In this unit we shall discuss some techniques of photography. Aperture, shutter speed and ISO play important roles in photography. By using these, we can click different types of photographs. Exposure and Depth of Field will also be discussed in detail in this unit. Understanding the interrelations between aperture, shutter speed and ISO and knowing their uses is important for good photography. We shall see how the required results in photographs can be achieved from different settings of aperture, shutter speed and ISO. Good photography mainly has two requirements: creative thinking and knowledge of techniques. With the combination of these two, we can do better in the art of photography.

7.1 LEARNING OUTCOMES

After going through this Unit, you will be able to:

- understand Exposure and Exposure Triangle;
- describe Depth of Field in photography;
- explain the role of aperture, shutter speed and ISO in photography; and
- improve your photography skills.

7.2 EXPOSURE

We know that in photography, reflected light from an object reaches a light sensitive plate through the camera lens and forms an image of that object there. Earlier photographic film was used as the light sensitive plate, but now an image sensor is used instead. Therefore, in photography, the image is recorded as light signals only. Digital cameras also record the image as light signals first, then the image sensor converts those light signals into electronic signals. Hence, it is clear that light is the base of photography. Exposure is also related to light itself.

In simple words, the exposure is the amount of light that reaches the image sensor through the camera lens while taking the picture. The longer the image sensor of the camera is open for light to come in, the greater the amount of light that will reach inside. Exposure also depends on many other things which we will discuss later. This amount of light should always be appropriate, i.e. neither more than required nor less than required. When the amount of light in a photograph exceeds the requirement, we call it overexposed and if the amount of light is less than the required, it is called underexposed.

Now the question arises that how should the correct exposure be determined? It is difficult to give one correct answer to this question. Although it can be said that the right exposure is one that is very close to reality, but sometimes photographers may use the exposure creatively as well. They may deliberately keep the exposure different from the reality.

Most cameras have inbuilt light meters. When you point the camera towards the subject, the light reflected from the subject comes inside through the lens and the light meter measures its intensity. With the help of this light meter you can find the exposure level on a scale. That is why it is also called exposure meter. So before clicking, the photographer knows the level of the exposure and can make necessary changes in it.

7.2.1 Exposure Triangle

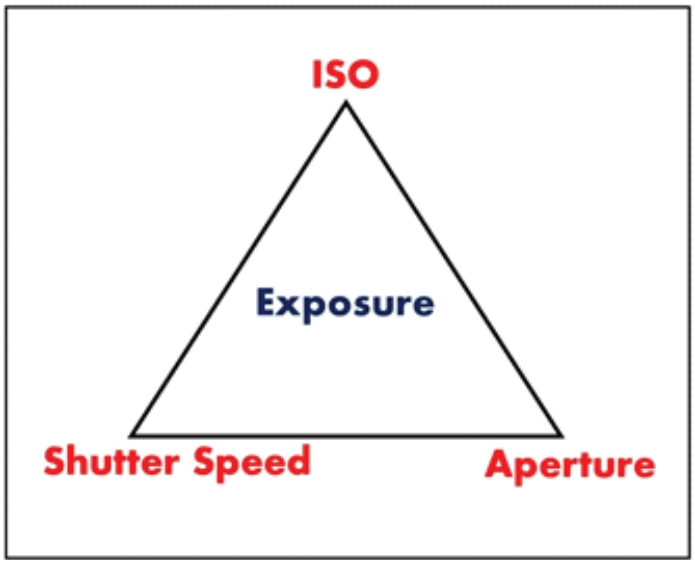
After understanding the exposure, you will definitely want to know how to control it. In photography, exposure is controlled by the following three things or variables:

i. ISO

ii. Aperture

iii. Shutter speed

These three things together form the Exposure Triangle. We shall discuss these three things in some detail now.

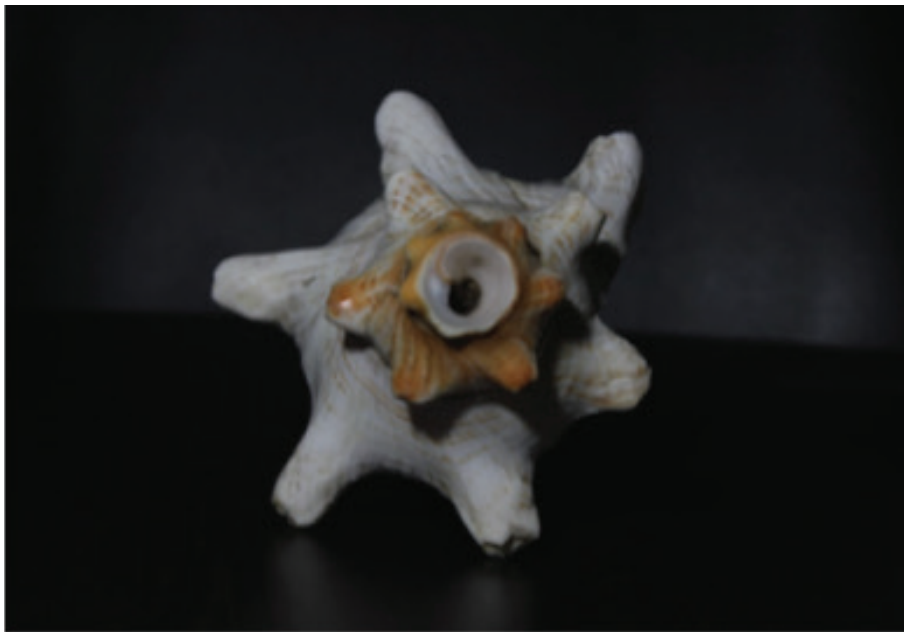


By Amit Kumar

Figure 1: Exposure triangle

i. ISO: ISO is an abbreviation for International Standard Organization. In the context of photography, this is the unit of light sensitivity of a photographic film or image sensor which is accepted all over the world. First, we shall try to briefly understand light sensitivity. Light sensitivity means sensitivity towards light. The thing which is more light sensitive can give better output by getting relatively less amount of light. ISO is denoted by numbers in photography. For example 100, 200, 400, 800, 1600 etc. As the ISO number increases, the light sensitivity also increases. If in case – A, ISO is 100 and in case - B, ISO is 200, then in case B the light sensitivity of the image sensor is twice that of case A.

Now we shall try to understand the interrelationship between ISO and exposure. How does ISO affect exposure? To know the answer of this question, see the three pictures below.



By Amit Kumar

Figure 2, ISO = 100

By Amit Kumar

Figure 3, ISO = 400

By Amit Kumar

Figure 4, ISO = 800

In the first photograph, ISO is 100, in the second it is 400 and in the third 800. All the three photographs have been taken in the same light condition and the rest of the factors affecting the exposure (aperture and shutter speed) have also been kept constant. We can clearly see that as the ISO increases, the amount of light in the pictures also increases. So it is clear that if ISO is increased then the exposure i.e. the amount of light in the picture will also increase and if ISO is reduced then the exposure i.e. the amount of light in the picture will also decrease.

After understanding the interrelationship between exposure and ISO, now it is necessary to discuss the remaining two elements of the exposure triangle. These are aperture and shutter speed. But we will discuss their interrelationships with exposure later. In this unit, there are two separate sections dedicated to aperture and shutter speed, where both of them are discussed in detail. The interrelationships between these and exposure will also be discussed in the same sections.

Activity 1

Put the camera in manual mode. Take four photographs of the same subject with ISO 100, 200, 400 and 800. Keep the aperture and shutter speed constant in all photographs. Compare all four pictures and write your observations. This activity can also be done with smartphone cameras. Many of these cameras have manual or pro mode. If manual or pro mode is not available, then the help of camera apps may be taken.

Check your progress: 1

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is exposure in photography?

.....

.....

.....

2. What are the three elements of Exposure Triangle?

.....

.....

.....

3. In which one of the following cases the image sensor has the highest light sensitivity?

   a. ISO - 100

   b. ISO - 200

   c. ISO - 400

   d. ISO - 800

4. Which of the following is **false**?

   a. If ISO is increased, exposure also increases.

   b. While clicking photographs in low light condition, you can increase ISO.

   c. If ISO is increased, exposure decreases.

   d. ISO is linked with light sensitivity of the image sensor.

7.3 DEPTH OF FIELD (DOF)

Depth of field (DOF) is an important feature in photography and it is necessary for you to understand it. As the name of this term suggests, it talks about the depth of the field. In simple words, depth of field is the depth of an area of a photograph which is in focus. It means, the distance between the nearest and farthest points of the area of the photograph which is in focus. Now the question is what does it mean for an area of the photograph to be in focus? The area of a photograph that is with reasonably sharp details is called in focus. With the help

of the pictures given below, we can easily understand the depth of field.

By Poonam Gaur

Figure 5: Shallow depth of field

By Poonam Gaur

Figure 6: Deep depth of field

The above pictures clearly show that the depth of field in figure no. 5 is lesser than that of figure no. 6.

The following three factors mainly affect the depth of field:

i. Distance between subject and lens

ii. Focal Length of the lens

iii. Aperture

i. Distance between subject and lens and DOF: If everything else is constant then the depth of field will increase as distance between subject and camera lens increases. And following the same relationship, if the distance between the subject and the lens is reduced, the depth of field will also decrease.

ii. **Focal length of the lens and DOF:** The focal length of the camera lens also affects the depth of field. If the focal length increases, the depth of field will decrease and if the focal length of the lens decreases, the depth of field will increase. For example: if the rest of the factors are kept constant then the depth of field of the photograph taken with a lens of 50 mm focal length will be greater than the photograph clicked with a lens of 100mm.

iii. **Aperture and DOF:** Aperture is also one of the important factors that affects depth of field. But how it affects the depth of field will be discussed in the next section. The next section is completely focused on aperture. Aperture and its role in photography will be discussed in this section. The effect of aperture on depth of field will also be discussed there in detail.

Check your progress: 2

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. Explain the term 'Depth of Field'.

.....

.....

.....

2. Name the factors which affect depth of field in photography.

.....

.....

.....

3. How does focal length influence depth of field?

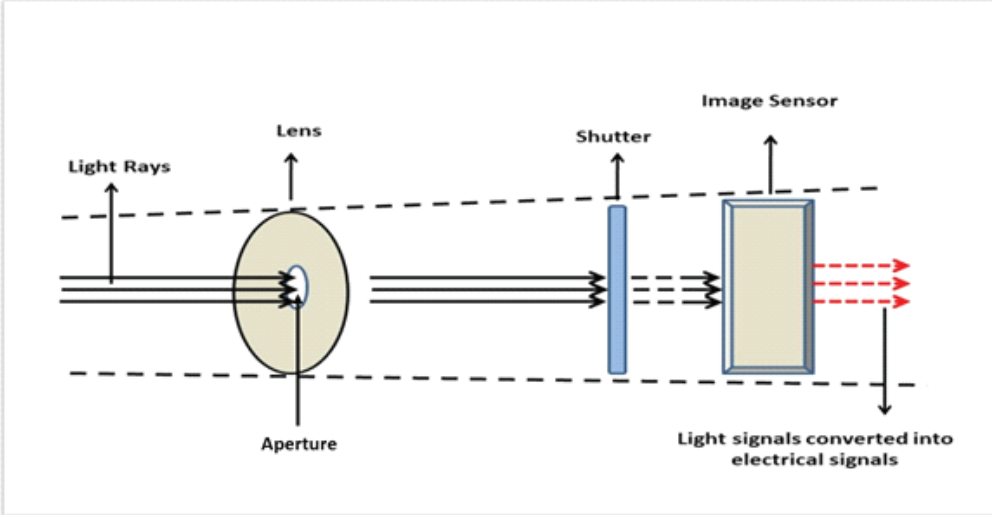
.....

.....

.....

7.4 APERTURE

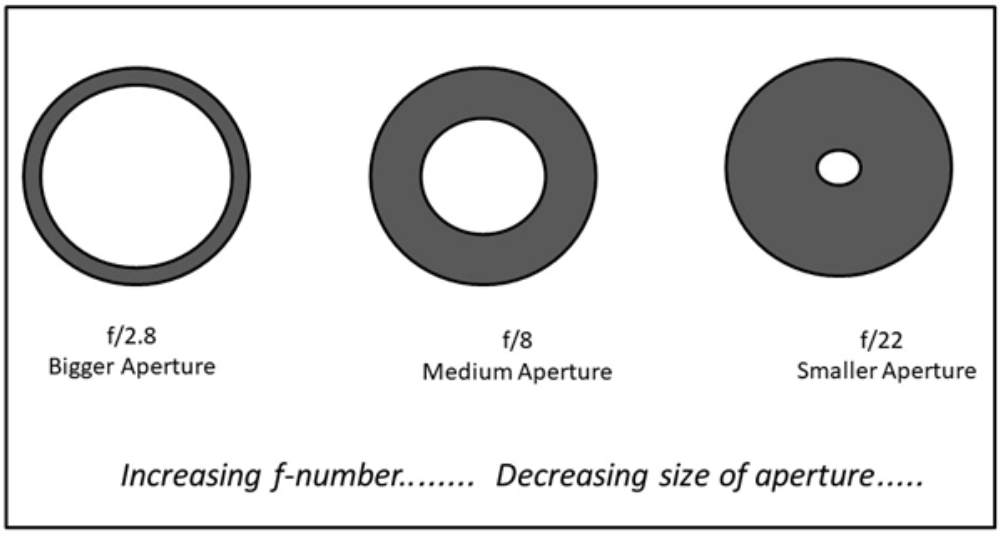
Aperture is a hole or opening of the lens through which light enters the camera. You can change its size. It can be increased or decreased. If you increase its size then more amount of light will enter the camera and if it is reduced then relatively less light rays will be able to enter the camera. The entire amount of light falling on the outer surface of the lens does not cross the lens and go inside the camera. The amount of light that will be able to cross the lens is determined by the size of the aperture itself. The diagram below shows the functioning of a digital camera and we can also get a little clarity on the role of aperture from it.



By Amit Kumar

Figure 7 : Functioning of a digital camera

The size of the aperture is denoted by f-numbers or f-stops. For example: f/1.4, f/2, f/2.8, etc. Here, we should always keep one thing in mind that if the f-number is increasing, it means that the size of the aperture is decreasing. For example: If you compare f /22 and f/8, the aperture size of f/22 will be lesser than that of f/8. The diagram below illustrates this.



By Amit Kumar

Figure 8 : Aperture

From this diagram it is completely clear that when the f-number increases, the size of the aperture decreases. Actually this f-number is based on the following formula:

f-number = lens focal length ÷ effective aperture diameter

If we look at this formula carefully, we will find that f/2 means that we have set the diameter of the aperture to half of the focal length of the lens. Similarly, f /4 means that the diameter of the aperture is one fourth of the focal length of the lens. This formula makes it clear why the size of the aperture decreases as the f-number increases.

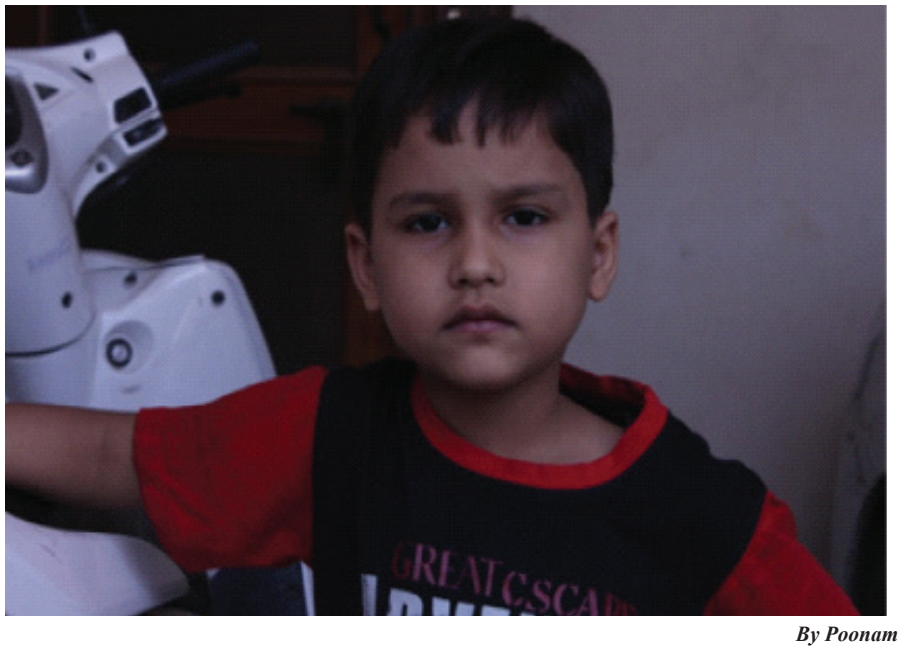
7.4.1 Aperture and Exposure

During the discussion on the exposure triangle, we saw that aperture also affects the exposure. As we know, the aperture is the opening of the lens through which

light comes in, so it is clear that the larger this opening, more will be the light that comes in. Now we can easily understand the relation between aperture and exposure. If size of aperture increases, the amount of light inside the camera will also increase and as a result exposure will increase too. On the other hand, if size of aperture decreases, exposure will also decrease. But here, we should not be confused with f-number and aperture size. We have made it clear that the size of aperture increases as f-number decreases. You will get complete clarity on the relationship between aperture and exposure with the help of following pictures.

By Poonam Gaur

(Figure 9 , Aperture = f/16)



By Poonam Gaur

(Figure 10, Aperture = f/11)

By Poonam Gaur

(Figure 11, Aperture = f/5.6)

These three pictures make it clear that as the size of the aperture is increased (f-number decreased), the exposure also gets increased. Therefore, it is clear that the size of the aperture can be increased to increase the amount of light in the photograph. Lenses of different focal lengths may have different maximum and minimum apertures. In many zoom lenses, you can see that changing the focal length changes the maximum aperture.

8.4.2 Aperture and Depth of Field

Aperture also affects the depth of field. The depth of field reduces when the size of the aperture increases (the f-number decreases). Similarly, the depth of field increases when the size of the aperture decreases (f-number increases).

You can understand the relationship between the aperture and depth of field more clearly with the help of pictures given below.

By Poonam Gaur

(Figure 12, Aperture = f/5.6)

By Poonam Gaur

(Figure 13, Aperture = f/16)

You can see that in figure-12 the size of aperture is larger than the figure-13 and as a result the depth of field is lesser. These examples support the above mentioned relationship between aperture and depth of field.

Check your progress: 3

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is aperture?

.....

.....

.....

2. Discuss the relationship between the size of aperture and f-numbers.

.....

.....

.....

3. How does aperture affect exposure?

.....

.....

.....

4. In which of the following cases, the aperture size is maximum ?

   a. f / 1.4
   b. f / 2.8
   c. f / 22
   d. f / 5.6

7.5 SHUTTER SPEED

See the figure-7 carefully. This diagram explains the functioning of digital cameras. In this, you can see that there is a part called shutter before the image sensor. This shutter is like a curtain in front of the image sensor and opens only when the shutter button of the camera is pressed. As soon as the shutter button of the camera is pressed, this shutter opens for a certain period of time and the rays of light coming through the lens's aperture reach the image sensor and form the image. Then this shutter closes and the light rays stop reaching the image sensor. It means that the rays of light reach the image sensor only for the time that the shutter remains open. This is called Exposure Time.

After discussing the shutter, now we come to the shutter speed. The speed with which the shutter opens and closes is known as the shutter speed. So, if the shutter speed is high, the shutter will remain open for a shorter time and the exposure time will be less. On the other hand, if the shutter speed is slow, the shutter will remain open for longer time and the exposure time will also be longer. Shutter speed is measured in second and fraction of a second. For example : 4, 5, 1/10, 1/125, 1/4000, etc. If the shutter speed is 4, it means shutter will be open for 4 seconds for exposure. 1/10 means shutter will be open for 10th part of a second or 0.1 second and 1/4000 means shutter will be open only for 4000th part of one second.

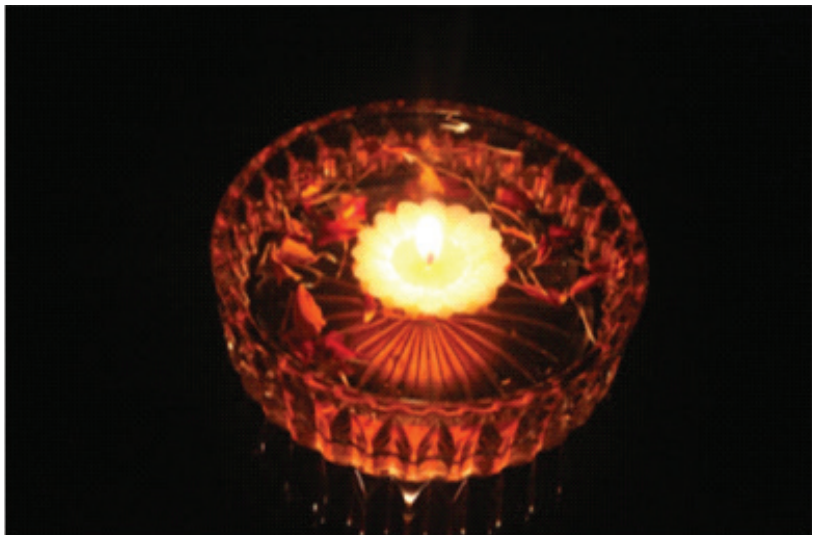
7.5.1 Shutter Speed and Exposure

During the discussion on Exposure Triangle, we saw that shutter speed also affects exposure. Shutter speed determines how long the shutter will remain open, and as long as the shutter will remain open, the rays of light will reach the image sensor. Therefore, it is clear that if shutter is open for a longer time, the exposure will be more. And the shutter will remain open for a longer time only when the shutter speed is slow. So if the shutter speed is slow, the exposure will be high and if the shutter speed is fast, the exposure will be less.

The following pictures explain the relationship between shutter speed and exposure.

By Amit Kumar

Figure 14, Shutter speed = 1/20 sec



By Amit Kumar

Figure 15, Shutter speed = 1/60 sec

By Amit Kumar

Figure 16, Shutter speed = 1/100 sec

Look at the above three pictures carefully. The shutter speed in figure- 14 is the slowest (1/20). Here the shutter was open for twentieth part of a second. The shutter speed in the second image (figure no. - 15) is higher and the shutter speed in image- 16 is the highest (1/100). These pictures show that as the shutter speed increased, the amount of light in the pictures decreased, that is, the exposure decreased. Exposure in figure - 14 is quite high and due to which details are lost. The shape of the flame of the lamp is not visible. Increasing the shutter speed reduced the exposure slightly in figure -15 and led to more details being seen. Increasing the shutter speed further reduced the exposure in figure -16 and improved the details.

Relationship between shutter speed and aperture in the context of exposure:
In the exposure triangle, we discussed that aperture, shutter speed and ISO all three elements affect the exposure. These three elements can be controlled to get the right exposure. In the context of exposure, there is a very simple relationship between shutter speed and aperture that can be easily understood. If the size of the aperture is increased, the shutter speed will also have to be increased. Suppose you have to achieve a particular level of exposure and you have achieved it by a specific combination of aperture, shutter speed and ISO.

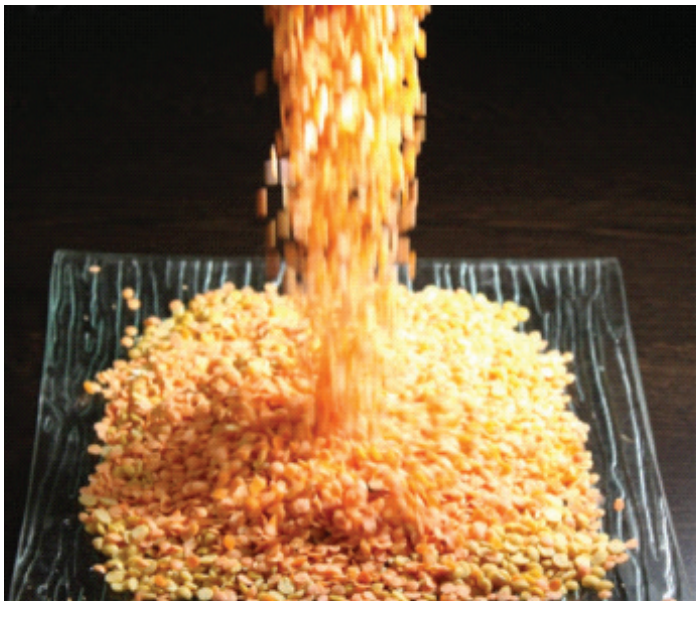
Now, if for some reason you have to increase the size of the aperture, then to maintain the previous level of exposure, you will have to increase the shutter speed also.

8.5.2 Shutter Speed and Motion

Still photographs cannot have motion, but feeling of motion can be created. A picture of a moving object can be taken in such a way that it looks completely still, and can also be taken in such a way that it can show the effects of motion. This effect of motion is also called motion blur. Shutter speed plays a major role in both these tasks. Slow shutter speed brings the feeling of motion, on the other hand, fast shutter speed freezes the action. If we want to click a picture of a moving object in which its movement is completely frozen, we should use fast shutter speed. And if we want to take a picture of a moving object with effect of motion, we have to use slow shutter speed. Following pictures display the relation of shutter speed and motion effects.

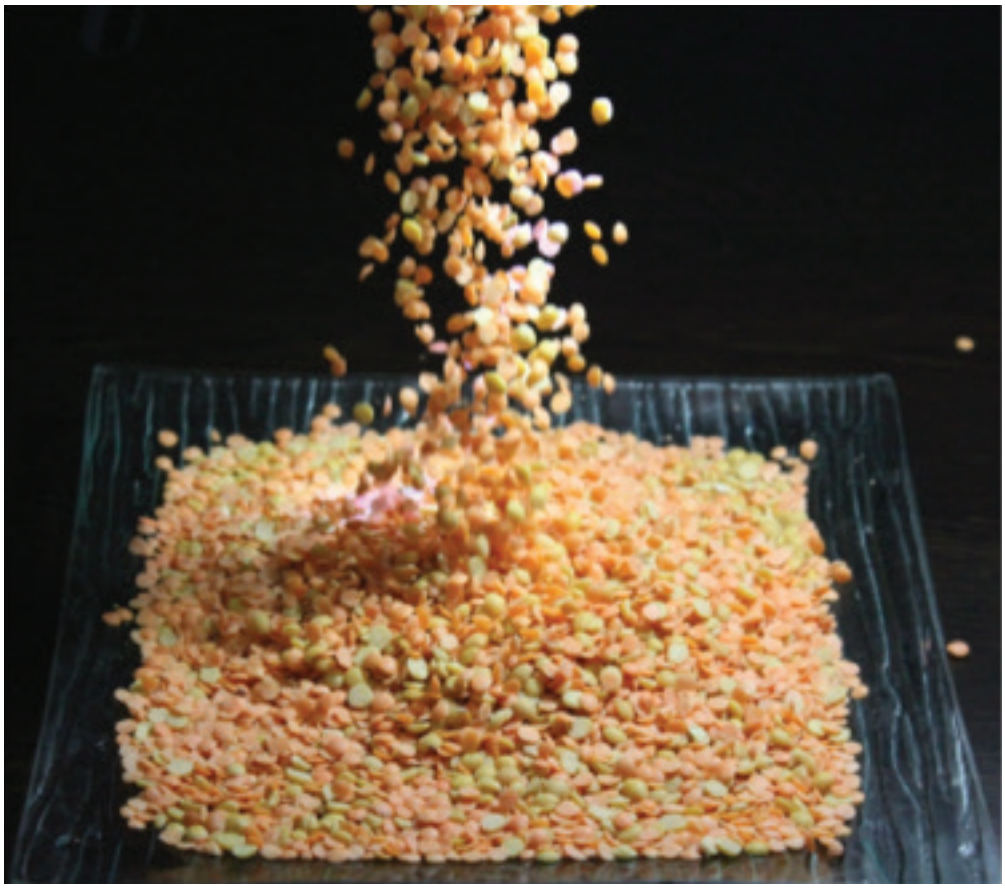
By Poonam Gaur

Figure 17, Shutter Speed = 1/50sec.



By Poonam Gaur

Figure 18, Shutter Speed = 1/200sec.



By Poonam Gaur

Figure 19, Shutter Speed = 1/1000sec.

Here we can see that the shutter speed is the slowest in figure-17 so the motion effect is the smoothest. As we continue to increase the shutter speed, the action is freezing in next two pictures.

7.5.3 Creative Use of Shutter Speed

Creative use of shutter speed in photography can lead to many beautiful and unique photographs. Here, it is necessary to understand that when we slow down or speed up the shutter speed significantly, we also have to change the settings of aperture and ISO to keep the exposure correct. Now we shall discuss some creative experiments of shutter speed.

i. **Freezing the action:** Many a times such pictures of moving objects are quite attractive in which their action is frozen at any given moment. Since our eyes do not normally see these types of frozen actions, they look attractive. We use faster shutter speed to freeze the action. This technique is very popular in sports photography where we try to freeze the actions of players, but it is also used creatively for other purposes. Figure no. 20 and 21 are the examples of freezing action by using faster shutter speed.

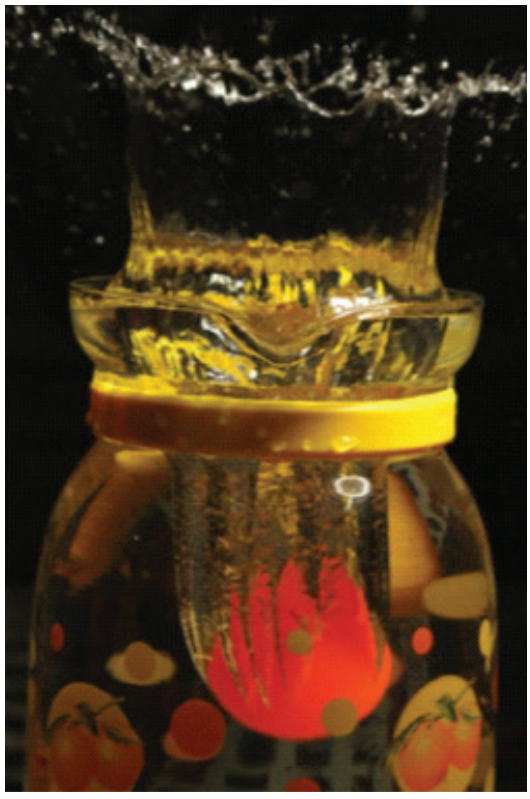


Photo by Amit Kumar

Figure 20, shutter speed =1/1000s

In this picture, a red ball falls into a jar filled with water and because of that the water bounces upwards. Here, the water surge is captured by using fast shutter speed (1/1000s) which looks attractive.

Photo by Poonam Gaur

Figure 21, shutter speed =1/640s

In the picture above, the movement of the sketch pens was frozen with the help of high shutter speed (1/640 Sec).

ii. **Ghost Effect:** Ghost effect is a creative use of slow shutter speed. This effect can be created by the slow shutter speed and the motion blur caused by it. The following picture is an example of ghost effect.

Photo by Amit Kumar

Figure 22 : Ghost effect, Shutter Speed = 4 Sec.

In this picture, shutter speed was 4 second. It means, the shutter was open for 4 seconds. A shadowy character (girl) appears behind the main subject of the picture and creates ghost effect. When the picture was taken, the camera shutter was open for 4 seconds that resulted four second long exposure. The girl seen behind was sitting hidden behind the woman. In the same 4 seconds, the girl, acting as a ghost, got up from behind the woman and came into the frame and sat down again. In slow shutter speed, the girl was in motion, which caused motion blur and created ghost like effect. The rest of the settings (ISO and aperture) and acting were done according to the mood of the picture. It is necessary to keep the camera completely steady while taking a picture with a slow shutter speed, so a tripod should be used.

iii. **Light Painting or Drawing:** Light painting is a photographic technique which is also called light drawing. Slow shutter speed is used in this technique due to which the exposure time becomes longer. We make a design in front of the camera with the help of a light source such as a mobile torch. The shutter speed is kept so slow that the shutter will remain open until the process of making that design ends. Many beautiful photographs can be clicked through this process. Since the shutter speed is very slow in light painting and the exposure time is very long, it is necessary to keep the camera completely stable. Therefore, tripod should be used in this process. Aperture and ISO settings also have to be kept appropriate to keep the exposure correct. Generally this process is done in very low light. Figure number 23 and 24 are examples of light painting or drawing.

By Poonam Gaur

Figure 23: Light painting/drawing, Shutter Speed = 6 Sec.

By Poonam Gaur

Figure 24: Light painting/drawing, Shutter Speed = 8 Sec.

Both the pictures were taken with slow shutter speed of 6 second and 8 second respectively. Tripod was also used. These are just basic examples. You can create many beautiful designs by using this technique.

Activity 2

Click two photographs. In the first, try to freeze any action, and in the second, try to capture the light painting. Compare their shutter speeds and write your observations.

Check your progress: 4

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is shutter speed?

.....

.....

.....

2. How will you freeze any action in photography?

.....

.....

.....

3. What is light painting? Explain the role of shutter speed in it.

.....

.....

.....

4. Which of the following sentences is true ?

   a. If shutter speed is increased, exposure increases.

   b. If shutter speed is increased, exposure time decreases.

   c. Slow shutter speed should be used to freeze the action.

   d. Faster shutter speed helps to create motion blur.

7.6 LET US SUM UP

We know that effective photography requires both content and craft. No one can become a good photographer without good content, but craft also has its own importance. It helps us to present our content in better way. This combination of content and craft plays crucial role in every medium. If we talk about writing, then here too, both content and craft are necessary. A good writer can be the one who has quality content and also excellent writing skills (craft) through which s/he can present his/her content in an effective way. Lack of either one will prevent you from becoming a good writer. The same formula is also applicable in photography.

In this unit, we have discussed a part of the photographic craft. Aperture, shutter speed and ISO are all important tools of photography. Here, we have discussed the uses of these three tools. We have tried to understand how these tools affect exposure, depth of field and motion effects. With the help of correct use of different photographic tools you can present your content more effectively.

7.7 FURTHER READINGS

Kelby, *S. (2012). The digital photography book. Peachpit Press.*

Langford, *M., Fox, A., & Smith, R. S. (2013). Langfords basic photography: the guide for serious photographers. Amsterdam: Focal Press/Elsevier.*

Peterson, *B. (2016). Understanding exposure: how to shoot great photographs with any camera. AmPhoto books.*

7.8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check your progress: 1

1. In simple words, the exposure is the amount of light that reaches the image sensor through the camera lens while taking the picture. The longer the image sensor of the camera is open for light to come in, the greater the amount of light will reach inside.

2. The three elements of Exposure Triangle are following :

   i. ISO

   ii. Aperture

   iii. Shutter speed

3.d. ISO - 800

4. c. If ISO is increased, exposure decreases.

Check your progress: 2

1. Depth of field is the depth of an area of a photograph which is in focus. It means, the distance between the nearest and farthest points of the area of the photograph which is in focus.

2. The following three factors mainly affect the depth of field:

   i. Distance between subject and lens

   ii. Focal Length of the lens

   iii. Aperture

3. If the focal length increases, the depth of field will decrease and if the focal length of the lens decreases, the depth of field will increase.

Check your progress: 3

1. Aperture is a hole or opening of the lens through which light enters the camera. You can change its size. It can be increased or decreased.

2. If the f-number is increasing, it means that the size of the aperture is decreasing. For example: If you compare f /22 and f/8, the aperture size of f/22 will be lesser than that of f/8.

3. If size of aperture increases, the amount of light inside the camera will also increase and as a result exposure will increase too. On the other hand, if size of aperture decreases, exposure will also decrease.

4. a. f / 1.4

Check your progress: 4

1. The speed with which the shutter opens and closes is known as the shutter speed. So if the shutter speed is high, the shutter will remain open for a shorter time and the exposure time will be less. On the other hand, if the shutter speed is slow, the shutter will remain open for longer time and the exposure time will also be longer. Shutter speed is measured in second and fraction of a second.

2. An action can be frozen with the help of faster shutter speed.

3. Light painting is a photographic technique which is also called light drawing. Slow shutter speed is used in this technique due to which the exposure time becomes longer. We make a design in front of the camera with the help of a light source such as a mobile torch. The shutter speed is kept so slow that the shutter will remain open until the process of making that design ends.

4.b. If shutter speed is increased, exposure time decreases.

UNIT 8: PHOTO EDITING

Structure

8.0 Introduction

8.1 Learning Outcomes

8.2 What is Photo Editing?

8.3 History of Photo Editing

8.4 Digital Workflow

8.5 Basic Image Editing

- 8.5.1 Types of Graphics
- 8.5.2 Photo Editing Software
- 8.5.3 Editing Tools
- 8.5.4 Digital Image File Formats

8.6 Digital Art

8.7 Ethical Issues

8.8 Let Us Sum Up

8.9 Key Words

8.10 Further Readings

8.11 Check Your Progress: Possible Answers

8.0 INTRODUCTION

In this unit you will learn about the what and how of Photo Editing. You will be introduced to basic image editing techniques employed during the era of film photography and will be taken through its evolution over the years, till today, the era of digital photography. You will also read about various features of a photo editing software and their uses in photo editing. You will also be apprised of the process that is followed in order to edit digital photographs. Lastly, we shall discuss the impact and the socio-psychological repercussions arising due to photograph manipulation around the world in the social media along with other ethical issues.

8.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- discuss the evolution of photo editing;
- describe the use of various features of a photo editing software; and
- ascertain the use and impact of photo editing in digital era.

8.2 WHAT IS PHOTO EDITING?

You may recall seeing images in newspapers with text on them. These could be advertisements or simple posters or banners. It is understood that the text has been added to the photograph digitally. This is a basic example of photo editing. Simply put, when an image is changed, altered or even tweaked, it is defined as photo editing. One may attribute photo editing to the digital era, while the truth is that the film medium was also not untouched by ways of photo editing. From changing the composition of chemical washes to softening the photograph with use of filters, photo editing has been used to make the photograph more suitable for whatever purpose it was clicked.

8.3 HISTORY OF PHOTO EDITING

You may recall seeing old family portraits of your grandparents. They looked different from what your parents said about them. The eyebrows looked darker, skin more porcelain like, and moustaches more waxed. Ever wondered why? Earlier, before the advent of computers, people used to edit the photographs by hand. While some methods employed the exposure techniques like burning and dodging, some photographs were pasted by exposing two negatives together, or by double exposure. Paint, ink pens and air brushes were used on some to paint or darken the hair, brows and eyes and clear the skin. The airbrushing technique led to the software which is used today to be named so as well. Paint was used to highlight or darken few areas in the photograph. Few filters were used in front of the enlargers in order to expose the negative differently.

Traditional prints could be altered while exposing, or by scratching the negative manually. These were also called darkroom manipulations. Some also included bleaching portions of the photograph to colouring certain parts of the photograph by hand to resemble a painting. Earliest examples include a composited photograph of Abraham Lincoln, using his head from one portrait, and body of another famous person from another portrait.

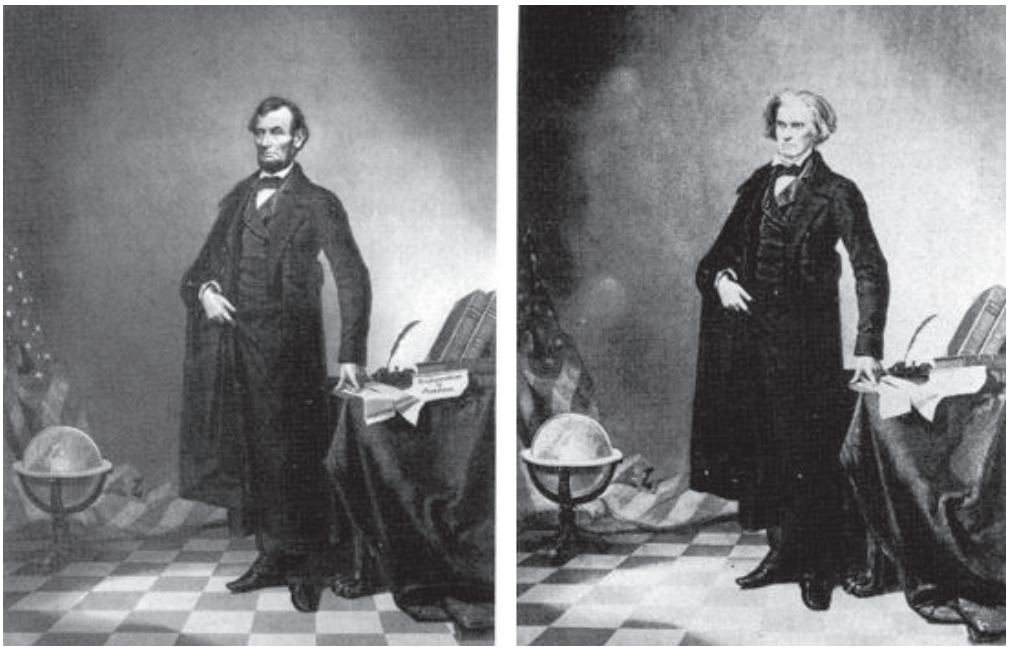


Image Source: Unknown author, Public domain, via Wikimedia Commonshttps://commons.wikimedia.org/wiki/File:Manipulated_portrait_of_Abraham_Lincoln_(1860%27s).jpg

Figure 1: Compositing Lincoln's face over a photograph

A lot of world leaders used photography as propaganda, for e.g. Russian leader Stalin frequently edited his political contemporaries in and out of the photographs to suit the party inclinations. John Heartfield manipulated photographs by using a technique called photomontage. His manipulated photos worked to critically analyse the Nazi propaganda with the help of media platforms.

Photo editing as we know today was made possible by Adobe Photoshop. Photoshop was launched in 1987. Since then, it has become so popular that the word 'photoshop' has started meaning photo editing in general. This software is used till date by the professional photo editors as well. The first open source image editing software General Image Manipulation Program or GIMP was launched in 1995, making image editing accessible to everyone. Today various software such as Darktable, Digikam and Photivo are available as open source. These software enable editing in various formats and also help in organizing and sharing the photographs over social media as well. In 2011, the photo editing app Fotolr Photo editor was released on the android app store, making photo editing possible even for the masses.

Today all smartphone cameras allow for Automatic Image Enhancement, which removes the need for basic editing. It clears and brightens the skin and darkens eyes and hair along with adding few more filters.

Check Your Progress : 1

Note: 1) Use the space below for your answers.

2) Compare your answers with those given at the end of this unit.

1. What were the tools used to edit photographs in the film era?

_____

_____

_____

_____

2. Write a short note on Photoshop.

_____

_____

_____

_____

8.4 DIGITAL WORKFLOW

Digital photography has made photo editing much simpler and accessible to all today. Every photographer today has to now follow a digital workflow in order to edit, display and archive the photographs. One may personalize this workflow according to his/her own need. Here we shall discuss the workflow step by step.

1. Capturing the photograph – you would have learnt about this step in the previous chapters. Scanning hard copies of old photographs also digitizes them and helps in taking them through further steps.

2. Transferring or Dumping the photographs – Digital technology allows for formatting and using the same chip again and again for photography. This makes losing the captured photographs very easy. Thus you must transfer the photographs after each shoot onto a hard disk, in a desktop or laptop. One may also create separate folders and name the photographs accordingly. The entire series may be named sequentially after that, like Cityscape1.jpg, Cityscape2.jpg, etc. This makes indexing and finding photographs later easier.

3. Editing the photographs – we shall discuss this in detail in next section.

4. Displaying photographs – Nowadays you can share photos through a pen drive, CDs and other memory cards. You may also share it through mail or upload through social media platforms such as Facebook and Instagram. You may also upload them on websites such as Flickr and create an online gallery for oneself. Today you can also change the privacy settings and control who can watch these photos and who cannot. Photos can also be used in other media formats, like using them in desktop publishing to be printed in some magazine, or incorporated in a film or a video, or make a montage to be played on any screen.

5. Archiving photographs – While social media archives these photographs automatically, one may create another backup in a hard disk for future storage. While photos shot on film used to yellow over time, digital photographs stay the same over years.

   Digital photography was initially shunned by film photographers but over the course of time, it has gained acceptance. Similarly, photo editing was also looked down upon by the eminent names of the field, but today not only retouching is justified, but digital art is also rising as a new field of expression and creativity.

8.5 BASIC IMAGE EDITING

Here, in this section, we shall discuss basic image editing including types of graphics, photo editing software, editing tools, their uses and various file formats of digital images.

8.5.1 Types of Graphics

Firstly let us discuss what are graphics. Graphics are images created or converted digitally. There are primarily two types of graphics: Vector and Raster Graphics.

Vector graphics : These are mathematical representations of the lines and curves present in an image. These types of graphics are used to create logos and other graphics that need to be independent of resolution. As a result, they do not pixelate when enlarged. These type of images can be enlarged to any proportion or size without getting pixelated or losing definition. Adobe Illustrator is used for creating graphics of this type.

Raster Graphics: these are pixel based images which have a predefined resolution. They are altered pixel-by-pixel in image editing software. They

need to be rendered finally before printing or exporting in any other formats. They can pixelate when enlarged. Photographs are raster graphics.

8.5.2 Photo Editing Software

A photo editing software is a tool which can be used to manipulate, edit and enhance images. With an interface to import photographs of various formats, the software has an array of tools one may use to achieve the desired result and to finally export the photograph in suitable format. Image editing software can be bought and downloaded from the web. Open source software are available free of cost, while software like Lightroom or Photoshop cost money like other software. While all software function to edit the image, their interface and window layout is different from each other. More complex the software, greater the number of tools and functions available in it.

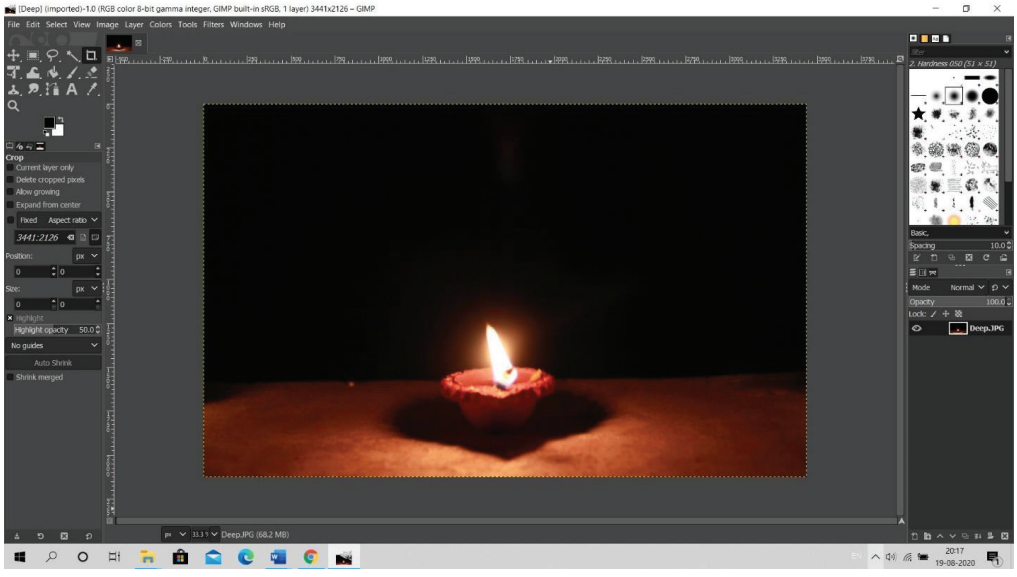


Figure 2: User interface of GIMP

These software can be classified on the basis of the skill, expertise and the controls provided. Most basic are the entry level software which are either free of cost or are available for limited time period. Professional software like the Adobe Photoshop and Lightroom offer a number of controls and are used professionally. Few apps that are popular are Snapseed, Afterlight, VSCO, etc. Today, even the word processing software have some photo-editing tools available when using the function to insert images.

8.5.3 Editing Tools

While there are a wide variety of software, there are a few tools that remain common to all of them, however simple or complex the software is. Here are few basic tools : Move Tool, Rectangle Select Tool, Ellipse Select Tool, Free Select Tool, Scissors Select Tool, Fuzzy Select Tool, Crop Tool, Bucket Fill Tool, Paintbrush Tool, Pencil Tool, Airbrush Tool, Ink Tool, Eraser Tool, Clone Tool, Healing Tool, Smudge Tool, Blur Tool, Text Tool, Colour Picker Tool, Flip Tool, Scale Tool, etc.

Figure 3: GIMP Toolbar

At the first glance, the toolbar seems complicated with a variety of tools, but on a closer look, many of these tools are inspired by the chemical lab tools photographers are usually familiar with. Before starting to edit, one should check the monitor or display settings of one's device as well, or else there will be discrepancies between what is seen on the screen and what is printed out or shared and viewed on other screen. Few controls that are most commonly altered are:

1. **Brightness:** Most basic image adjustment, this tool helps in increasing the overall brightness of the image. While the underexposed photos lose definition in the dark areas of the photograph and the overexposed photos do not register anything in the lighter areas, this control does not solve that problem, but enhances the average brightness of the photo. Burn/dodge tool helps in doing the same thing, but to select areas of the photograph.

2. **Contrast adjustment:** Contrast basically means the difference between the two extremes of the colour spectrum. An image with a lot of sharp white and black would be called a high contrast image and other with a lot of shades of gradient grey would be called a low contrast image. Image editing software can increase the intensity of all colours of the image making it strikes the eye more and creates a high contrast while low contrast image would have lesser difference in the values of the colours making them soothing for the eyes.

3. **Sharpness:** while this control is commonly confused with the focus control in the camera, it merely defines the edges of the elements in the photograph. Too much sharpness hurts the eye.

4. **Undo:** This is the tool one uses the most while learning the ropes or experimenting. The beauty of digital is that it allows you to reverse a number of steps and redo them again to check the effect, without spoiling the original photo.

5. **Resizing:** Increasing or decreasing size of an image to suit the requirement. Increasing the size after a limit pixelates the image, that

is makes it look rugged. Resizing, if not done appropriately, makes the subject look disproportionate. Resizing is done in order to make the image suitable for various purposes.

6. **Cropping:** Cropping means cutting out or reframing an image. By dragging the borders, cropping tool helps in eliminating elements that are not required and recomposing the image. These two tools are available even in the word processing documents, when dealing with images.

7. **Rotation:** Image rotation helps in rotating the image by angle. It can be used to make a horizontal frame vertical or correcting a photograph in which the lines like the horizon or buildings seem tilted.

8. **Noise Reduction:** When pixels can be seen distinctly in an image making it appear rugged, the picture is said to be noisy. Noise reduction makes the image smoother by reducing the noise.

9. **White Balancing:** In photography, you may have learnt about white balance and colour temperature. Getting the white balance right for an image is necessary in order to capture all the colours truthfully, as white light is made up of all the colours. At times it is not possible, or mistakenly forgotten during the time of shooting. Post processing of an image helps in getting the colours right in the image by adjusting the colour temperature of light.

10. **Colour Adjustment:** This function works by selecting a particular colour or hue in the image and adjusting its degree or even replacing it entirely.

Apart from these, few more tools are offered in software. Selection tools basically help in selecting a part of the image which needs to be worked upon. Rectangle selection helps in selecting an area within the rectangular frame, while free selection helps in choosing more fluid shapes. Move tool helps in shifting the selected area to the desired place while alignment tool makes sure that various selected elements are aligned with the required edge of the frame. Flip tool helps in changing the orientation of the photograph. Scale tool helps in increasing or decreasing the size of the selected portion while perspective tool helps in creating depth in the image. Colour selection tool helps in selecting the areas with common colour while bucket tool helps in filling colour in the selected area. Text tool helps in adding text onto an image. One can also change the size and the font style of the text as well.

Apart from these, some advanced techniques include:

1. **Modifying chosen areas:** one can choose a part of the image and modify only that. One could also copy one particular element from the frame and move it across, copy it and create a duplicate or just cut it out of the frame entirely.

2. **Eliminating the background:** The subject is selected and extracted from the image to be pasted on another background. Think about product photography on most commercial websites which has subjects on plain white background. Or better, think about your photo in your living room, cut out and pasted on the swiss alps! Visual Effects in films are nothing but a more elaborate form of photo editing.

3. **Portrait corrections:** It is also known as airbrushing. It is used to correct the complexion, body dimensions, hair etc of the models. Widely used in the fashion industry.
4. **Gaussian blur:** helps in creating a depth of field in the photograph. While one can tell whether this was achieved optically in the camera or digitally in the software, this is an easy replacement to focus attention on the select area in the photograph. It can also help in creating the blur that occurs in photography due to motion.
5. **Lighting:** This tool helps in adding some amount of light in post-production, in order to hide or highlight certain aspects of the subject. You can also correct the colour cast which may have happened due to some light source during the time of the shoot.
6. **Photo masking and layers:** It is the process of hiding and revealing the image layer by layer. It makes animation possible.
7. **Special Effects:** One may add anything to a photograph, ranging from text to fog to even an alien space ship!
8. **Photo Stitching:** When two images are combined together to appear like they were clicked like that.
9. **Correcting lens aberrations:** At times photography lens can lead to unwanted distortions in the image. For e.g. wide angle lenses make the image converge at the corners of the frame. Some software allow correcting these aberrations in post-production.
10. **Dust and Scratches filter:** This filter is used to correct the fading that may have happened over the course of time when old photographs are digitized to work upon.
11. **Clone stamp tool:** Clone stamp tool allows you to duplicate part of an image. This helps in covering patches or select areas in the photograph
12. **Text:** One can also add text onto the photograph to create a poster or a greeting card.

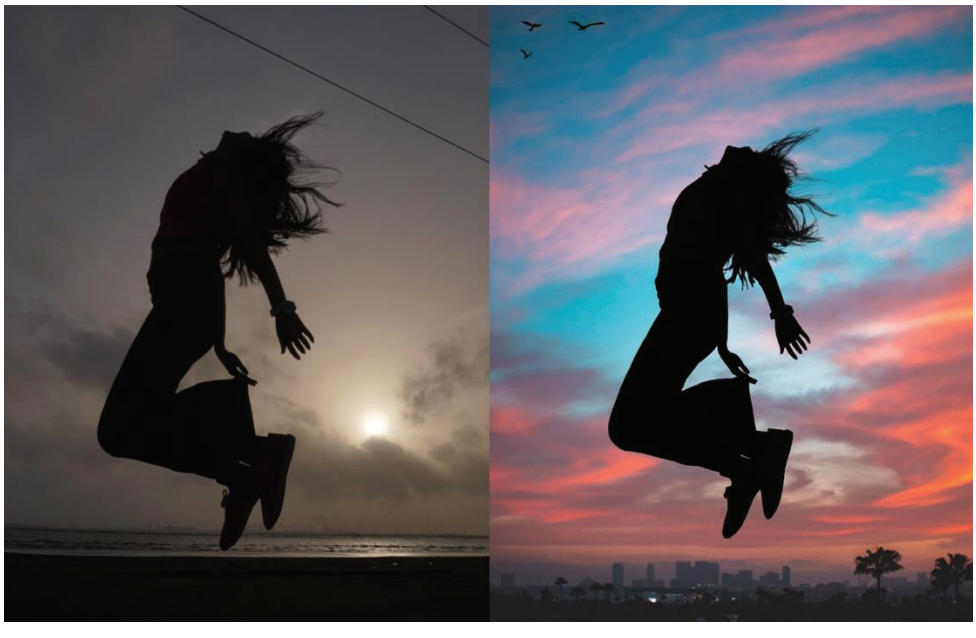


Image Source: Photo by Kaushal Moradiya, https://www.pexels.com/photo/adobe-photoshop-backlight-before-and-after-editing-2762759/

Figure 4: Changing background of a photograph

8.5.4 Digital Image File Formats

When you are done with editing the photograph to achieve the required result, you need to save it in the required formats. Choosing to save the file with the 'Save As' option leads you to various options of formats you can choose from to save the image. There are broadly two types of image file formats, lossy and lossless. Lossy formats compress the original image. It may seem like a perfect copy, but when you enlarge it, it becomes pixelated and loses details. Lossless formats save the file while compressing, but not losing the image detail. Here are few popular formats used in digital photo editing:

- .psd is the format of the files saved in Photoshop.
- .jpeg stands for Joint Photographic Experts Group. It is a lossy format and is one of the most widely used format across the world. Most of the cameras and phones save images in this format.
- .tiff stands for Tagged Image File Format. It is also a popular image file format.
- .png stands for Portable Network Graphics. It is an open source file format. It is apt for online viewing applications like Web Browsers
- EPS(Encapsulated PostScript) and PDF(Portable Document Format) are used when photographs are to be printed set in some sort of printing format.
- .raw file is exactly how it is named, raw, meaning it has not been worked upon at all. They need to be processed in order to be printed or shared through an editor. RAW files are large in size.
- .dng is short for Digital Negative Image File. It saves data in uncompressed format, thus very large in size.

Today smartphones are eliminating the need for following the entire digital workflow process and learning the tools of these software. With Automatic Image Enhancement, one can automate the process of touching up the photographs in post-production, albeit up to some extent. Automatic Image Enhancement is a feature available in latest smartphones and digital cameras which allow the images to be stored with automatic enhancement. This practically means that one can choose to adjust sharpness or colours or depth of field of an image automatically. You can also fix the red eye automatically. So when you click an image, the said features are adjusted automatically before storing the image. You cannot undo it later on. Most of the smartphones today allow the option of skin whitening and darkening of the brows or hair in the portrait mode.

Activity: 1

Download and install any open source photo editing software like GIMP or Photivo on your desktop or laptop. Import a photograph and try working on it exploring various tools and their uses.

Check Your Progress : 2

Note: 1) Use the space below for your answers.

2) Compare your answers with those given at the end of this unit.

1. Describe any two basic photo editing tools.

2. Name some advanced photo editing techniques.

8.6 DIGITAL ART

With the increasing popularity of photo editing software, there have emerged a number of art forms that make use of their features. Many graphic artists use these software for creating paintings/drawings, illustrations, cartoon strips etc. Digital art could be completely computer generated, that is starting from scratch just like a painting on Microsoft Paint or it could be using existing images to build upon.

Digital art initially met with a lot of resistance from the artist community as they believed that it destroyed the essence of art forms. Andy Warhol was one of the famous artists who combined digital art along with his traditional practices in 1980s. Today Photoshop is effectively used to create 2D and 3D graphics. It also enables the users to create photorealistic environments, to be used in video games, films and virtual reality.

Activity: 2

Download and install MyPaint on your desktop or laptop. It is an open source software used to create basic digital art. Try your hand at the software. Import and manipulate an image using its array of tools.

8.7 ETHICAL ISSUES

Photo manipulation has been used since long to create desired narrative in photographs as well. Our brains pick up visual cues present in a photograph and react accordingly. So, it becomes important to understand if the photograph has been manipulated at all, and to achieve what effect.

With the rise of magazines, tabloids and the paparazzi culture, photo manipulation became the need of the hour for the press. Photographs of famous celebrities morphed to appear slimmer, fairer and with people whom they had never met in real life started appearing in various print publications. This trend started off the debate about how much creative liberty is bad, and to what extent can the photograph be manipulated to distort the reality.

Advertising also requires photographs to be manipulated in order to sell a brand or product image. The whites are made whiter in the detergent ads and the skin is made brighter and blemish free in the ads for cosmetics. Photos one sees in

advertising campaigns are heavily touched up. The fashion industry is the worst under the lens as it thrives on images of beauty. It has been often accused of promoting an unrealistic body image specially in younger people. Manipulation of photographs of a celebrity's skin complexion, hair, body shape and other features is quite common. Many software are used to remove blemishes and wrinkles from the skin, make it appear brighter, erase stray hair and change the hair colour. Some software features can help add/remove costumes, hair extensions, make up and even piercings. In times like this, it is very difficult to tell if it is real, or fake and such images alter the perception of a normal human body for adolescents and teenagers. So, while the fashion industry states that it is catering to the beauty standards already existing in the society, it remains a matter of concern if they are the ones creating them or reinforcing them. Few magazines also came under the radar for being racist when photographs of black celebrities are brightened enough to be labelled as fair skinned.

With the advent of social media, the problem has increased manifold. Everyone has access to a smartphone which has a camera app to click photos with Automatic Image Enhancements with a click of a button. These photos can then be uploaded on to the social media with use of any other filters, to reach out to millions at one go. A lot of critical discussion and research is available on how these images affect the body image perception in youth and can lead to eating and mental disorders.

So while social media witnessed a rise in number of influencers, many celebrities have refused to get their photos edited at all, due to all these socio psychological issues arising. Few celebrities have uploaded their before and after make-up and editing photos on social media to spread awareness about the body image issues in young women.

8.8 LET US SUM UP

In this chapter, we first discussed the history of photo editing and the role it played in the heyday of film photography. Then after understanding the digital workflow we learnt about basics of image editing, including features of a software and what they are utilized for. After that, we also discussed how image editing software were used not only to modify already clicked photographs, but also in order to create art from scratch as well. Lastly, we went over few ethical questions that photo manipulation raises and how it may affect an individual.

8.9 KEY WORDS

- **Canvas:** the main workspace within Photoshop where photos, graphics, and drawings are edited.
- **Cloning:** copying an aspect of an image to another location in the image or in a different image.
- **Cropping:** cutting down the area of an image to repurpose it.
- **Filters:** effects added to images to manipulate the look.
- **GIF (graphics interchange format):** It is an image file format used primarily for saving images on the web originally developed by CompuServe.

- **JPEG (joint photographic experts group):** It is an image compression format which uses full range of 24-bit color, but still creates a small file. These images are commonly used in both desktop publishing and website design.
- **Layer:** It is an area in Photoshop where you can add text, colors, shapes and other elements.
- **Palettes:** areas within the workspace of Photoshop which serve functions such as the paths, swatches and layers palettes. Palettes are generally along the right of the screen.
- **PNG (portable network graphic):** an alternative image format to GIF. PNG files are used for web based graphics.
- **Photoshop Document (.psd):** file format that contains all of the layers, paths, text and effects added to an image enabling the user to go back into the project and do further editing in Photoshop.
- **Raster Graphics:** pixel driven pictures that have a set resolution. The pictures are rendered on the screen one pixel at a time to reproduce the image.
- **Vector Graphics:** mathematical representations of the lines and curves in an image. Vector graphics are resolution independent meaning that they can be scaled to any size without losing their sharpness.

8.10 FURTHER READINGS

Kelby, S., & Kloskowski, *M. (2013). The Photoshop Elements 12 Book for Digital Photographers. Peachpit Press.*

Perry, H. (2019). National Geographic Photo Basics: The Ultimate Beginner's Guide to Great Photography. National Geographic.

Photoshop, *A. (2017). Adobe Photoshop. Red, 2(189), 168.*

Team, *A. C. (2009). Adobe Photoshop CS3 classroom in a book. Bookman Editora*.

8.11 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress: 1

1. Earlier, before the advent of computers, people used to edit the photographs by hand. While some methods employed the exposure techniques like burning and dodging, some photographs were pasted by exposing two negatives together, or by double exposure. Paint, ink pens and air brushes were used on some to paint or darken the hair, brows and eyes and clear the skin. The airbrushing technique led to the software which is used today to be named so as well. Paint was used to highlight or darken few areas in the photograph. Few filters were used in front of the enlargers in order to expose the negative differently.

2. Photo editing as we know today was made possible by Adobe photoshop. Photoshop was launched in 1987, since then, it has become so popular that the word 'photoshop' has started meaning photo editing in general. This software is used till date by the professional photo editors as well.

Check Your Progress: 2

1. Two basic photo editing tools are:

a) **White Balancing:** In photography, you may have learnt about white balance and colour temperature. Getting the white balance right for an image is necessary in order to make capture all the colours truthfully, as white light is made up of all the colours. At times it is not possible, or mistakenly forgotten during the time of shooting. Post processing of an images helps in getting the colours right in the image by adjusting the colour temperature of light.

b) **Contrast adjustment:** Contrast basically means the difference between the two extremes of the colour spectrum. An image with a lot of sharp white and black would be called a high contrast image and other with a lot of shades of gradient grey would be called a low contrast image. Image editing software can increase the intensity of all colours of the image making it strike the eye more and create a high contrast while low contrast image would have lesser difference in the values of the colours making them soothing for the eyes.

2. Few advanced photo editing techniques are:

a) **Eliminating the background:** The subject is selected and extracted from the image to be pasted on another background. Think about product photography on most commercial websites which has subjects on plain white background. Or better, think about your photo in your living room, cut out and pasted on the swiss alps! Visual Effects in films are nothing but a more elaborate form of photo editing.

b) **Portrait corrections:** Also known as airbrushing. It is used to correct the complexion, body dimensions, hair etc of the models. Widely used in the fashion industry.

c) **Lighting:** This tool helps in adding some amount of light in post-production, in order to hide or highlight certain aspects of the subject.

d) **Photo masking and layers:** Process of hiding and revealing the image layer by layer.

e) **Special Effects:** One may add anything to a photograph, ranging from text to fog to even an alien space ship!

f) **Photo Stitching:** When two images are combined together to appear like they were clicked like that.

UNIT 9 TYPES OF PHOTOGRAPHY

Structure

9.0 Introduction

9.1 Learning Outcomes

9.2 Landscape Photography

- 9.2.1 Essential Equipment
- 9.2.2 Recommended Camera Settings
- 9.2.3 Shooting in Natural Light
- 9.2.4 Getting a Good Exposure
- 9.2.5 Composition Tips

9.3 People And Portrait Photography

- 9.3.1 Equipment
- 9.3.2 Lighting
- 9.3.3 Setting up Camera
- 9.3.4 Working with People

9.4 Street Photography

- 9.4.1 Tips to get started
- 9.4.2 Equipment
- 9.4.3 Camera Settings
- 9.4.4 Composition and Light
- 9.4.5 Legal and Ethical Aspects

9.5 Macro And Wildlife Photography

- 9.5.1 Macro Photography
- 9.5.2 Wildlife Photography

9.6 Night Photography

- 9.6.1 Exposure
- 9.6.2 Focusing

9.7 Let Us Sum Up

9.8 References and Further Readings

9.9 Check Your Progress: Possible Answers

9.0 INTRODUCTION

Photography is the process of capturing light on a light-sensitive recording medium. There are two very important aspects to photography:

Technical: It is the science of taking pictures with your camera

Aesthetic: The art of composing to capture stunning images

There are different types of photography. Some of them require specialized techniques. In this unit, we shall discuss the of the different types of photography.

9.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- understand the various aspects of different types of photography;
- describe the requirement of suitable equipment and lighting for different types of photography; and
- improve your photography skills for different types of photography.

9.2 LANDSCAPE PHOTOGRAPHY

Landscape photography is one of the most common and most widely done photography. There is always more to learn and explore. It is imperative to know how to use light and composition, you will quickly come to understand that making a striking landscape photograph involves a number of essential ingredients.

9.2.1 Essential Equipment

Your Camera : If you are getting serious about taking photographs, you'll want a camera which has a bigger sensor which accepts variety of lenses. DSLRs are the most popular type of camera for landscape photography. They allow you to shoot in RAW format to record maximum data They have a variety of shooting modes including fully manual. Mirrorless cameras are relatively new technology. They also have all the same features as a DSLR.

Lenses: It might seem weird or absurd to spend more on lenses than on a camera, most photographers agree that they would always prefer to have a less expensive camera with a quality lens. Lenses come in two different types; prime and zoom. A prime lens has one fixed focal length. A zoom lens has variable focal length. Prime lenses are sharper than zoom lenses. However, zoom lenses are much more versatile and allow you to carry fewer lenses in your bag. To start with you can use the following lenses:

- Anything ranging from 10mm-35mm
- Regular Zoom 18-55mm
- Telephoto 55-210mm

Tripod: It's very important to have a tripod for landscape photography. When you have lots of light, it is easy to hold the camera by hand. In low light situations such as sunrise or twilight, you'll need a tripod to experiment and learn with low shutter speeds.

Filters: There are some filters used for landscape photography - Polarizing Filter, Neutral Density (ND) filter, and Graduated ND filters can be used if there is a straight horizon. Make sure to get the right filter size for the lenses you are using.

9.2.2 Recommended camera settings

Shooting in RAW: The most commonly used format is JPG files since this is the default setting on most cameras. JPG is a compressed format and it compresses data while shooting. Raw format, is uncompressed with no information loss.

Shooting Mode: Most cameras have a mode dial on the top where you can choose your shooting from the following settings; auto; aperture priority; shutter priority; program; or manual. For landscape photography, it is recommended to shoot in aperture priority mode, marked on your camera's mode dial as "A" or "Av". It controls the depth of field in your image - the relative focus in the image that will be in focus. For landscapes, you want everything from the foreground to the background sharp, so it is advisable to use aperture like f/11 or f/18.

Metering Mode: Evaluative or Average metering is the most common metering mode for landscape photography. This is your best bet most of the time when the highlights and shadows are spread relatively evenly throughout the scene.

Focus Mode: For landscape photography, single shot autofocus is the best option. The other focus modes are good when you have something moving in the frame.

9.2.3 Shooting in Natural Light

Understanding how natural light works is a critical aspect of landscape photography. If the light isn't right for the scene you are shooting, your photographs will not be exposed properly.

Sidelight: This happens when light hits your subject on one side casting a shadow on the other. This type of lighting is the most ideal for landscape photography as it creates good contrast emphasizes texture and shape.

Backlight: When light is in front of the photographer and is hitting your subject from behind it is called backlight. It gives you high contrast and is difficult for getting correct exposures. This kind of light is used to create silhouettes.

Front light: Front light happens when the sun is behind the photographer and is hitting directly on the subject. This is my least favored type of light because it is often intense and unforgiving causing a scene with a lack of texture and depth.

9.2.4 Getting a Good Exposure

Getting a good exposure means using a balanced aperture, shutter speed, and ISO so that you don't have any areas of the frame that are too bright (known as blown out highlights). The problem is that if you have blown out highlights, there is nothing you can do in post processing to fix it. It will forever be a white spot. You may also want to make sure that you don't have any areas that are too dark, unless you are creating a silhouette.

Aperture is the variable opening of the lens through which light travels and reaches the sensor and its denoted by f-stop. The smaller the f-stop number,

the larger the opening. If it is confusing just remember it's like a fraction and 1/4 is bigger than 1/16 so f/5.6 is bigger than f/32. The larger the opening the shallower the depth of field.

After setting the aperture, the other two factors in exposure are ISO and shutter speed. ISO is the sensitivity of your sensor to light. A low ISO is used when there is lot of light and high ISO is used in low light conditions or while shooting fast moving subjects.

However, increasing the ISO causes noise and it is recommended to use lower ISO. After setting your aperture high and the ISO low, keep the camera is Aperture priority mode and the camera will automatically determine the Shutter speed for the available light.

9.2.5 Composition Tips

When you are a beginner in landscape photography, it can be difficult to know what to include in the frame to make a compelling composition. There are few rules photographers can use to get striking images.

Rule of Thirds: The rule of thirds is the most commonly used "rule" in photography and it is like a guideline for photographers. The frame is divided into three equal parts horizontally and vertically and the intersection points become the principal focal points. A pleasing effect can be created by placing the main subject in these focal points.

Symmetry: In symmetrical composition the subject exactly in the middle of the frame with equal weight on either side. The two sides of the image are often a mirror image of each other.

Leading Lines: Another effective way of composing an image is use leading lines to draw the viewer's eye to the main subject. The lines can be man-made such as roads, fences, or bridges, or they can be natural.

Landscape photography examples:

Photograph by Nithil Dennis

Photograph by Nithil Dennis

Check Your Progress: 1

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. Which one is correct as per rule of thirds in relation to the horizon
   a. the horizon line should be in the middle of the frame
   b. the horizon line should be in the upper 1/3 of the frame
   c. the horizon line should be in the lower third of the frame
   d. b & c
2. The best time of day to take landscape pictures……..
   a. Mid-day
   b. Night
   c. Foggy days
   d. early morning and late afternoon
3. A tripod helps keep your landscape image in focus
   a. True
   b. False

9.3 PEOPLE & PORTRAIT PHOTOGRAPHY

Whether you are shooting a family or an individual, to master the art of portrait photography there are a few things you need to learn.

9.3.1 Equipment

Fixed Focal length lenses:

50mm lens: Many photographers purchase a variety of 50mm lens along with their kit lens. The price of a 50mm lens is reasonable, and for a lot of photographers, having the ability to shoot at f/1.8 is an art in itself.

If you're shooting with a full-frame camera, the 50mm lens is great for photographing families and groups. If you're shooting with a 50mm lens on a cropped sensor camera, it's a focal length that's great for portraits and photographing couples.

85mm lens: Most commonly used lens is 85mm, it allows you to fill the entire frame with the subject's face or backup to include their entire body. The ideal focal length for portraitures is considered to be from 85-105mm.

Zoom Lenses

Art Lens: The 18-35mm f/1.8 is designed for cropped sensor cameras, this lens has a range that includes many of the most popular focal length for portraitures.

The 70-200mm: This lens is considered to be the best lens for wedding and event photography because of its versatility in capturing people across a variety of focal lengths.

9.3.2 Lighting

Photography is the art of "painting with light". Light is the most important component and it is important to have a good understanding of the different light. There are two different light sources a photographer will encounter.

Natural Light : The basic and the most common type of lighting is natural light - all of the light in your photograph is coming from the sun. The main source of light is singular and comes from the sun. If you're shooting outside you will obviously be making use of natural light, or it could even mean you're shooting indoors near a large window.

Artificial Lighting : The other type of lighting you will encounter is studio lighting (Artificial Lighting). Studio lighting means that you're using a flash, stand light, or other artificial light sources as your primary source of light. Using studio lighting does involve a different set of skills in photography. Learning studio lighting is a great way to achieve a good understanding of different lighting situations.

9.3.3 Setting up Camera

There are two ways to shoot people and portraiture. We can use either Aperture priority or Shutter priority.

Aperture Priority : When you use Aperture Priority mode on your camera, you select the camera's aperture, and the camera will select the rest of your settings. You can still select your ISO if you wish. When you select a small aperture number (f/1.8), less of your image will be in focus. When you select a large aperture number (f/8), more of your image will be in focus. To create a portrait with a bokeh, shooting with a very wide aperture (f/1.8) is one way to achieve that effect.

Shutter Priority: Aperture Priority mode is used for photographing people who are stationary, Shutter Priority mode is used for photographing people who are moving. In street photography if you want to show the blur of the fast moving people, Shutter Priority is a great way to either stop action or emphasize movement in people photography.

9.3.4 Working with People

There is a whole lot of difference between taking a snapshot of a person and creating a portrait that captures the essence and emotions. So as a photographer it is important to speak and communicate clearly to the people being photographed.

Posing : As a photographer first you should make your subjects very comfortable. After you reach the comfort level required you should have pre visualization to make them pose the way you want to. Explaining the concepts and emotions you want to capture will give them an idea. It is also important to choose the right backgrounds and the poses are related to the background. The key in posing with props is to use the prop in the right way. You can also shoot a few trial shots of the model or person you are shooting and then advise them on the specific look, pose you need.

Prompting : Prompting to get the right emotion is also a very important part of portrait photography. Children can give a variety of emotions when prompted correctly. A casual talk about favorite movies, or their favorite actress and singers, may be even ask them to explain a funny situation can make the air light to capture the right emotions.

Some Portrait Photography Examples:

Photograph by Nithil Dennis

Photograph by Nithil Dennis

Check Your Progress: 2

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What kind of light creates a silhouette of a person ?

   a. Side

   b. Front

   c. Angled

   d. Back

2. The type of lighting which has flat shadows or no shadows at all

   a. Back

   b. Frontal

   c. Fluorescent

   d. Side lighting

3. A portrait that gives importance to the subject and defocusses the background is…….

   a. Candid

   b. Self Portrait

   c. Formal portrait

   d. Candid portrait

4. A portrait that emphasizes the subject's surroundings in an effort to convey information about the subject is called ……..

   a. Candid

b. Self portrait

c. Environmental

d. Formal

5. Any illumination that does not come from the sun or moon is called ….....

a. Artificial lighting

b. Fluorescent

c. Natural lighting

d. Flood light

9.4 STREET PHOTOGRAPHY

Street photography is candid photography people and action on the streets. It shows our surroundings, and how we as photographers relate to them. Photographers filter what they see, to find the moments that are interesting.

9.4.1 Tips to get started

The best tip is to find a good spot on a busy street and wait for the action to take place. If you are walking, you will come across many interesting things, but will only give yourself a brief moment to capture. Find the right location, and then just wait for the right moment to happen. The most important aspect in street photography is to observe keenly. People will be entering your personal space and you will be able to get the best candid shot.

Photographing the space near you gives you a lot of freedom as you are familiar with the environment. It is a common misconception that you can only do street photography well in the most interesting cities or famous streets. The best photographer can take good photos in any given location.

9.4.2 Equipment

Street photography can be done with any type of camera. However, different equipment will have different advantages. A zoom lens will give you more flexibility in being candid and not being observed A prime lens will restrict the distance from the camera, but will also be easy to use. Traveling with a light mirrorless, micro four thirds cameras, or even a camera phone, will allow you to take images more easily. They are lighter and fun to shoot. Prime lenses, will allow you to observe the world more intuitively with that focal length.

9.4.3 Camera Settings

Photographer follow different methods to shoot in street. There is no correct way, but a few factors may be considered. Use of bokeh in the images is a very common way for photographers to create nice dramatic images. By choosing to blur the surroundings; you will also remove some of the context and background from the image, which in turn can be detrimental in telling the story. A better suggestion would be to shoot with as much depth of field as possible.

9.4.4 Composition and Light

Composition for street photography is mostly the same as most of other genres in photography, but there are a few things that we can consider.

- Compose your street photographs using the general rules of composition (Rule of thirds, Symmetry, pattern, contrast, color). Observe the scene and arrange all of the elements together. Every element in the frame counts and no matter what it is, and the best way is to have a rhythm in your photography and composition.
- In certain situations, you will prefer to use shallow depth of field and get the distracting elements in the frame out of focus. Photographers should try to look beyond the main focus, and see if you can combine it with other elements to create a more complex scene.
- It is very important to see how light hits your subject, and where is it located in relationship to that subject? How is it hitting the background? What color is the light, and are there multiple light sources?

9.4.5 Legal and Ethical Aspects

Different countries have different laws for street photography. In many places you get a lot of freedom, but in some countries it may also be illegal. So, while starting street photography at any place we must learn about the related rules and regulations applicable to that particular place. There are also different rules for public and private properties.

It is always smart to research the area you're traveling to, so you can find out what street photography practice is like there. In some places, it is much easier to do this type of photography, while in others people may be much more confrontational.

Ethics in street photography : Ethics is an important aspect of street photography. Sometimes the subject you have captured may not like to be captured and some might love to be captured. Most street photographers face a moral dilemma, as most of the time the photographer's intentions are to capture culture and lifestyles. The most interesting images are the ones usually with art, culture and people. These are the photographs that so many find fascinating, because there is a lot of cultural value to them.

If you have taken someone's picture and that person spotted you, it is important that you show the picture you have taken of them and speak to them and explain them the purpose of your photograph. You can always say that you are photographer who is doing a project capturing the culture and people. If they ask further, to make them comfortable you can agree to delete the images you have taken and at the same time use a bit of flattery so that they volunteer to give permission.

Check Your Progress: 3

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. Which cameras is most suited for street photography?

   a. Large format

   b. Medium format

   c. Mirrorless

2. Which of the statements describes street photography?
   a. Moments of everyday street life caught on camera
   b. Carefully constructed portrait work
   c. Documenting rural landscapes
3. Choice of aperture is very important in street photography because……
   a. To control depth of field
   b. Not to risk exposure
   c. Shooting large format requires aperture controls only
4. Which of the following are not likely to be found in a street photographer's camera bag?
   a. Lens cloth
   b. Spare battery
   c. Cable release
5. Which is the most important skill for a street photographer ?
   a. Planning lighting and composition
   b. Good writing skills
   c. A sound knowledge of camera and settings to shoot quickly

9.5 MACRO AND WILDLIFE PHOTOGRAPHY

9.5.1 Macro Photography

Macro photography is close-up photography of small subjects, including things like bugs and flowers. Technically macro photography is about taking pictures of subjects that are smaller than your camera.

Equipment : Close-up and macro photography is a specialized form of photography, and it requires special lenses, flashes and tripods. There are few ways photographers can avoid using these complicated and expensive equipment.

Lenses : Macro lenses specially designed to do close focusing. If the budget permits and you want to specialize in macro photography then invest in a high-end macro lens, but for those of us with more limited funds here are two alternatives:

i. **Extension Tubes:** They are exactly what they sound like, it is a tube that go between your camera and the lens. Extension tubes technically increase the distance between the lens and your sensor When you use these extension tubes in combination with a good quality lens, some amazing images are possible.

ii. **Lens Reversal:** This is an old technique similar to inverting a binocular. Take an old, manual lens standard or wide-angle and then buy a cheap adapter that allows you to attach the front of the lens to your camera, and you get an instant macro lens at your disposal.

Lights: Natural light is the best lighting for macro lenses. A place which has a bright, diffused light, is very ideal. Once you have mastered photographing macro with natural light you can advance to studio lights

To learn photographing macro with artificial lights it's important to start off by attaching your flash near, or directly onto your lens, so the light falls just a few inches in front of the glass. Shadows are emphasized up close, so you want to minimize the distance between the flash and your lens.

9.5.2 Wildlife Photography

Wildlife photography is one of the most exciting genres and many amateurs aspire to be wildlife photographers. To be practical it is very difficult to become a wildlife photographer overnight. It requires a lot of technical expertise and photographic gear. It is a genre which requires a lot of patience. It is important to be sensitive, ethical and careful while shooting wildlife. The following are a few tips for a beginner in wildlife photography

Equipment: Most wildlife images constitute animal portraits, but a beginner can start with wide shots which includes the environment or the habitat of the animal. The most frequently used lenses for wildlife photography are 500mm . This lens can be combined with a 1.5 tele converter. Many photographers also use the following lenses - 100-400mm zoom, and the 70-200mm f/2.8. Amateur wildlife photographers can rent the lenses and use them before they buy them. Renting is a great and reasonably priced option to try out a variety of lenses.

The ideal wildlife kit will look something like this

- DSLR
- 500mm
- 100-400mm lens
- 70-200mm lens
- 1.4x tele converter
- A sturdy tripod

Techniques : There is a saying in photography: "If your image isn't good enough, you aren't close enough." But in the case of wildlife photography this is tricky. Getting close requires patience. If you approach an animal on foot, the subject will be threatened and move away. So easy way to get close to wildlife is to be in a place where animals are accustomed to people. In most wildlife parks and national parks, the animals are used to seeing people or vehicles and will allow you to get much closer. Wildlife trails can be best places for bird photography.

Use a blind: Many wildlife watch towers are equipped with photography blinds which hide you from view of the wildlife. These places are good locations to spot wildlife. You can build your own DIY blind to shoot the birds in your backyard.

Camouflage: You can cut a camo sheet to accommodate the lens and sit on the ground. This portable blind serves well, but you need a lot patience to stay in one place for a long time.

Patience: Patience is the key in wildlife photography. Most of the above techniques also require patience, the photographer has to wait, for long hours to capture the right moment. The photographer should find a right place (Ex: near waterholes and nesting areas) and wait to get amazing shots. The best wildlife photographs were done this way.

Exposure: It is very important to strive for the proper exposure while you are shooting. Capturing the action, the expression, posture, and the setting are the most important parts of wildlife photography. Make sure you do the right exposure by letting the camera in a setting suitable for the situation and wait for the action to happen. At times you might end up with underexposed or overexposed images which later can be corrected in post processing. The ideal setting for wildlife photography will look like this : Shoot in shutter priority mode, keep the ISO 800, and put the camera on automatic for the remaining settings. This can be used as a standard starting point.

Shutter Speed: A photographer will encounter moving subjects most of the time in wildlife. It is very important to decide the action (Blur or Freeze) before you pre-determine the shot.. You can always shoot the moving action in freeze or blur and shift to either mode in seconds in shutter priority mode.

Composition: Getting low is a nice trick used by wildlife photographers. Try and analyze the pictures shot by expert wildlife photographers and understand their view points. Most of the time the pictures would be shot from a low angle. This low angle gives you wonderful perspective of the animal's life and habitat mostly true with birds and smaller animals and insects.

Portraits: The secret of a good wildlife portrait is getting closer to the subject, and having a setting where the animal can be cleanly separated from its background. Preferably use a large aperture (f4) which will blur the background and the same time retain a certain focus on the subject.

Action: In wildlife photography it is also important to record behavior, action, and motion in images. These photographs tell a bigger story, and they are more compelling. Animals spend a lot of time lazing around, especially after food. Birds perch for extended periods, bears sleep or graze, and big cats climb trees and lounge. Most of the time the action won't be a part of wildlife. So it is very important to wait and also research a lot on their behavior to catch them in action.

Wide Angles: When you have a subject which is patient as well and is cooperative then you can try a few more techniques in wildlife. Using a wide angle lens, we can capture the habitat and create stunning pictures of animals in their own habitat.

Check Your Progress: 4

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What photographing position is less likely to surprise your wildlife subject?

   a. Low to ground

   b. Standing on the ground

c. High in the tress

2. The best location to do bird photography is…….

   a. Deserted Island

   b. Popular beach

   c. Tropical forest

3. What is the best lens for habitat photography?

   a. Telephoto lens

   b. Super telephoto

   c. Wide angle

4. What camera setting is to be on priority if you are shooting fast moving animals ?

   a. Shutter speed

   b. Aperture

   c. ISO

5. Which lens has narrow angle of view ?

   a. 10mm

   b. 100mm

   c. 300mm

9.6 NIGHT PHOTOGRAPHY

If you take a picture of a building or a normal street scene during the day, it can be sort of uninteresting. The same shot taken in night can be dramatically different and interesting. Night photography can look tricky, but with a little bit of guidance you will be able to capture sharp images. Photographing in the dark certainly has a lot of challenges, in some ways, it is actually easier than photography during the day. So let's take a quick look at the essentials of night photography.

9.6.1 Exposure

The darkness changes everything. The most important thing in night photography is a tripod and a sturdy one. Refreshing a little bit of our own memory we understand that exposure is a result of three controls (the exposure triangle) – shutter speed, aperture, and ISO. So in darkness, the camera needs more light to record the scene, and it is done with affecting any of these controls. For night photography, you will have to use shutter speeds that are longer than one second sometimes significantly longer. Keeping the shutter open for a longer period of time, the camera will require a tripod. You can leave the shutter open as long as you want, as long as the camera is steady and does not move at all.

Aperture: We all know that the size of the aperture determines the amount of light being let into the camera for a given shutter speed, and it also affects the depth of field. For night photography, if you set your camera to lower apertures, it will require ridiculously long exposures. In addition, the background is usually

black, so you don't need to worry too much about getting a wide depth of field. We should use an open aperture to capture more light.

ISO: The third exposure control, ISO, is a measurement of the sensitivity to light of your digital sensor. Higher ISO results in digital noise which can distort your images. This is a common problem faced while shooting night photographs. It is always better to use optimal ISO and not pump it up too high. However, in those cases where you cannot use a tripod or you have a moving subject, you will need to increase the ISO

Exposing Night Sky: There are a lot of techniques that can be used to create striking photographs of the night sky. To photograph the stars in the sky use the widest f/stop as your lens allows, and shutter speed of about 20 seconds. Any more time than that and the stars will begin to blur. Increase the ISO as needed for a good exposure. Use a wide-angle lens, and also incorporate the foreground into your images. The image in the foreground may complement the night sky. The foreground can also be lit using a variety of techniques.

Some tips for Night Sky Photography:

- Look for cool clear moonless nights
- Always have your batteries fully charged
- Use a sturdy tripod and cable release; set up your composition, lock down the focus, and make a test shot.
- Shoot in RAW format
- Set the white balance between 2800°K-4000ºK.
- Make a series of exposures
- A good starting exposure for most star shots is to use the widest aperture on your lens, expose for 20 seconds, increasing the ISO as needed for a good exposure.
- Turn ON the camera's Long Exposure Noise Reduction feature.

9.6.2 Focusing

Another tricky situation in night photography is the focusing. Most of the cameras focus by detecting contrast. So the most likely situation at night is that the scene will be too dark for the camera to detect contrast. A few following tips in focusing can help the photographer to achieve sharpness:

- Focus on a bright light in the picture (Street Light)
- You should try focusing the edge of the light which will give you the necessary contrast.
- If you are using an off camera flash or if you are holding a flashlight, you can hold the light to the subject and then focus.
- The best way is to use manual focus and rely on your own eye sight.

Few examples of Night Photography:

Photograph by Nithil Dennis

Photograph by Nithil Dennis

Check Your Progress: 5

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is the best ISO setting for low light conditions?
   a. ISO 100
   b. ISO 32000
   c. ISO 800
2. Aperture is very important priority for night photography.
   a. True
   b. False
3. To obtain traffic trials which of the following shutter speeds is better ?
   a. 1/2000th Sec
   b. 1/400th sec
   c. 1/5th Sec

9.7 LET US SUM UP

Photography is fun and can be extremely rewarding to learn as a skill, but it is a skill that can take a long time to develop. After a period of time you will ask a lot of questions about your own composition or the exposure. It will become a habit for you to analyze the light, the shadow, the highlight and the overall feel of the picture you have taken. It is very important to continue shooting and improving the skills. We all learn at different speeds, so all you need is to focus on improving your own images.

9.8 REFERENCES AND FURTHER READINGS

Harnischmacher, C. (2016). The complete guide to macro and close-up photography. Santa Barbara, CA: Rocky Nook.

Keimig, L. (2017). Night photography and light painting - finding your way in the dark. Taylor & Francis.

McKinnell, A., Gibson, A. S., Flint, J., Lamas, J., Sime, Gilfillan, D., . . . Book. (n.d.). Digital Photography School. Retrieved from https://digital-photography-school.com/

Michals, D. (2017). Portraits. New York: Thames & Hudson.

Randall, G. (2020). The art, science, and craft of great landscape photography. San Rafael, CA: Rocky Nook.

Tipling, D. (2007). Digital wildlife photography. Buffalo, NY: Firefly Books.

9.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress: 1

1. (d) 2. (d) 3. (a)

Check Your Progress: 2

1 (d) 2 (b) 3 (c) 4 (c) 5 (a)

Check Your Progress: 3

1 (c) 2 (a) 3 (a) 4 (c) 5 (c)

Check Your Progress: 4

1 (a) 2 (c) 3 (c) 4 (a) 5 (c)

Check Your Progress: 5

1. (c) 2 (b) 3 (c)

UNIT 10 PHOTOJOURNALISM

Structure

10.0 Introduction

10.1 Learning Outcomes

10.2 Photojournalism

- 10.2.1 History of Photojournalism
- 10.2.2 Why Study Photojournalism
- 10.2.3 The Camera as a Tool

10.3 A Picture is Worth a Thousand Words

- 10.3.1 Visual Research
- 10.3.2 Composition and aesthetic value
- 10.3.3 Visual Grammar: Shots and Angles

10.4 News Photography

- 10.4.1 News Value and Photography
- 10.4.2 Spot News, Portrait, Sports
- 10.4.3 Features and Photo Story

10.5 Post Production and Editing

10.6 Photojournalism and Ethics

10.7 Let Us Sum Up

10.8 Keywords

10.9 Further Readings

10.10 Check Your Progress: Possible Answers

10.0 INTRODUCTION

Photojournalism is the process of telling stories using photos as the medium. It uses a camera to capture visual representations of a story. Photojournalism follows a set framework of rules and principles for composition. The stories told using photos are supposedly true and thus should be communicated in a fair and unbiased way. In photojournalism, the news photos often evoke intense emotions among viewers, like shots of disaster survivors or scenes of a terrorist attack. In print media the content is largely text and only certain stories are supported by photos. In photojournalism, photographs are used to tell incidents, events and other important news. It uses the body language and facial expressions of the subjects i.e. the people involved in the incident to tell their story. As the term suggests, photojournalism is the fusion of photography and journalism. It is used extensively in newspapers, news magazines, film magazines and advertising magazines.

Every newspaper and magazine takes the services of photojournalists to cater to its audience. News photography is used in print and electronic media to convey the stories and to reach out to maximum audience.

10.1 LEARNING OUTCOMES

After reading the Unit, you will be able to:

- understand the concept of Photojournalism;
- understand the visual grammar used in photojournalism;
- know the different types of news photography; and
- understand composition and its use in photojournalism.

10.2 PHOTOJOURNALISM

Photojournalism is an effective way of telling stories and disseminating information to a diverse group of people. Photojournalism gives visual support to the news story. A good news photo tells a story all on its own and requires little to no writing to back it up. Social media tools like Instagram, Facebook, Snap chat, WhatsApp etc have made it really convenient for people to share photos and videos. These tools are even being used by the news organizations to disseminate news. YouTube provides space to people and organizations so that they can start their own channels where viewers can come and see the videos on a variety of subjects. Photographs paint real pictures of news, events and varied human emotions.

In big newspapers and magazines, photographers work with a journalist assigned to a particular news beat. This means that the photographer takes photos related to the new storyand the reporter collects the facts for the story and writes it. The main objective of photojournalism is to tell a story better than the text or writeup that usually accompanies the photos. Therefore, it should capture images that have a specific meaning or relevance to the story being told. For example, a story about a father reunited with his daughter after being apart for 30 years will be more effective if it is accompanied by a photo showing them rushing into each other's arms.

Photojournalism covers latest national and international news developments which are of public interest. A good photojournalist will focus on latest news which is being discussed by the common man for example the current cricket tournament series or the announcement of elections etc. which will be of more interest to the reader.

A good photojournalist should be objective and honest. He should present the images as they are with no manipulation. In fact a photojournalist knows that real emotions of people are captured when they are relaxed and busy with their daily chores. These candid and perfect moments are captured by the lens and become timeless classics. A good photograph should try to answer maximum number of Ws and H. For example, a photo that shows a family off our begging for food and money tells a clearer story than a single person begging for food.

Photojournalists follow certain principles to produce photos that catch the attention of different audiences. Photos taken with the right focus, exposure, angle and colour are understood better by larger audience as compared to photos in which the subject is not in focus and which lack proper camera angle. Photojournalism can be done for –

a) General News Stories, which pertains to any event that is planned ahead of time. Examples are press conferences, product launch ceremonies, exhibitions and political rallies.

b) Spot or Breaking News, refers to any event or incident that has just happened. It is a breaking news story where the photojournalist rushes to the place of the incident and takes shots which convey the essence of the story. A house or building on fire, car accident, plane crash or a bridge collapse are some of the examples.

c) Sports Photography is seen as the most difficult type of photojournalism. The camera lens has to follow the movement of the player, ball or the vehicle as the case may be. Special attention has to be given to the aperture and shutter speed settings. Generally experienced photojournalists are given sports assignments like basketball game, a football championship match or an IPL match.

e) Portrait Photojournalism: a portrait shows people from the society in their usual environment, like a race car driver beside his car, a doctor inside the operating theatre or the defence minister in her office. The portrait captures the emotional state of the person. Portrait is often given in an exclusive interview or any special report where that person happens to be a central figure or an important functionary.

Good photos convey the key points of a story faster than its accompanying text. The photos should focus on the faces of the people and not on their backs. A good photo will show the person doing some action or group of people involved in some activity. Any unusual photograph showing a new phenomenon, emotion or extraordinary act may qualify as a good photograph. The subject has to be in focus and the audience should be able to find the key area to focus on in the frame. For example after a heavy snowfall the focus of one picture can be on the sufferings of the people living in that area and other picture can be on the extent of snowfall i.e. the amount of snowfall.

The photographer through right composition and proper visualization has to convey the right message, one that should be able to tell the audience where to look in the photo. Any two pictures will have two different angles for a story. This sort of work needs careful planning and execution. Always take note of the angle of the shots and position of the camera before taking the pictures. Experienced photographers often take multiple shots from different perspectives. This process is quite easy with digital cameras. Digital Single-lens Reflex Camera (DSLR) manufactured by Nikon, Cannon, Sony, Fuji etc. support memory cards as high as 128 GB or so. They can also at the same time see the output and take many shots without worrying about the storage space.

10.2.1 History of Photojournalism

The history of photojournalism can be traced back to the experiments done by Joseph Nicephore. In 1826 Joseph Nicephore slotted a pewter (a alloy of tin, copper with antimony) plate into his camera obscura and exposed that plate to the surroundings. He washed this exposed plate with lavender oil after eight hours and found that an image had formed on the plate. This image was not very clear but the scene was more or less visible. Joseph Nicephore claimed it to

be the first photograph, built without a negative. Carol Szathmari a Romanian painter and photographer was among the first who did photojournalism with the help of his engraving and painting technique. This engraving technique was also used in the American Civil war.

The first 35mm Leica camera came in 1925 and this marked the beginning of the Golden Age of Photojournalism. First commercial flash bulbs came in 1927. The early 35 mm camera was small and light. They were more portable and the printing methods used in these cameras were less cumbersome. Prominent photographers in the golden age which spanned from 1930s to 1960s included Walker Evan, Dorothea and Gordon Parks.

Homai Vyarawalla is recognized as the first woman photojournalist of India. She was born in Gujarat and it was her husband Manekshaw Vyarawalla who introduced her to the world of photography.

Tamabarahalli Subramanya Satyanarayana Iyer, popularly known as T S Satyan is known as the father of Indian Photojournalism. He was born in Mysore in 1923. In 2005 T S Satyan published his memoir "Alive and Kicking" in which has mentioned his experiences and various assignments he did in his life as a photojournalist. T S Satyan passed away in 2009.

It seems the market for visual storytelling is going to stay and rather going to expand further. The media and industry report by Indian Brand Equity Foundation (IBEF) predicts that the market share of television will increase by 7.5 percent in 2023 and for print it will increase by 1.4 percent. Photojournalism will rather increase with the help of social media in India. Cheaper data plans encourage people to download pictures and consume news in the form of visuals. Many news organizations have started giving news in the form of photo story, slide shows and multimedia presentation .When Life magazine made the announcement in 1972 that it was ceasing its weekly publication, many people said that this was the end of photojournalism. Photojournalism not only survived but it took a new avatar. Photojournalism is just as impactful on a webpage as it is when viewed on the page of a magazine.

10.2.2 Why Study Photojournalism

Photojournalism is the right field for a creative person who has an eye for detail and loves to travel. One who likes meeting people and is prepared to work for long hours in difficult situations can do well in photojournalism. There are lots of job opportunities for a photojournalist. Websites, news portals, news magazines, TV channels and newspapers are looking for dedicated and efficient camera persons. Apart from joining a company, a good photojournalist can become a freelancer. A degree from a reputed college or a university can be an added advantage for the student. Qualified photographers can join:

- Print and Advertising Industry –magazines, adverts and photo libraries;
- Fashion Industry – creative photography of models and clothing for magazines and catalogues;
- Event Company- social functions, family, wedding and celebrations photography;
- And Corporate (industrial/commercial) – company promotional material

10.2.3 The Camera as a Tool

A camera is a device for recording visual images which may be in the form of pictures or videos. The camera is only a tool. The cameraperson has to master photographic technique. The most important thing is to think of the best way to show the visual regarding the story to the audience. For this, the photojournalist should be able to mentally visualize the shots he wants to show and then plan accordingly. This is achieved by taking the shots from a right perspective. The photojournalist will think about the right angle, content of the frame and the content he wants the audience to focus on.

It is always a wise thing to know as much as possible about the subjects to be photographed and think of all possible different perspectives which could be shown to the reader in order to covey the point. These days' professional photographers use Digital Single-Lens Reflex Camera (DSLR). In DSLR instead of hitting the film, the light which enters hits the sensor. DSLR comes with a zoom lens which have a variable focal length in the range of 35 mm-70 mm.

A good photograph can be powerful and can be an agent for change. Different journalists and photographers approach news stories differently. Some of them highlight the government's failure in a story, whereas some of them shoot to support a public cause. They capture different aspects of life of a common man to highlight their plight and suffering in order to draw the attention of authorities towards these issues. By publishing the pictures of pending projects and unfinished tasks they remind different agencies and also the public to meet their responsibility. For example by publishing pictures of garbage and piles of waste material the photojournalist reminds the citizens of their duty towards maintaining a clean neighbourhood which is free of dirt and diseases.

Good camerawork focuses on the relevant parts of the story i.e. visual parts which are important for storytelling and leaves the rest. The relevant visual parts are photographed in a manner which develops an emotional connect with the audience. Such a photograph with the emotional appeal is liked by the audience and they remember it for long. While doing his camerawork the photojournalist needs to be sensitive towards the feelings of other human beings. Right specifications of focal length, exposure and ISO can bring good results even with an old camera. The specifications depend on whether the photography is outdoor or indoor. The time of the day also affects the quality of the picture. Source of light and the temperature of artificial lights also affect the final picture. A keen study of these parameters will enable a photojournalist to plan his camera work appropriately.

Let us discuss a few technical terms used frequently in photojournalism. A good understanding of these terms is necessary to bring the desired results. The exposure or exposure value is the amount of light received by the camera. If more light goes inside the camera the image becomes overexposed and if the amount of light is less it is underexposed. Inappropriate levels of exposure is seen as noise and affects the message. Many newsrooms reject these images as they are not fit for publication. Three values are considered important when looking at the amount of light entering a camera. a) Shutter Speed, b) Aperture and c) Sensitivity. Shutter speed refers to the time the sensor is exposed to the light and is measured in fraction of seconds. A shutter speed of 1/30 exposes the sensor to light for 1/30th of a second. For most cameras successive shutter

speed roughly halves the exposure time (i.e. 1/30s, 1/60s, 1/120s.) Faster shutter speed is required to capture fast motion like a cycling race or 100 meter sprint. Shutter speed of 1/250s freezes the frame. Higher shutter speed also reduces the amount of light entering the camera. Doubling the shutter speed reduces the amount of light entering the camera by half.

Shutter speed is the duration, i.e. how long light will take to go through the sensor, while the aperture or the iris is the adjustable opening in a camera lens that determines how much light reaches the sensor in a unit time. Aperture settings are given in f-stops and are written as f/1.2, f/2.8, f/4. F-stop is designated in fractions of focal length. Higher values of aperture represent smaller aperture opening which means higher values of aperture allows less amount of light to enter the camera. Lenses with large aperture which allow more light to enter through are called fast lenses. The third key factor which determines the exposure of a picture is the sensor's sensitivity. The sensitivity of a sensor is denoted by ISO. ISO measures the sensitivity of the image sensor. 100 ISO is accepted as a 'normal' or 'standard' ISO and will give fine shots with little noise. The photojournalist has to check the ISO settings when covering different assignments with different light conditions.

A camera lens is an assembly or combination of optical lenses to make images either on film or any optical storage medium. Different types of lenses have different focal length which helps them to be used in different situations. The focal length of a lens is the distance between the lens of a camera and its image sensor when the subject that the camera is pointing is in focus. The focal length is usually stated in millimetres.

Check Your Progress 1

Note: 1) Use the space provided below for your Answers.

2) Compare your answers with those given at the end of the Unit.

1. A good news photograph should answer maximum number of

.....

2. Name four types of news where photojournalism is more relevant

.....

.....

.....

3. Expand the abbreviation - DSLR

.....

.....

.....

4. What marked the start of golden age of photojournalism ?

.....

.....

.....

5. Who is considered as the father of Indian photojournalism ?

.....

.....

.....

6. Mention three values that defines the amount of light enters a camera.

.....

.....

.....

10.3 A PICTURE IS WORTH A THOUSAND WORDS

Photography is a medium which conveys thoughts and feelings without saying a word. In fact a photograph can speak louder than words and the message will be clear and with little noise. Photography as a medium of communication is easy to comprehend for the larger audience as the encoding is quite easy. The encoding in news photography has to be easy so that maximum number of people can understand the message and the photograph serves the desired purpose. The beauty lies in the universal appeal of the photograph. People across cultures and boundaries can understand a photograph and relate to its content.

Photographs in the form of selfies, cellphone snaps, unplanned photos and any time random shots has flooded the social media and internet with visuals in the present visual culture. Anybody can become a photographer and with the help of a good camera and software can do wonders. This massive production of images in the digital form is affecting photojournalism and the importance it used to carry.

Photographs are representations of time and events, light and shadows, and contrasts of vibrant colours. A good photograph speaks to our own emotions and to the thoughts and emotions of others. Photos allow us to express our feelings in a unique way.

The photo could be a portrait that shows an important day of a person's life and catches him or her in a certain mood. The background of a portrait could be mountain, desert or a scenic beauty of any kind. A painter or a sculptor also displays a part of the world as seen and interpreted by him. He uses his perception and creates a static reality of time and events. A photograph on the other hand does all this and also captures the same world where we all live. It depicts different point of reality through a much larger canvas. A photograph transfers the viewer to the place and time shown in the photograph.

10.3.1 Visual Research

Visual research examines the everyday visual culture, which includes the visual signs and markers that we encounter in daily life or in different social situations. It focuses on images. Pictures represent data which is analyzed using different research methodologies. Pictures are also a means of data representation. Visual research also studies representation of human bodies in different social conditions which represent reality. Visual communication is often interpreted differently by different people, i.e. the same message may mean different things to different people. For example an image of dog may mean a companion, a

pet, a guard or a help. Each person's perspective comes from his education, background and culture. Different meanings of the dog could be because of different angle and position in the picture. It could also be because of different size, colour and looks of the dog.

10.3.2 Composition and Aesthetic Value

Composition can be defined as the arrangement of objects within the frame of an image. A photo with good composition and proper values of exposure, contrast and ISO looks pleasing. Good composition directs the eyes of the viewer. A picture with good compositions is easy to comprehend. The photojournalist can plan a good composition after seeing the subject matter of the story. Good composition is achieved through contrast of size and colour, contrast of shape, through patterns, rhythm, distribution of subject/s and props in different planes i.e. the foreground, middle ground and the background. This is achieved by using a wide angle lens which provides good depth of field. Contrast of light can also highlight key components in the frame and hide components which are not required for the story. Bright light can direct the attention of viewer and help him to understand the crux of the visual image. A good photograph with right composition will hold together and will not divide the attention of the viewer.

Composition can be learned by practice and the rules are just guiding principles. These rules can always be bypassed and are not sacrosanct.

The human brain can perform seeing and composition simultaneously. This extremely important skill becomes better with practice. After acquiring these skills a competent photojournalist can easily evaluate his photographs as a whole.

Rule of thirds is one of the most popular rules of composition.. Four lines (2 horizontal and 2 vertical) will divide the frame into 9 parts. Thus the four points of intersections are the key points for placement in the frame. According to this rule the key subject, action or prop in the frame should be placed at the intersections of the imaginary lines that divide the frame into thirds. Placing the subject in the centre of a frame is seen as bad composition. This rule is often useful when it is 2 shot i.e. where two people are talking or fighting. Proper placement of subjects at points can create a high angle shot, a low angle shot and an eye level shot also.

A skilful, creative person with knowledge of visual aesthetics can utilize the full potential of a camera. Simply pointing and shooting the camera, i.e. using automatic controls is not photojournalism or even photography. It is the art of the person behind the camera that produces award winning pictures.

Press photographers are always short of time and rarely have time to plan good composition. In case of breaking news it is quite difficult to plan a shot like this. In case of a portrait, feature or a photo story they have the time and can take photos with high aesthetic values and composition.

10.3.3 Visual Grammar: Shots and Angles

The photograph of a subject whether stationary or moving can be taken from different points of view. These different points of view are captured by

a) changing the angle and the position of the camera or

b) by changing the position of the subject .

The location in both these cases can be the same. Each image will be a different one and will convey a different story. So for a certain event or a news story a cameraman can take multiple shots and experiment with different values of exposure and focal length.

In case of the photography as the camera person changes his position the background changes, lighting changes and so does the composition. The cameraperson can move close to the subject or move his lens close by using zoom lens. Keep in mind that moving the camera close physically is different from moving the zoom lens closer. These two shots will create different perspectives. Often the photojournalist uses a tripod to make the camera stationary especially if the event is of a long duration.

A good photojournalist always prefers to take multiple takes from different angles and positions. Either he uses zoom lens or moves physically closer to the subject or the place of action.

The art of proper visualization helps the photojournalist in the long run. Visualization means to form a mental image of the frame and all that the photojournalist plans to capture in that frame.

Check Your Progress 2

Note: 1) Use the space provided below for your Answers.

2) Compare your answers with those given at the end of the Unit.

1. Explain the qualities of a photograph?

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2. Define the term ‘composition’?

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3. …….. is one of the most popular rules of composition.

4. If the camera moves …….. to the subject the distance …….. and the shot size becomes …… and ……

5. Name two factors that decides the appeal of a shot?

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10.4 NEWS PHOTOGRAPHY

A news photographer should try to capture the essence of a whole story in a single image. This photographer should take pictures as the event unfolds.

This will add credibility to the story. In certain situations the photographer has to wait for the right moment to capture a photo for a news story. He should have patience, perseverance, the ability to predict events and should be a quick thinker. These qualities will help him in situations where the final outcome of a event is not known. It can be court decision, cricket match or a public rally. A good photojournalist covering spot news should always make a contingency plan also to get the shots for his story. The camera person not only has to protect himself, but also has to take care of the equipment and above all he should take plenty of shots for his newspaper or magazine.

10.4.1 News value and Photography

Photography for newspaper includes photographs on a variety of subjects. News photographs are published with hard news as well as with soft news stories. The photojournalist should have a nose for news and he should highlight 'key' component in his photography. Children, traffic, celebrities, politicians, members of society etc. all these are common subjects for news photography. Large organizations hire experienced photojournalists otherwise in small newspapers one persons does both still and video camerawork. Photojournalists also specialize in their work, some of them are good at sports whereas other prefer spot news or breaking news. Depending on the assignment they need to carry a variety of lenses, flash light, additional battery backup, tripod, filters, memory card etc. in their camera bag. News can happen any time of the day. There can be a fire accident at night or a crime which is committed at night. The weather might be sunny and clear or it might be cloudy and dark.

A photojournalist has to chase news and show it through his pictures. Digitalization has not only made the camera better but it has also made the dissemination of videos and photos much faster.

An experienced new photographer would arrive early at an event and would stay late to take some interesting and unusual shots. It is always wise to keep some storage free in the camera to capture expected events which qualify to be shot.

10.4.2 Spot News, Portrait, Sports

Spot News: Photojournalism for Spot news refers to photos which are taken for a time-sensitive news event. The news is governed by the basic values of timeliness, proximity, conflict, prominence and human interest. Typical spot news can be on accidents, fires, political meetings, rallies, elections etc. These events attract large crowds also and a photojournalist would do well if he plans this in advance. In some cases the camera person has to follow the subject also so he can rarely use a tripod. The camera work is all hand held. He should try to take still shots as the camera can also shake in a huge crowd. Special attention is to be given to aperture and ISO in case of breaking news at night. Additional lights and battery backup is a must.

The photojournalist should remember that there are no re-takes in spot news. Failure of equipment at the time of new coverage can make you lose your job. In case of accident, tragedy or big news always look at human loss first, i.e. grab those pictures and after that take pictures of loss of property etc.

3 A portrait attempts to show the nature and emotional state of a person in his world. A portrait shows a person in his place of work, in a social setting and may

highlight his status, authority and contribution etc. A portrait may reveal more about a person's character and show it from new perspective. A good portrait will avoid busy background. Busy background will distract the audience and he/she will not be able to focus on the subject and his environment. Props in a portrait are extremely important as they help in storytelling and help in making the picture complete. Many photojournalists while taking shots for a portrait focus on the face and take close up shots. Photographers also often choose to take portraits against a white or a black background. For group portraits soft light is preferred. Portraits also become interesting when special attention is given to the dress, body language and expressions of the subject. The main challenge for the photojournalist is to make the subject feel comfortable and develop a rapport with him/her. The best method is to start a conversation and gradually the subject starts moving in a comfortable zone. This moment of confidence gives best shots to the photojournalist. In portrait the main light should fall on the side of the face of the subject. It also good to know your subject before planning a portrait. This will help the cameraperson in capturing his personality and attitude in a much better way. A portrait can be a medium shot or a full shot.

Sports photography: Sports photography is about timing. It is about being in the right place at the right time. A photojournalist covering sports has to be an athlete first. He should have good knowledge of all sports and the various rules of all major sports. This knowledge will help him in predicting the game and by this he can plan his camera work in a better way. For example in a 20-20 IPL match the photojournalist should know that after 15 overs the batsman will really go after the ball and there will be more boundaries. So the photojournalist can focus more on the batsman and the movement of the cricket ball. Sports photography is difficult because the movement of a ball, person or a vehicle is to be recorded. This is done by ensuring proper shutter speed, aperture and the use of right lens. Telephoto lens (300mm-400mm) is used in case of cricket or soccer. The faster the lens the faster the shutter speed one can use. Higher shutter speeds are required to freeze the action with long lenses. The position and the angle is of important here as it varies from game to game. In boxing, the camera is to be at eye level whereas in basketball high angle shot is preferred.

10.4.3 Features and Photo Story

A photo feature is about capturing everyday activity or shooting a slice of everyday life. Features are timeless and unlike news pictures do not get stale. For example pictures of former President APJ Abdul Kalam talking to school students is a timeless feature. Photo features evoke a reaction from the audience as they convey emotions to the viewers. Candid shots of celebrities, sports persons, politicians can qualify for features. A person with a creative bent of mind can plan and execute good features. He should have keen eye for details and should observe the surroundings to identify subjects for features. Every big hard story may have some side stories, these side stories may offer some good features. Animals, children, artists, actors, elderly people are great subjects for a feature.

A photo story is based on a theme. The individual pictures in the photo story are on one subject or on one issue. Different pictures support one central idea. There can be photo story on the life of former Prime Minister Atal Bihari Vajpayee. These pictures can be about his political career, family, education

etc. The style of lighting is generally the same and background can be different in different pictures of a photo story. Photo story on political leaders and their achievements often come in news magazines.

10.5 POST PRODUCTION AND EDITING

Editing: Post production is done for effective communication. Editing is done by selecting, cropping, and enlarging certain photographs for a bigger impact. A photo editor may not be a photojournalist. The photo editor may crop the image, check the white balance, check noise, remove noise, and improve sharpness. Resizing and scaling of the images is also done in editing. It is always good to work with 'raw' images during editing. The image formed through the camera sensor is the 'raw' image. Adjustments like conversion into grayscale, and normal toning and minimal colour adjustments are acceptable as long as they restore the authentic nature of the photograph.

10.6 PHOTOJOURNALISM AND ETHICS

Photojournalism provides important information to its audience. This information has to be correct as it is important for decision making. A photojournalist has to show whether the message in the picture is for the larger interest of the society. The photojournalist should also respect the privacy of a person or a family which is involved in the story. Breach of privacy and selling of pictures of a private event is unethical. In a private party or a function it is always good to seek permission before taking pictures. Manipulation is to be avoided. Re-enacting of events or staging of events is seen as manipulation. Adding or deleting of images, substantial background or pros is also counted as manipulation. One has to be careful when taking pictures of a major tragedy like earthquake or an explosion. Mutilated parts of human body are not to be shot and published. Human body and its parts should not be published unless there is requirement as in case of health story. If the publication is for public good then it may be photographed and published. The content of a photograph must not be altered in Photoshop or by any other means. The faces or identities of the subjects must not be altered by image editing tools like Photoshop. Lot of media organizations say that the removal of "red eye" from photographs is not acceptable. Photo editor should not manipulate images or add in any way that misleads the viewers.

Check Your Progress 3

Note: 1) Use the space provided below for your Answers.

2) Compare your answers with those given at the end of the Unit.

1. What do you understand by photojournalism?

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2. Discuss the different types of shot used in photojournalism?

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3. If you are asked to cover a cricket match in your town, what preparations will you do to get perfect pictures?

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4. What are the primary ethical issues that a photojournalist should adhere to?

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10.7 LET US SUM UP

Photography is a creative process of recording pictures by means of capturing light through a camera a on a light-sensitive medium, such as a sensor or film. Light patterns reflected from objects are recorded onto a sensitive medium or storage chip. In newspapers and magazines a photojournalist does with photos what a reporter does with words. A good sense of aesthetics and composition are useful tool for a photojournalist. Besides using the camera he should be computer savvy and be willing to experiment with new technology. Photographers must be well organized, practical, and friendly in nature. Finally they must have excellent communication skills and should work in an ethical framework.

10.8 KEYWORDS

Shutter speed refers to the time the sensor is exposed to the light and is measured in fraction of seconds.

F-stop is designated in fractions of focal length. Higher values of aperture represent smaller aperture opening which means higher values of aperture allows less amount of light to enter the camera.

Close-up (CU) shot shows a character's face and shoulders. It shows subtle facial expressions clearly. It is used to show the emotions of the suffering of a person say after a tragedy.

10.9 FURTHER READINGS

1. Blaney, A., & Shah, C. (2018). The Aesthetics of Contemporary Indian Photography in an "Incredible India". Photography and Culture, 11(1), 3-18.

2. Hoy, F. P. (1986). Photojournalism: the visual approach. Prentice Hall.

3. Kobre, K. (2008). Photojournalism: the professionals' approach. Rutledge.

4. Lester, P. M. (2015). Photojournalism: An ethical approach. Rutledge.

5. Pinney, C. (2008). The coming of photography in India. British Library.

10.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check Your Progress 1

1. A good news photograph should answer maximum number of Ws and H
2. General news stories, spot news, sports news, and Portrait photojournalism
3. Digital Single Lens Reflex Camera
4. Introduction of 35 mm Leica Camera
5. T S Satyan
6. Shutter Speed, Aperture and Sensitivity

Check Your Progress 2

1. Photographs are representations of time and events, light and shadows, and contrasts of vibrant colours.
2. Composition can be defined as the arrangement of objects within an image's frame.
3. Rule of thirds
4. If the camera moves closer to the subject the distance decreases and the shot size becomes bigger and vice versa.
5. Position and Angle

Check Your Progress 3

1. Photojournalism is an effective way of telling stories and disseminating information to a diverse group of people. Photojournalism gives visual support to the news story.
2. Extreme Close-Up, Close-Up, Medium Shot, Wide Shot, and Extreme Wide Shot
3. Sports photography is difficult because the movement of a ball, person or a vehicle is to be recorded. This is done by ensuring proper shutter speed, aperture and the use of right lens. Telephoto lens (300mm-400mm) is used in case of cricket or soccer. The faster the lens the faster the shutter speed one can use. Higher shutter speeds are required to freeze the action with long lenses.
4. A photojournalist has to show whether the message in the picture is for the larger interest of the society. The photojournalist should also respect the privacy of a person or a family which is involved in the story.

UNIT 11: LIGHTING TECHNIQUES - II

Structure

11.0 Introduction

11.1 Learning Outcomes

11.2 Different Lighting Techniques

- 11.2.1 High-Key Lighting
- 11.2.2 Low-Key Lighting
- 11.2.3 Short Lighting
- 11.2.4 Broad Lighting
- 11.2.5 Butterfly Lighting
- 11.2.6 Other Types of Lighting

11.3 Lighting Instruments and Accessories

- 11.3.1 Different Types of Lights
- 11.3.2 Lighting Accessories

11.4 Let Us Sum Up

11.5 References and Further Reading

11.6 Check Your Progress: Possible Answers

11.0 INTRODUCTION

We have already discussed that lighting plays a crucial role in photography, video production and film making. So we are discussing this topic in detail and have included two units on lighting. This is the second unit. In the previous unit (Unit No. 3), we discussed the importance of lighting, different characteristics of light, fundamentals of lighting and basic lighting techniques, i.e. three-point lighting and four-point lighting. In this unit, we will take this discussion further. Here we shall talk about some useful lighting setups and techniques. Apart from this, this unit also gives information about different types of lights and lighting accessories.

11.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- discuss the different lighting setups and techniques used in photography and video production;
- explain about the different types of lights commonly used in photography and video production; and
- know about various lighting accessories.

11.2 DIFFERENT LIGHTING TECHNIQUES

In this section, we shall discuss some important lighting techniques in detail.

11.2.1 High-Key Lighting

High-key lighting is a lighting technique where the difference between the brightest area and the darkest area in the image is very low. It has low contrast. It means, there is not much variation in the amount of light in the entire frame. If you see a scene or image that has enough light on everything that comes inside the frame, it is an example of high-key lighting. It displays an upbeat mood. High-key lighting is used in cheerful scenes, television news, TV interviews etc. High-key lighting can be done by using more fill light or soft/diffused light.

Figure 1: High-key lighting

12.2.2 Low-Key Lighting

This is just opposite to the high-key lighting. In scenes or pictures where low-key lighting is used, the contrast is greater. That is, there is a considerable difference in the amount of light at the brightest and darkest areas in the frame. Low-key lighting is used to create drama. It is considered to be aesthetically more creative and frequently used in films. It attracts the viewers' attention to a specific area in the frame. Low-key light is also used in portrait photography. Generally, we use only key light in low-key lighting. We should use hard light as the key.

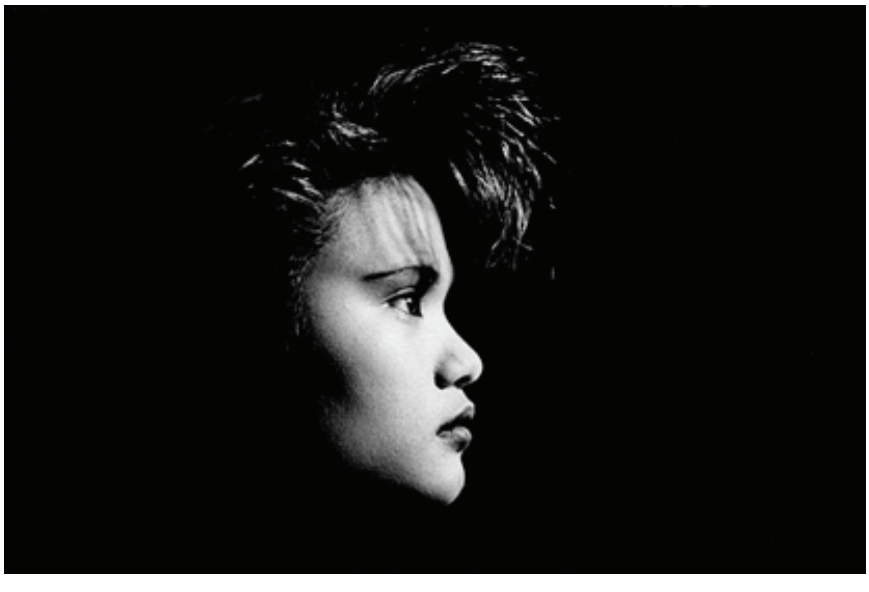

Image Source: Malber / CC BY-SA (http://creativecommons.org/licenses/by-sa/3.0/), https://upload.wikimedia.org/wikipedia/commons/e/e4/Stacy100dpi.jpg

Figure 2: Low-key lighting

11.2.3 Short Lighting :

Short lighting is a technique used in photography, film production, and video production. In this lighting setup we position the key light source to illuminate the side of the subject's face that is farther from the camera. This lighting setup creates dramatic effects by emphasizing the shadows on the subject's face, and can be used to add depth and dimension to a shot.

11.2.4 Broad Lighting

In broad lighting setup, the subject is positioned facing slightly away from the camera. The key light illuminates the side of the face that is closer to the camera. This creates a broad, even illumination across the face, with softer shadows and highlights than would be seen in a more dramatic lighting setup.

Since broad lighting makes faces appear wider, we should use it photographing subjects with narrow or angular faces. You must avoid broad lighting on subjects with wide faces, it can enhance the shape of their face. It can also be used to create a more natural or relaxed look, as it produces softer shadows and highlights.

If your subject has a feature on one side of their face that you want less emphasis on, simply place the feature on the smaller side of the face and use broad lighting to cover it in shadow.

11.2.5 Butterfly Lighting

Butterfly lighting is a portrait lighting technique commonly used in photography and film. It's named after the butterfly-shaped shadow that appears under the subject's nose, which is a distinctive feature of this lighting setup.

In butterfly lighting setup, the key light is positioned directly in front of the subject, above their head, and angled downwards. It illuminates the subject's face from above, creating shadows under the cheekbones and chin.

The fill light, which is placed below the subject's face, is aimed upwards towards their chin. The purpose of the fill light is to soften the shadows created by the key light and provide a more even illumination.

The combination of the key light and fill light creates a butterfly-shaped shadow under the subject's nose, which is the hallmark of this lighting setup. The result is interesting and dramatic.

Butterfly lighting is particularly effective for portrait photography, especially for beauty and fashion shots. It can be adjusted to create different moods and styles by changing the angle and intensity of the lights, and by adding or subtracting additional lights to the setup.

Check Your Progress : 1

Note : Use the space given below for your answers.

Compare you answers with those given at the end of the unit.

1. Highlight the differences between following:
   a. High-key lighting and Low-key lighting
   b. Short lighting and Broad lighting

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12.5.5 Other Types of Lighting

Now, we shall discuss some other popular lighting techniques used in television production and photography.

Split Lighting: When we place the key light at the 900 from the camera, it illuminates half of the subject's face. Half of the face is bright and half is in the shadow. Since this type of light splits the face into two almost equal parts (half illuminated and half dark), it is called split lighting. It creates dramatic effects. Figure (3) shows the example of split lighting.

Figure 3: Split Lighting

Flat Lighting: The lighting which produces very minimum shadow is called flat lighting. In flat lighting, you will find very little contrast. It lacks depth and details. It gives uniform illumination across the frame. If we illuminate the entire frame area with a large light source, the effect of flat lighting is created. The effect of flat lighting can also be created by illuminating a subject from the front. The camera mounted lights result in flat lighting. If we keep the intensity of key and fill lights the same (1:1), it will create flat lighting. Although flat lighting makes the image or shot visually dull but it also has some advantages. With the help of flat lighting, we can hide skin imperfections like blemishes, wrinkles, etc.

Silhouette Lighting: The silhouette lighting effect can be created if you turn off the lights illuminating the subject from the front (key and fill light) and keep the background light on. Silhouette lighting produces a dramatic effect. It is also used in television news channels or documentary films to hide a person's identity. Following figure (4) shows an example of silhouette lighting.

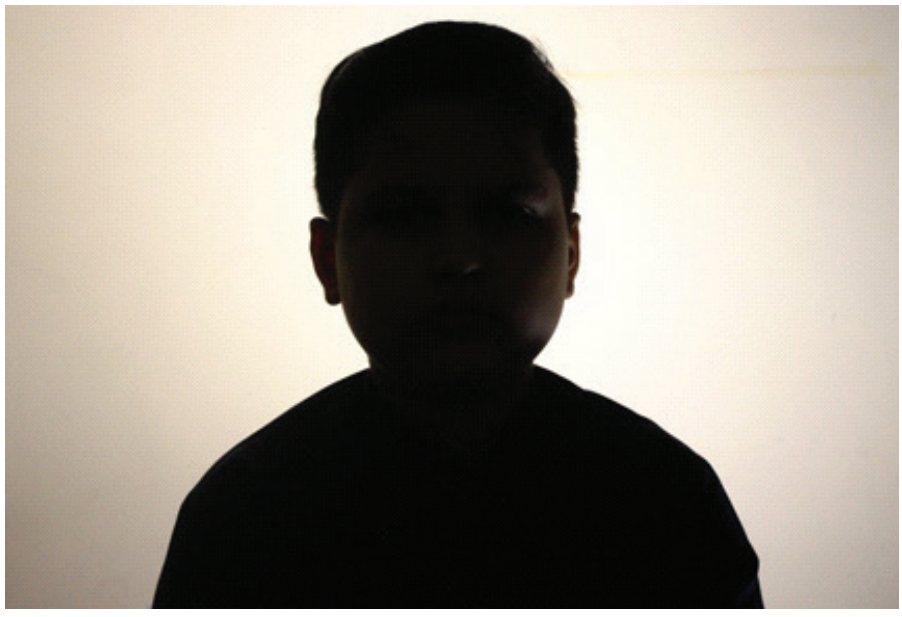

Figure 4: Silhouette Lighting

Cameo Lighting: In this lighting technique, we place the subject in front of the dark background. Light is thrown only to the subject from the front and the whole background is completely dark. Cameo lighting can be done with the help of spot lights. The objective of this type of lighting is to bring the entire focus of the audience to the highlighted portion of the composition.

Check Your Progress : 2

Note : Use the space given below for your answers.

Compare you answers with those given at the end of the unit.

1. What is split lighting ?

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2. Explain flat lighting.

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……

11.3 LIGHTING INSTRUMENTS AND ACCESSORIES

Lighting requires different equipment. In this section, we shall discuss different types of lights and lighting accessories.

11.3.1 Different Types of Lights

Different types of lights are used in photography and television programme production. Here, we shall discuss some of them.

Spotlight and Floodlight: On the basis of the spread of the light beam, we can classify lights into two categories - spotlight and floodlight. Spotlight creates narrow light beam, generally not more than 450. It is used to highlight a small

area or a particular subject/object. The floodlight, on the other hand, produces wider light beams and can illuminate larger areas.

Tungsten Halogen: It is an incandescent lamp that produces light by heating a tungsten filament. Since halogen gas is also used in this light, it is called tungsten halogen. It is very cheap and earlier it was very popular in video production. It is a powerful light that can produce high intensity light. Tungsten halogen gives yellowish light with 3200K colour temperature, so does not match with daylight. Its energy efficiency is quite low and it produces a lot of heat as a by-product. In the context of light, energy efficiency means what percentage of the consumed electricity is converted into light. More energy efficient lamps produce more light by consuming the same amount of electricity.

HMI Light: HMI stands for hydrargyrum medium-arc iodide. This light came into the market in the 1960s. It became very popular among filmmakers. It has many advantages. HMIs are nearly four times more energy-efficient than tungsten. It also produces heat but much less than tungsten. It gives high intensity light with 5600K to 6000K colour temperature which matches with daylight. With a strong HMI light, you can create the effect of a sunny day even at night. These lights are also used as fill lights during daytime exterior shoot. But HMIs are very expensive and require enough expertise to handle them.

Fluorescent Light: Fluorescent lamps produce soft light. They can emit light with different colour temperatures. They are more energy efficient than incandescent lights, therefore producing very little heat. Since a single fluorescent lamp or tube cannot produce adequate light, you will find fluorescent banks in studios with 2, 4 or 6 tubes.

LED Lights: LED stands for Light Emitting Diode. These are the most energy efficient lights that produce the lowest heat. You can keep these lights closer to the subject. Their lifespan is also longer than incandescent and fluorescent lights. LED lights are also robust. They can produce light of different colour temperatures. LED is rapidly gaining popularity in the television and film industry. It is considered the light of the future.

Figure 5: LED Camcorder Light

(A battery operated LED light with diffuser and barn doors. It can be mounted on the camcorder)

Sungun: Sungun is quite a popular light in video production. It is very cheap and handy. You can mount it on the camera or put it on light stand by using

the adapter. It can also be used by holding it in the hand. When mounted on cameras, it illuminates the subject from the front and creates flat lighting. Earlier, tungsten halogen lamps were used in sunguns, but now LED sunguns are also very popular.

Fresnel Light: Fresnel lights are lights that use Fresnel lenses. These lenses are used to produce light beams of different angles and named after their inventor, Augustin-Jean Fresnel, who invented this lens initially for use in lighthouses. You can make wider and narrower light beams with the same light. Different companies make fresnel lights with different beam ranges but commonly these lights can produce light beams between 14o to 55o. Fresnel lights are available with tungsten lamps as well as LEDs.

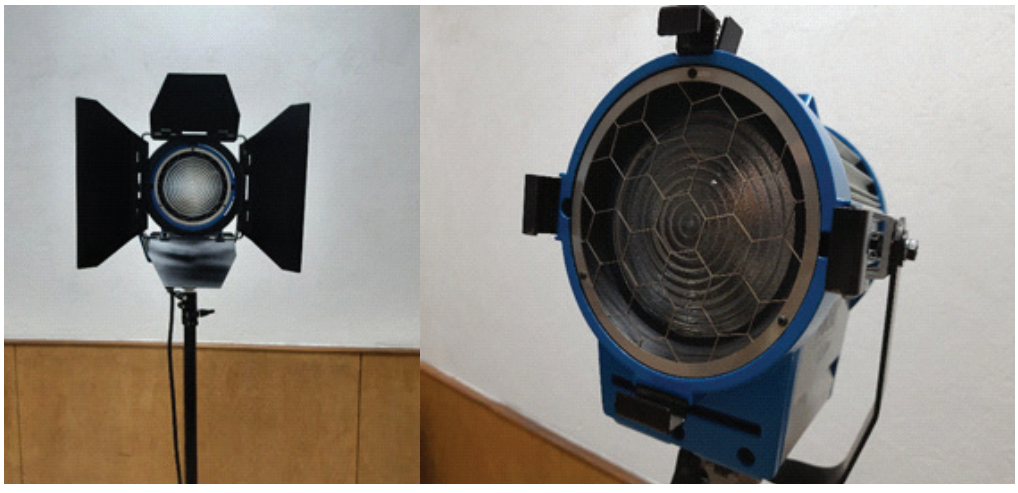

Figure 6: Fresnel Light

11.3.2 Lighting Accessories

Lighting accessories also play a very significant role in the whole lighting process. Now, we shall discuss about some important lighting accessories.

Gels: Gels are transparent sheets that can be placed in front of light sources to modify the colour temperature, colour, quality, or intensity of light. Generally we use four different types of gels in photography or television production - neutral density gels, diffusion gels, colour correction gels and colour effect gels. Neutral density gels are used to reduce light intensity. By using these gels, you can cut the brightness of the light without affecting other light properties. Diffusion gels diffuse the light and make it softer.

Colour correction gels are used to modify the colour temperature of the light. There are two main colour correction gels - CTB and CTO. CTB stands for Colour Temperature Blue. It is used to cool the lights. With the help of CTB, you can convert tungsten (3200K) into daylight (5600K). The second is CTO. CTO stands for Colour Temperature Orange. This is the opposite of CTB. It is used to warm up the lights. You can convert daylight (5600K) to tungsten (3200K) using this gel. The last one is the colour effects gel. Colour effects gels modifies the colour of light. You can create colourful backgrounds with the help of these gels.

Light Stand: Light stands are used to mount different types of lights. You can adjust the height of the light stand according to your needs. Following figure (7) shows a light stand.

Figure 7: Light Stand

Barndoors: Barndoors are fixed in front of the lights. 2-leaf or 4-leaf barndoors are very common. They are used to shape light beams. With the help of barndoors you can also cut the light and experiment with many creative lighting patterns. Following figure (8) shows a 4-leaf barndoor.

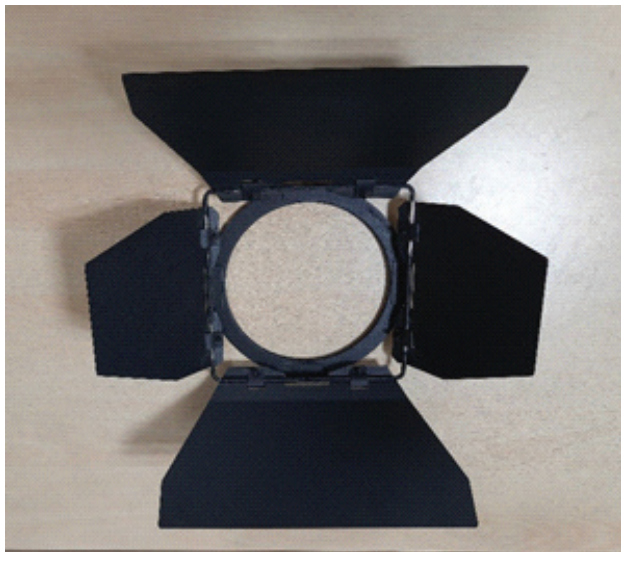

Figure 8: 4-leaf Barndoor

Scrim: Scrim is a metal mesh like device which mainly reduces the intensity of light. It does not affect the colour temperature. Scrim comes in different strengths which reduces light to varying amounts. Single scrim reduces the intensity of the light by a quarter, while the double scrim reduces it by half. If you place a double scrim in front of the 650W light, its intensity will be reduced to 325W. In incandescent lights, if you use dimmer to modify the intensity, its colour temperature will be affected. So, it is more appropriate to use scrims. In the figure (9) below, the scrim with a green frame is a single scrim, while the red one is a double scrim.

Figure 9: Single and double Scrims

Reflectors: The reflectors are used to reflect light. Reflectors are used in both outdoor and indoor shoots in photography or television production. We also often use reflectors as fill light and back light. Suppose we are taking the sun as our key light, then with the help of reflectors we can reflect the sunlight and use it as fill and back. Reflectors are used extensively in lighting. You can see the different reflectors in following figure (10).

Image Source: Scott Riggle (CC BY 2.0)

https://www.flickr.com/photos/scottriggle/13876212595/in/photolist-n9cdyK-FfnLM-4mh6NR-5fqQS-4WsXpn-jRWbkr-5ri2HL-8jgAdY-qwY7gK-imwYx8-gYsZXS-imwUCK-s1Xed-9KHjYx-pVzXV-fNd1qe-c2MPum-dNGSAy-7tgYN7-Ffktd-2UnSee-9rr9gD-2UjXk6-ff3Jh8-2Uthbu-2UkYLk-aw7J2H-yAW72-aVudMc-4odVV-c2MP4G-2V3nNB-5bwTt2-d2K8QL-nUrQJT-pmKig1-k2Y8pc-9CQWe3-9yE1kN-9zNetE-7VMJ7d-2WzeSE-8EnS7e-aknnMq-8UtTe4-59dJfF-fNd1rk-2V3px6-2V7No9-gYt3Wf

Figure 10 : Reflectors

Softbox: Softbox is used to soften the light. It diffuses the light, which makes the hard light relatively soft. It is used extensively in photography and television production. Its side and back walls are shiny which reflect the light and there is a diffuser in front which diffuses the light and produces soft light. Softboxes come in different shapes and sizes. Larger softboxes will produce softer light than the smaller ones.

Image Source: By Dmitry Makeev - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=78089122

Figure 11: Softbox

Check Your Progress : 3

Note : Use the space given below for your answers.

Compare you answers with those given at the end of the unit.

1. List any five important lighting accessories.

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2. CTO stands for _____.

   a. Colour to Orange

   b. Colour Temperature Opposite

   c. Colour Temperature Optimum

   d. Colour Temperature Orange

3. CTO and CTB gels perform opposite functions.

   a. True

   b. False

4. Fresnel light uses a lens.

   a. True

   b. False

5. What is cameo lighting?

……
……
……..

11.4 LET US SUM UP

In this unit we discussed various lighting techniques like high-key lighting, low-key lighting, short lighting, board lighting, butterfly lighting, flat lighting, silhouette lighting, cameo lighting, and split lighting. Various types of lights and lighting accessories used in photography and video production have also been described.

11.5 REFERENCES AND FURTHER READING

Belavadi, *V. (2013). Video Production. Oxford University Press.*

Blain Brown, *D. (2017). The cinematographer's companion: A guide to location lighting techniques (5th ed.). Burlington, MA: Focal Press*.

Box, *H. (2018). Television production handbook (12th ed.). Boston, MA: Wadsworth*.

Millerson, *G. (2010). Lighting for television and film (3rd ed.). Oxford, UK: Focal Press.*

Viera, *P. (2014). The television lighting handbook (3rd ed.). New York, NY: Routledge*.

11.7 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check You Progress 1

1.

a. High-key lighting is a lighting technique where the difference between the brightest area and the darkest area in the image is very low. It has low contrast. It means, there is not much variation in the amount of light in the entire frame. On the other hand low-key lighting is just opposite to the high-key lighting. In scenes or pictures where low-key lighting is used, the contrast is greater. That is, there is a considerable difference in the amount of light at the brightest and darkest areas in the frame.

b. Short lighting is a technique used in photography, film production, and video production. In this lighting setup we position the key light source to illuminate the side of the subject's face that is farther from the camera. On the other hand in broad lighting setup, the subject is positioned facing slightly away from the camera. The key light illuminates the side of the

face that is closer to the camera. This creates a broad, even illumination across the face, with softer shadows and highlights than would be seen in a more dramatic lighting setup.

Check You Progress 2

1. When we place the key light at the 900 from the camera, it illuminates half of the subject's face. Half of the face is bright and half is in the shadow. Since this type of light splits the face into two almost equal parts (half illuminated and half dark), it is called split lighting. It creates dramatic effects.

2. The lighting which produces very minimum shadow is called flat lighting. In flat lighting, you will find very little contrast. It lacks depth and details. It gives uniform illumination across the frame. If we illuminate the entire frame area with a large light source, the effect of flat lighting is created. The effect of flat lighting can also be created by illuminating a subject from the front. The camera mounted lights result in flat lighting. If we keep the intensity of key and fill lights the same (1:1), it will create flat lighting.

Check You Progress 3

1. Gels, reflectors, softboxes, scrims, barndoors

2. d. Colour Temperature Orange

3. a. True

4. a. True

5. In cameo lighting, we place the subject in front of the dark background. Light is thrown only to the subject from the front and the background is completely dark. Cameo lighting can be done with the help of spot lights.

UNIT 12: SHOT SIZES & CAMERA ANGLES

Structure

12.0 Introduction

12.1 Learning Outcomes

12.2 Moving Images

12.3 Shot, Scene and Sequence

12.4 Shot Sizes

- 12.4.1 Extreme close-up (ECU)
- 12.4.2 Close-up (CU)
- 12.4.3 Medium close-up (MCU)
- 12.4.4 Medium shot (MS)
- 12.4.5 Medium long shot (MLS)
- 12.4.6 Long shot (LS)
- 12.4.7 Extreme long shot (ELS)

12.5 Camera Angles

- 12.5.1 Eye-level shot
- 12.5.2 High-angle shot
- 12.5.3 Low-angle shot
- 12.5.4 Other Camera Angles

12.6 Other Types of Shots

12.7 Let Us Sum Up

12.8 Further Readings

12.9 Check Your Progress: Possible Answers

12.0 INTRODUCTION

When we record a sequence of still images and show them at a particular speed, it creates an illusion of motion and we see moving images. Movies, videos, and animations are all examples of moving images. It is a visual art form that is used to convey desired messages. Generally, we use moving images with a combination of sound.

If you want to use this art form, you must have an understanding of visual language. Visual language has its own grammar. Shot sizes, camera angles and camera movements are its important elements. In this unit, we shall discuss the different types of shot sizes and camera angles used in filmmaking or video programme production. Camera movements will be discussed in the next unit. Once you will understand the basics of visual language, you can use it in different types of audiovisual productions, such as – television news programmes, documentary films, short films, etc. For example, if you know the

English language, you can use this language for writing different pieces like stories, news reports, science books, articles, novels, etc. The style of language may be different in story writing, news writing or science book writing, but the basics and grammar of the language will remain the same. The same logic is also applicable to visual language.

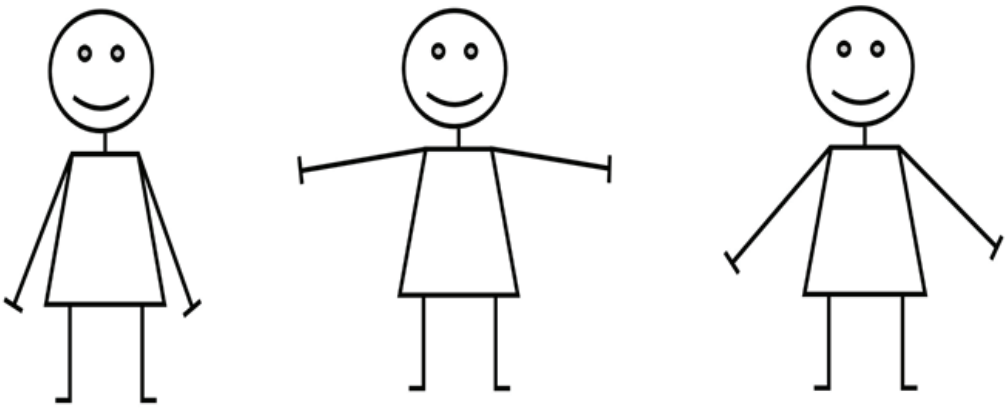
12.1 LEARNING OUTCOMES

After reading this unit, you will be able to:

- understand the concept of moving images;
- know the different types of shot sizes used in film and video production;
- describe various camera angles;
- explain the purposes of different types of shot sizes and camera angles; and
- select suitable shots for your film or video production.

12.2 MOVING IMAGES

We see images moving in films, videos, animations and multimedia content. Moving images capture a large share of our media and entertainment industry but the interesting thing to note is that we cannot record true motion or movement. We can record only still images (frames) and we show them in a way that creates an illusion of motion. Following images explain this concept:



(Image - 1) *(Image - 2)* *(Image - 3)*

Here, we have three images with different postures of hands. In Image-1, both hands are slightly away from the body. In image-2, the hands are slightly farther away from the body and in image-3, the hands are even farther away from the body. All three are still images but if you show them in quick succession, it will create an illusion of motion of the hands. Illusion of motion is created by showing a series of consecutively recorded still images in speedy succession. All types of moving images including films and videos work on the same concept.

We experience motion due to eye and brain functions. Theories of Persistence of Vision and Phi-phenomena explain the experience of motion by humans. Traditionally, Persistence of Vision was thought to be the cause of this motion illusion. According to this theory, the human eye cannot distinguish between still images if they come at high speeds (typically more than 16 images in

a second) and view them in continuity. If we show a series of continuously recorded still images in quick succession, illusion of motion will be created. But this theory has already been challenged.

12.3 SHOT, SCENE AND SEQUENCE

Similar to written language, visual language (the language of moving images) also has different units. You can equate letters with frames, words with shots, sentences with scenes, paragraphs with sequences and the whole story with the complete film. Shot, Scene and Sequence are three important units of the visual language of moving images. In this section we shall discuss them in detail.

Shot: Though the letter is the smallest unit of written language, it lacks meaning. Collection of letters forms a word which carries some meaning. So, we can say that word is the smallest meaningful unit of the written language. Similarly, a shot is the smallest meaningful unit of the visual language of moving images . It is a collection of frames. As we discussed above, frame is a still image recorded by the camera and many frames together form a shot. As you know that by playing sequential still images at a certain speed, the experience of movement can be created, and all the moving images products work on the same concept.

In filmmaking or video production, you can define a shot as the recording or footage without any break. A shot is single unbroken footage or recording. You can also say that shot is footage or recording from one cut to another cut. The duration of a shot may be a few seconds or up to several minutes. If you see any film cautiously you can easily identify different shots.

Scene: The scene is comparatively a bigger unit and may be composed of many shots. A scene presents a small unit of the story and takes place at a specific location and time. If the location or time changes, the scene will change.

Let us take few examples. We are showing that a character is reading a book in his bed at night. After some time, he turns off the lights and falls asleep. The next day morning, he wakes up with the harsh sound of his alarm. Here, we have two scenes as time changes. The first scene is of night and the second scene is of day. In the same way, if we show that a woman is doing some work in her house in the morning and after some time she leaves her house and walks to the park next to her house. The scene also changes here due to changing location. Therefore, if the place or time changes, the scene will also change.

Sequence: As we discussed above, if scenes are sentences then sequence is a paragraph. A sequence is made up of many scenes which delivers a unit of the narrative. Different scenes of a sequence may be connected with unity of time or location or event or theme.

We can discuss this with an example. Take the marriage sequence of a film as an example. When we say marriage sequence, it means that this sequence contains all the scenes related to the marriage of the characters in the story. This sequence may include the bridegroom's wedding procession, the bride's room scene where she is talking to her friends, the discussion scene between the bride's father and the bridegroom's father, scene of marriage rituals, and all other scenes related to that particular marriage. Here this marriage sequence shows a small unit of the whole story.

12.4 SHOT SIZES

Shots can be classified by the size of the subject captured in the frame. Here, you need to know about the two terms: 'subject' and 'frame'. First, what do we mean by subject here? In this context, the subject may be the character or any object which is the centre of interest for the camera. In other words, a subject is a character or object which will be in focus during recording. More than one character or object may also be treated as subjects.

Now, what is the frame? Actually, frame is a still image and the smallest unit of any film or video. As we discussed earlier, a number of frames together make a shot. In this context, frame is the space of that still image available to a director or cinematographer to compose a shot. You can also say that frame is an area which is captured by a camera and visible to the audience. Anything which is out of frame during shooting is not part of the film because it is not captured by the camera.

On the basis of the subject's size captured in the frame, shots can be divided into three basic types: close-up, medium shot and long shot. These three basic shots can further be divided into few other types. So, in general, on the basis of the subject's size captured in the frame, you can classify shots into seven following types:

i. Extreme close-up (ECU)

ii. Close-up (CU)

iii. Medium close-up (MCU)

iv. Medium shot (MS)

v. Medium long shot (MLS)

vi. Long shot (LS)

vii. Extreme long shot (ELS)

Now, we shall discuss these shot sizes in detail.

12.4.1 Extreme close-up (ECU)

It is closer than the close-up shot and captures a part of the face. It is abbreviated as ECU. An extreme close-up shot is used to show the important details of a smaller area. You can use this shot to reveal some important marks on your character's face or some important and meaningful activities of your character's eyes, lips etc. It helps to show detailed facial expressions and emotions. An extreme close-up of a character's tearful eyes helps the director to reveal the character's emotion beautifully. Extreme close-ups of shining teeth are commonly used in the advertisement films of different dental products. Figure (1.1) is an example of the extreme close-up shot.

Figure 1.1 Extreme close-up shot

12.4.2 Close-up (CU)

It captures the whole face. The whole frame is mainly covered with the face only, so negligible background information is available. Close-up shots are used to show facial expressions and emotions. These shots provide opportunity to actors and actresses to show their acting skills. Close-up shots are frequently used as reaction shots to show the character's reactions and emotions. It is abbreviated as CU. Figure (1.2) shows an example of close-up shot.

Figure 1.2 Close-up shot

12.4.3 Medium Close-up (MCU)

A medium close-up shot is generally framed from just below the armpit or lower chest. This shot is also called head and shoulders shot because it captures head and shoulders both. Bust shot is one more popular name of medium close-up. You can use this shot to show your character's reactions and emotions. It reveals some information about the background. Figure (1.3) shows an example of medium close-up.

Figure 1.3 Medium close-up shot

12.4.4 Medium Shot (MS)

It is also called as mid-shot. In a medium shot, you frame your character from just above or below the waist. It reveals information about the background. You can capture the body language and the activities of the characters. Figure (1.4) shows an example of medium shot.

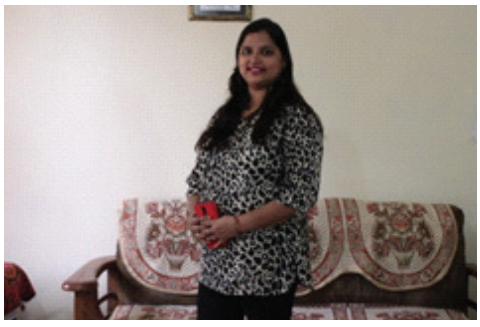


Figure1.4 Medium shot

12.4.5 Medium Long Shot (MLS)

It is an intermediate shot between the medium shot and the long shot. In a medium long shot, you should frame your character from just below or above the knees. It is also called as three-quarters shot because it covers three quarters of your character. The medium long shot reveals enough information about the background. You can show the activities of your characters through the medium long shot. Figure (1.5) shows an example of medium long shot.

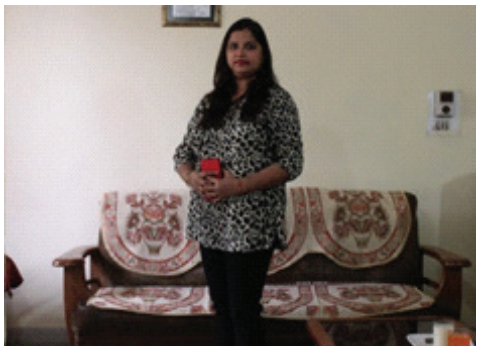


Figure 1.5 Medium long shot

12.4.6 Long Shot (LS)

Sometimes it is also known as wide shot or full shot. In the long shot, you frame the full body from head to toe. Long shot puts your character in the context. You can use this shot to establish your location. It provides detailed information about the background. You can show the activities of your characters with clear background details through this shot. Figure (1.6) shows the example of a long shot.

Figure1.6 Llong shot (LS)

12.4.7 Extreme Long Shot (ELS)

In this shot, background or location is more dominant than the character. It gives a larger view of the location. An extreme long shot is often used as an establishing shot to establish the location. Generally, it comes at the beginning of any film or sequence to show the larger view of the location. You can see the example of an extreme long shot in figure (1.7).

Figure 1.7 Extreme long shot

Activity 1

Shoot short video clips showing all seven shot sizes. You can use any type of video camera including a smartphone.

Check your progress: 1

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is shot ?

.....

.....

.....

2. Explain the difference between scene and sequence.

.....

.....

.....

3. When should we use a close-up shot?

.....

.....

.....

4. Which of the following is used to establish a location ?

   a. Medium Shot

   b. Extreme long shot

c. Extreme close-up

d. Close-up

5. Persistence of Vision is related to _____.

a. Contrast colour

b. Camera model

c. Illusion of motion

d. Recording format

12.5 CAMERA ANGLES

Camera angle tells about the placement of the camera in relation to the subject. For example, if the camera is placed at a higher place to the subject, it will be called high-angle and the vice-versa. Camera angle plays a very important role in the recording of moving images. It is a significant element of visual grammar that contributes to meaning creation. If you shoot the same subject with different camera angles, different meanings may be created. So, the camera angle is used as an important tool for visual storytelling. You can also divide shots into different types on basis of the camera angle used. In this section, we shall discuss the different camera angles in detail.

12.5.1 Eye-level shot

It is a normal shot. You can frame an eye-level shot by placing the camera at the eye level of the character. The eye-level shot provides a normal viewing effect. It is a common and most utilized shot. All the pictures from the figure (1.1) to (1.7) are the examples of eye-level shots.

12.5.2 High-angle shot

As the name suggests, in a high-angle shot, the camera is placed at a higher level. It gives an effect as though you are looking down at the subject. You can use a high-angle shot to show your character weaker or less important. High-angle shots are also used to show those things which cannot be shown through an eye-level shot. Figure (1.8) presents an example of a high-angle shot.

Figure1.8 High-angle shot

12.5.3 Low-angle shot

In this type of shot, you place the camera at a lower level. It gives the effect as though you are looking up at a taller or bigger thing. The low-angle shot makes the subject stronger, important and dominant. Figure (1.9) is an example of a low-angle shot.

Figure 1.9 Low-angle shot

12.5.4 Other Camera Angles

In addition to these three fundamental camera angles (eye-level, high-angle and low-angle), there are some other angles used in video or film production. Here, we shall discuss them briefly.

i. **Bird's eye view shot:** This shot provides a view as if a bird observing something on the ground from the sky. It is also called an overhead shot. In this type of shot, you place the camera just above the subject and location. This shot gives a complete view of the location where the action is going on. You can use this shot to reveal information about the location and action which are not possible to be shown through a high-angle shot. Figure (1.10) shows an example of a bird's eye view shot.

Figure 1.10 Bird's eye view shot

ii. **Worm's eye view shot:** It is an extreme low-angle shot. It gives an effect similar to a worm looking at the bigger or taller things. You can frame a worm's eye view shot by placing the camera far below the subject. It exaggerates the subject's appearance and makes it very strong and dominant like a giant. Figure (1.11) shows the example of a worm's eye view shot.

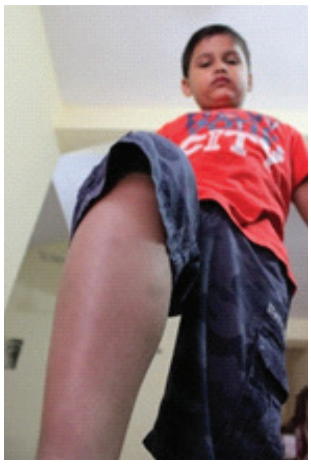


Figure 1.11 Worm's eye view shot

iii. **Dutch Angle or Dutch Tilt :** It is also known as canted angle. The Dutch angle allows the camera to roll on its axis so that the horizon is not parallel with the bottom of the frame. The desired effect of a Dutch angle is as if the viewer tilts his head from one side to the other. Generally, Dutch angle is used to evoke tension, uneasiness, stress or a psychological breakdown of the characters.

Activity 2
Shoot the same subject from eye-level, high angle and extreme low angle (worm's eye view). Compare the results.

Check your progress: 2

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is camera angle ?

.....

.....

.....

2. How is high-angle shot different from eye-level shot ?

.....

.....

.....

3. When should we use low-angle ?

.....

.....

.....

4. Which of the following is called overhead shot ?
   a. Medium Shot
   b. Bird's eye view shot
   c. Worm's eye view shot
   d. Low-angle shot
5. Generally, Dutch angle is used to evoke tension.
   a. True
   b. False

12.6 OTHER TYPES OF SHOTS

There are few other types of shots which are used frequently in filmmaking or video production. You should know about these shots. These are following:

1. **Over-the-shoulder shot (OTS):** Figure (1.12) shows an example of over-the-shoulder shot. The name of this shot refers to the placement of camera just behind the shoulder of a character, presenting a view of what the character sees. Generally, it is used to show conversations between two characters.

Figure 1.12 Over-the-shoulder shot (OTS)

2. **Point-of-view shot (POV):** Point-of-view shot shows the things from the viewpoint of a character. Figure (1.13) shows the example of a point-of-view shot.

Figure 1.13 Point-of-view shot

3. **Reaction shot:** Reaction shot is very important in visual storytelling. You frame this shot to show the reaction of a character on any dialogue or action. For example, just imagine a scene in which three characters are discussing something. One of the characters reveals a shocking information. Now you will have to show the reactions of other two characters through reaction shots. Reaction shots show the facial expressions and emotions of the characters. Generally, reaction shots are framed as close-up or medium close-up shots. An example of reaction shot is shown in figure (1.14).

Figure 1.14Reaction shot

12.7 LET US SUM UP

In this unit, we have discussed the different shot sizes and camera angles. If you want to write a story, knowledge of the language is a must. In the same way, moving image productions (films, documentaries, etc.) require the understanding of visual language and its grammar. Once you understand the visual language well, you can use it to produce any type of film, documentary, television news programmes, etc. Shot sizes and camera angles are very crucial elements of visual grammar. A proper understanding of these elements will help you to produce good films or documentaries which can communicate their message properly, smoothly and interestingly.

12.8 FURTHER READINGS

Belavadi, V. (2013). Video Production. Oxford University Press.

Macelli, J. V. (2005). Five C's of Cinematography: Motion Picture Filming Techniques.

Thompson, R., & Bowen, C. (2009). Grammar of the Shot. Taylor & Francis.

12.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check your progress: 1

1. Shot is a recording or footage without any break. A shot is a single unbroken footage or recording. You can also say that the shot is footage or recording from one cut to another. The duration of a shot may be a few seconds or several minutes.

2. Generally, a scene is composed of several shots. A scene presents a small unit of the story and takes place at a specific location and time. If the location or time changes, the scene will change. On the other hand, a sequence is made up of many scenes which delivers a unit of the narrative. Different scenes of a sequence may be connected with unity of time or location or event or theme.

3. Close-up shots are used to show facial expressions and emotions. These shots provide opportunity to actors and actresses to show their acting skills. Close-up shots are frequently used as reaction shots to show the character's reactions and emotions.

4. b. Extreme long shot

5. c. Illusion of motion

Check your progress: 2

1. Camera angle tells about the placement of the camera in relation to the subject. For example, if the camera is placed at a higher place to the subject, it will be called high-angle.

2. Eye-level shot is a normal shot. We can frame an eye-level shot by placing the camera at the eye level of the character. The eye-level shot provides a normal viewing effect. It is a common and most utilized shot. On the other hand, in a high-angle shot, the camera is placed at a higher level. It gives an effect as we are looking down at the subject. We can use a high-angle shot to show your character weaker or less important.

3. If we want to show the subject stronger, important and dominant, we should use low-angle shots.

4. b. Bird's eye view shot

5. a. True

UNIT 13: CAMERA MOVEMENTS

Structure

13.0 Introduction

13.1 Learning Outcomes

13.2 What is Camera Movement ?

13.3 Camera Movements : Different Types

13.3.1 Pan

13.3.2 Tilt

13.3.3 Dolly/Track

13.3.4 Other Camera Movements

13.4 Camera Movements and Composition Rules

13.5 Let Us Sum Up

13.6 Further Readings

13.7 Check Your Progress: Possible Answers

13.0 INTRODUCTION

Camera movement is a crucial aspect of any type of audio-visual production, be it television production or film production or content generation for online platforms. The proper knowledge of different camera movements is essential if you are shooting videos using any type of camera – professional to smartphones. Different types of camera movements are used with different purposes. They aid in the process of storytelling. Appropriate camera movements can create emotion, show different perspectives, and add interest to a video. In this unit, we shall discuss different types of camera movements in detail.

13.1 LEARNING OUTCOMES

After going through this unit, you will be able to:

- understand meaning and purposes of camera movements;
- describe the different types of camera movements;
- explain the uses for different camera movements; and
- discuss the some important rules related to camera movements.

13.2 WHAT IS CAMERA MOVEMENT ?

There are two types of movements in the recording of moving images. First is the movement of character/s and second, movement of the camera. Here, we shall discuss the movement of camera that is very crucial in film or video production. You can classify the shots into two following broad categories on the basis of the movement of the camera:

i) Static shot

ii) Dynamic shot

i) **Static shot:** If you don't move the camera during recording of a shot, it will be called a static shot. In static shots, the camera does not move, only characters can move. In this case the frame is fixed and the characters are moving in or out of the frame. We can understand it with an example.

Example : Imagine, there is a shot of an office room. The position of the camera is fixed and three people sitting in that room are talking about the new policy of the government. After a few seconds two more persons enter the room and join the discussion. After some time everyone except one goes out of the room. The person left in the room dials someone via the landline phone. In this example, the frame is fixed and the various characters are moving in that fixed frame. So, this is an example of a static shot.

ii) **Dynamic shot:** Dynamic shots are taken by the moving camera. If you move your camera during the recording of a shot, it will be classified as a dynamic shot. For example, two persons are talking to each other angrily in your shot, then the camera moves to left for showing the presence of few other people. It will be counted as a dynamic shot.

Camera movement refers to the movement of a camera while recording a shot. It is an important element of the visual language. It helps in storytelling and getting the involvement of the audience. Camera movements can also create or add emotions in a shot. The type of movement and the speed of movement both create some meanings. Camera movements are very important in filmmaking and you must know about the commonly used camera movements.

13.3 CAMERA MOVEMENTS : DIFFERENT TYPES

There are many different types of camera movements. They are used for various purposes. In this section, we shall discuss the different types of camera movements and their uses.

13.3.1 Pan

Pan is a horizontal movement in which you can move your camera from right to left or left to right. In panning, camera mount stays stationary. Panning gives an effect like looking from side to side while standing at one place. You can use pan to follow the movement of a character or to reveal the information about any place. Figure (1) displays the pan movement.

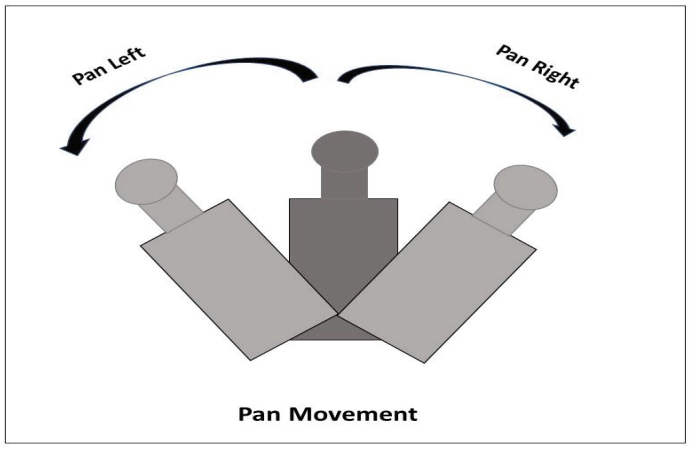


Figure 1 Pan Movement

Some important use of pan movement are as follows :

Follow a moving character/subject: We can use PAN movement to track a subject as they move horizontally across the frame. For example, in a chase scene, we can pan the camera to follow the running character as s/he move through the road.

Show a large scene: We can use this movement to show a large scene or landscape. For example, a camera can pan across a city skyline to establish the setting of a movie.

Reveal a hidden object or character: You can also use PAN movement to reveal a hidden object or character in the scene. For example, a camera can pan from a character's face to a hidden object s/he is looking at, creating suspense and tension.

Create a sense of disorientation: We can use PAN movement to create a sense of disorientation or chaos. For example, a camera can pan rapidly back and forth during a fight scene, creating a sense of confusion and excitement.

13.7.2 Tilt

Tilt is a vertical movement in which you can move your camera up or down. Like pan, camera mount stays stationary in tilting also. Tilting gives an effect like looking up or down while standing at one place. Tilt movement can be used to follow the upward or downward movements of your character. You can use this movement to reveal more information about your location. Figure (2) shows the tilt movement.

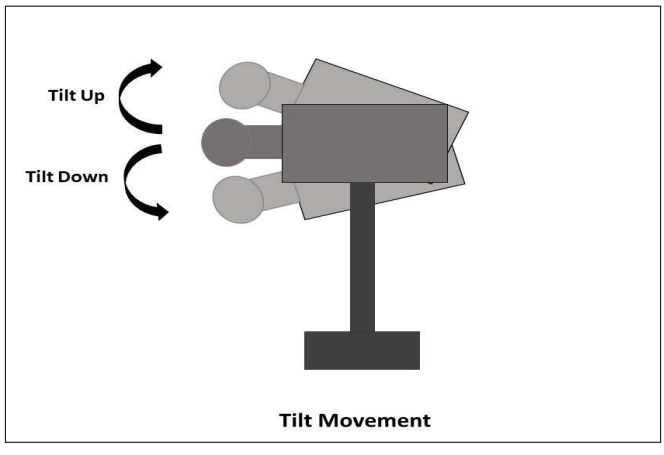


Figure 2 Tilt Movement

13.7.3 Dolly

Dolly or track is a movement of the camera towards or away from the subject. If you move the camera towards the subject, it will be called 'dolly in' or 'track in' whereas if the camera goes away from the subject, it will be called 'dolly out' or 'track out'. Wheeled camera mounts and tracks are used for this movement. This movement maintains the normal perspective. It gives the effect as you are moving towards or away from the subject. Figure (3) explains the dolly or track movement.

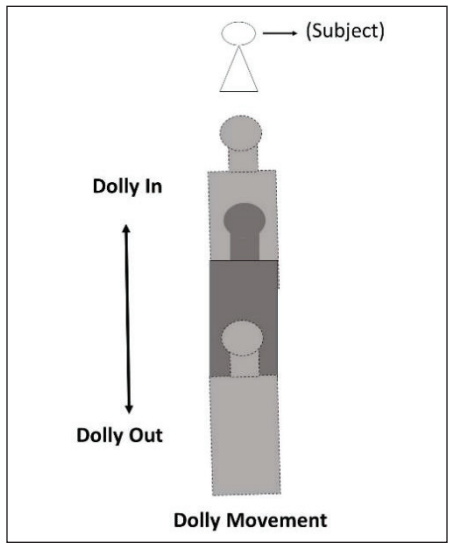


Figure (3) Dolly movement

Check your progress: 1

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. How is Pan different from Tilt ?

.....

.....

.....

2. Explain the terms – Dolly in and Dolly out.

.....

.....

.....

13.7.4 Other Camera Movements

Apart from these three basic camera movements, there are some other camera movements that are useful in film or video production. We shall now discuss them.

i. **Pedestal:** Pedestal is a type of camera mount generally used in studios. In pedestal up/down, the camera moves up and down without any change in its vertical or horizontal axis. You should not be confused between tilt and pedestal. In tilt, camera mount stays stationary, there is no change in the height of camera mount, only camera pivots up or down. But

in pedestal, the height of camera mount changes. In pedestal up, the camera moves upward as the height of the camera mount increases and vice versa in pedestal down. It is difficult to do this movement with general tripods. Figure (4) explains the pedestal movement.

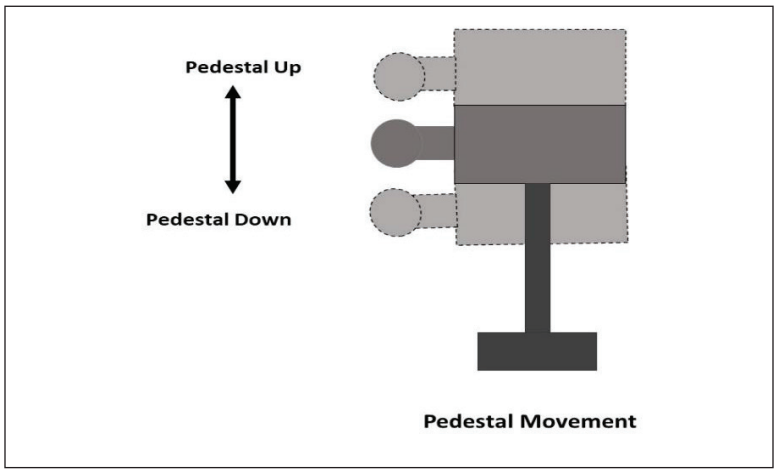


Figure 4 Pedestal Movement

ii. **Zoom:** Technically zoom is not a camera movement because it does not require any movement of the camera. Zooming changes the focal length of a zoom lens. While zooming in, you increase the focal length and as a result, the angle of view is narrowed. 'Zoom in' magnifies the subject and removes a few elements from the frame due to narrowed angle of view. On the other hand, in zooming out, the focal length is decreased and the angle of view is widened. As a result, 'zoom out' reduces the size of the subject and includes more elements into the frame located around the subject.

You should not be confused between dolly and zoom. 'Dolly in' gives an effect like you are coming towards the subject. It provides normal perspective shifts, but 'zoom in' just magnifies the subject. In 'dolly in' you feel the depth of space but 'zoom in' lacks it and looks artificial.

iii. **Dolly Zoom:** It is also called the Vertigo Effect because it was first used by the famous director Alfred Hitchcock in his 1958 film Vertigo. Dolly Zoom or Zolly is a combination of Dolly and Zoom in the opposite direction. This means, the dolly-in will be done with the zoom-out and the dolly-out will be paired with the zoom-in. But you have to do both movements simultaneously. For example, you can achieve this effect by dolly-in and zoom-out at the same time. You can use this technique creatively in your production.

iv. **Truck:** Like dolly, truck is also a camera movement performed with the help of wheeled camera mounts and tracks, but in trucking, you move the camera sideways. If you move the camera right, it is called 'truck right' or if you move the camera left, it is called 'truck left'. You should not be confused between 'pan' and 'truck'. In 'pan', camera mount (tripod or pedestal) stays stationary only camera moves right or left on its axis, but in trucking, the whole camera mount moves right or left along with the camera. For example, if you want to stay with your character who is moving straight, you can use the 'truck movement'. Figure (5) demonstrates the truck movement.

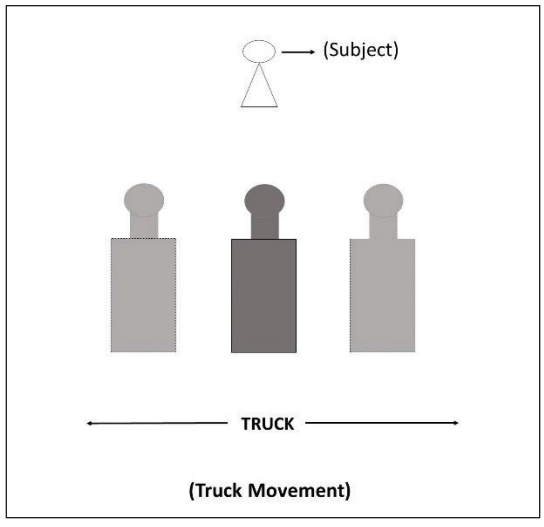


Figure 5 Truck Movement

v. **Arc:** When you truck your camera on a curved path, it is called arc. Arc movement can be arc right or arc left. In this movement, camera moves around the subject in a semicircle. You can use arc movement to reveal more information about your subject, to shoot a moving subject or to bring visual variety in your production. Figure (6) shows the arc movement.

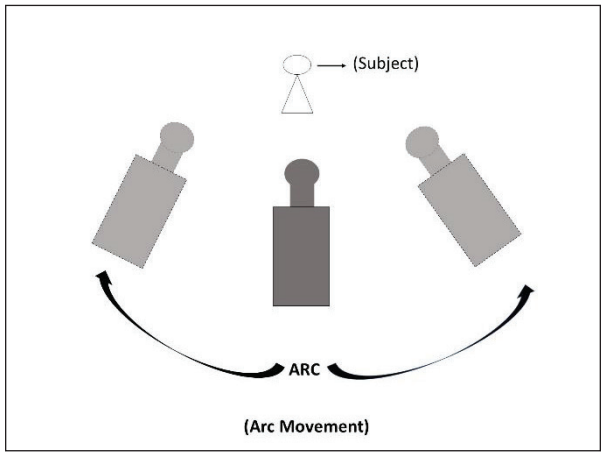


Figure 6 Arc movement

vi. **Crane movements:** In filmmaking or professional video production, cranes are frequently used. The crane is an equipment which has a long arm and the camera can be mounted on that. We can perform many movements with the help of crane. 'Crane up' and 'crane down' are used for the movement of crane arm upward and downward along with the camera whereas 'tongue left' and 'tongue right' are used for left and right movements of the crane arm. With the help of crane, we can do multiple camera movements. A camera mounted on a crane can be operated manually or with the help of remote control. Generally, the small cranes are called jibs.

You can use crane movements for various purposes. For example, you can shoot a subject from high angle and then come to eye-level in one shot with the help of crane movements. Cranes can help to take bird's eye-view and other high angle shots. With the help of crane, you can combine multiple movements and get the desired effects.

vii. **Handheld camera movements:** If the camera operator holds the camera in his/her hands during shooting, it is called handheld camera shoot. In handheld camera shoot, camera is not mounted on tripod or any other camera mounts. Handheld camera shoot provides greater freedom for different movements but at the cost of jerks and shakes. You can see the use of handheld cameras in news gathering because many times the camerapersons of news channels do not find enough time and space to fix their cameras on tripods. Documentaries also use the handheld camera shots.

Sometimes handheld camera is used purposefully to create certain effects. You can use shaky handheld camera shots to show nervousness, instability and anxiety. These shots can also be used for other creative purposes.

viii. **Movements with the help of camera stabilizers:** Camera stabilizers are equipment which enable the smooth and shake-free handheld camera movements. Variety of camera stabilizers are available from simple to complex ones. Steadicam is the leading brand. The camera operator can wear suitable stabilizer and mount the camera on it. Now s/he can move anywhere and on any type of surface. These camera stabilizers provide a great degree of freedom for different complex camera movements.

Suppose you are a camera operator and a camera mount is fitted on your body with a technology to minimize the shakes created by the human body, now you are free to move during shoot. Just think about the degree of freedom you can enjoy during shooting.

Check your progress: 2

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is Vertigo effect ?

.....

.....

.....

2. Discuss the use of handheld camera movements.

.....

.....

.....

3. Explain the Arc movement.

.....

.....

.....

4. Which of the following is not a camera movement ?

   a. Pan

   b. Tilt

   c. Tripod

   d. Dolly

5. Dolly and Zoom have the similar effects.

   a. True

   b. False

13.9 COMPOSITION RULES

We have already discussed several composition rules in a Unit on Picture Composition of this course. We discussed them in the context of still photography but as we know that moving images are also made up of still images (frames), so those rules apply here as well. Now we shall discuss some more rules which are useful in moving images.

i. **Do not cut on joints:** While composing shots, do not cut your characters on the joints (elbow, waist, knee, etc.). Direct cut on the waist or elbow or knee creates a jarring image. We should cut at a little higher or lower than the joints.

ii. **180 Degree Rule:** You can understand the 180 degree rule with the following diagram.

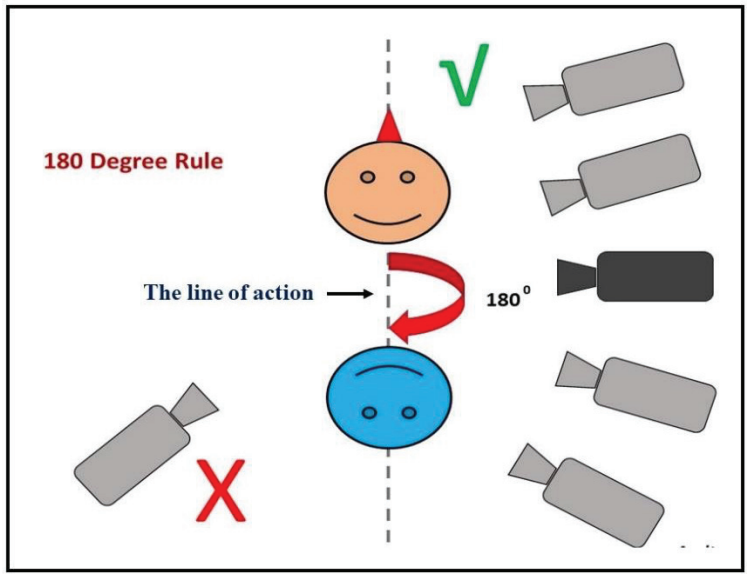


Figure (7) 180 Degree Rule

In this diagram, there are two characters interacting with each other. There is an imaginary line of action or axis of action. According to the 180-degree rule, while shooting this scene, we should not cross this imaginary line of action. We should keep our camera at only one side of the line of action otherwise positional (left-right) relationship of character will change and it will create confusion in the viewers mind.

Following diagram (Fig-8) shows the effect (reverse cut) of the violation of 180 degree rule that is crossing the straight imaginary line of action. It changes the right-left relationship of the characters which may cause confusion.

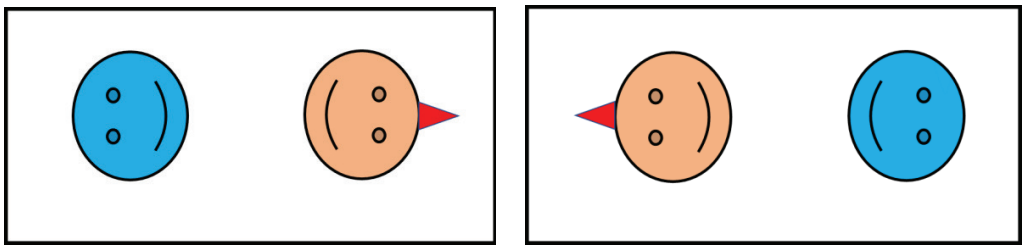


Figure (8)

Although the 180 degree rule should be followed in cinematography, this rule can be broken purposefully at times for the desired effects.

Activity 3
Use dolly in and zoom in to shoot the same subject. Compare both the clips and write down your observations.

Check your progress: 3

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. What is 180 degree rule.

……
……
……
……..

13.5 LET US SUM UP

In short, we can say that camera movement is an important component of visual language which helps in telling the story effectively. If you want to create quality audio-visual content, you must have a proper understanding of various camera movements and their uses. In this unit, we discussed various popularly used camera movements such as pan, tilt and dolly. Some other camera movements, such as pedestal, truck, arc, crane, and handheld, have also been talked about. The unit also includes a combination of dolly and zoom also known as zolly or Vertigo Effect. Finally we explained some compositional rules related to camera movement, for example - the 180 degree rule. This unit tried to provide detailed information about camera movements.

13.6 FURTHER READINGS

Belavadi, V. (2013). Video Production. Oxford University Press.

Macelli, J. V. (2005). Five C's of Cinematography: Motion Picture Filming Techniques.

Thompson, R., & Bowen, C. (2009). Grammar of the Shot. Taylor & Francis.

13.7 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check your progress: 1

1. Pan is a horizontal movement in which you can move your camera from right to left or left to right. In panning, camera mount stays stationary. Panning gives an effect like looking from side to side while standing at one place. On the other hand, Tilt is a vertical movement in which you can move your camera up or down. Like pan, camera mount stays stationary in tilting also. Tilting gives an effect like looking up or down while standing at one place.

2. Dolly in – Movement of the camera towards the subject is called 'dolly in'.

   Dolly out - If the camera goes away from the subject, it will be called 'dolly out'

   Wheeled camera mounts and tracks are used for these movements.

Check your progress: 2

1. Dolly Zoom or Zolly is called the Vertigo Effect because it was first used by the famous director Alfred Hitchcock in his 1958 film Vertigo. Dolly Zoom or Zolly is a combination of Dolly and Zoom in the opposite direction. This means, the dolly-in will be done with the zoom-out and the dolly-out will be paired with the zoom-in. But you have to do both movements simultaneously.

2. If the camera operator holds the camera in his/her hands during shooting, it is called handheld camera shoot. In handheld camera shoot, camera is not mounted on tripod or any other camera mounts. Handheld camera shoot provides greater freedom for different movements but at the cost of jerks and shakes. You can see the use of handheld cameras in news gathering because many times the camerapersons of news channels do not find enough time and space to fix their cameras on tripods. Documentaries also use the handheld camera shots. Sometimes handheld camera is used purposefully to create certain effects. You can use shaky handheld camera shots to show nervousness, instability and anxiety. These shots can also be used for other creative purposes.

3. When you truck your camera on a curved path, it is called arc. Arc movement can be arc right or arc left. In this movement, camera moves around the subject in a semicircle. You can use arc movement to reveal more information about your subject, to shoot a moving subject or to bring visual variety in your production.

4. c. Tripod

5. b. False

Check your progress: 3

1. According to the 180-degree rule, while shooting this scene, we should not cross this imaginary line of action. We should keep our camera at only one side of the line of action otherwise positional (left-right) relationship of character will change and it will create confusion in the viewers mind.

UNIT 14 VIDEO RECORDING TECHNIQUES

Structure

14.0 Introduction

14.1 Learning Outcomes

14.2 Camera and Types of Production

14.2.1 Single-camera Production

14.2.2 Multi-camera Production

14.2.3 Other Types

14.3 Video Recording in Different Situations and Useful Tips

14.4 Let Us Sum Up

14.5 Further Readings

14.6 Check Your Progress: Possible Answers

14.0 INTRODUCTION

In the previous units we discussed various aspects of video or television production. We talked about the structure and functioning of video cameras, lighting techniques, different shot sizes, camera angles, and camera movements. These topics cover most aspects of video recording. In this unit we are going to discuss some more video recording techniques. Single-camera production, multi-camera production, ENG and EFP will be discussed in this unit. All these production types differ mainly because of the camera and that is why we have included them in this chapter. We shall also discuss some important tips useful in video recording.

14.1 LEARNING OUTCOMES

After going through this unit, you will be able to :

- understand the difference between single-camera production and multi-camera production;
- describe the ENG and EFP; and
- enhance your video recording skills.

14.2 CAMERA AND TYPES OF PRODUCTION

Audio-visual productions can be classified on various grounds. We can classify them on the basis of the number of cameras involved in shooting, location of shooting, production objectives, etc. In this section we shall discuss different types of production. Firstly, if we consider the number of cameras used for production as the basis, we can divide audio-visual production into two categories - single-camera production and multi-camera production.

14.2.1 Single-camera Production

As the name suggests, this type of production uses only one camera. All shots and angles are recorded with a single camera. Single-camera shooting is popular

in feature films, short films, documentary films, news gathering, etc. Now we shall discuss some advantages and disadvantages of single-camera production.

Advantages: Single-camera production has the following major advantages:

i. Single-camera gives you more control over each shot. You can set the light and microphone according to the requirement of each shot.

ii. It requires just one camera and camera crew.

iii. If you are shooting in a small space, the single-camera gives the flexibility to properly set the lights and sound for each shot. The lighting and sound equipment should be positioned in such a way that they play their role properly without coming into the frame.

iv. It provides flexibility to the actors/actresses. Their presence on the set is not required at the same time.

Disadvantages: The disadvantages of single-camera production are as follows:

i. A lot of repetition: For an effective and engaging production, it is necessary to shoot a shot from more than one angle. In single-camera production, you shoot the same shot from different angles with the same camera, so you have to repeat that shot multiple times. For example, if you are shooting a dialogue scene of two characters, you shoot it from at least three different angles. Therefore, to shoot all the three angles, the characters will have to repeat the same shot three times.

ii. It takes more time in shooting.

iii. Single-camera production requires more editing time.

14.2.2 Multi-camera Production

Multi-camera production involves more than one camera. Here we use multiple cameras to shoot the same action from different angles or various activities happening at the same time which are relevant to that particular show. For example, if you are shooting a studio interview, you can use three cameras. Camera-1 frames a master shot that will be a long shot covering both the interviewer and the guest sitting on the couch. Camera-2 frames medium close-up of the interviewer and camera-3 takes medium close-up of the guest. These three cameras will be connected to a video switcher or vision mixer. Here, in this case we are using three cameras to shoot one activity i.e. interview. Now just imagine that you are recording this interview with live audience and you use two more cameras to capture audience's reactions and activities. In this case, you are using five cameras to capture two activities - interview and the audience's activities. The second activity is also relevant to this programme.

Multi-camera production can be used for both live and non-live programmes. This can be a studio based production or field production. Multi-camera shoots are popularly used in sports broadcasts, recording events, television interviews, panel discussions, reality shows and so on.

In multi-camera shoots, the video switcher or vision mixer plays an important role. All cameras used in multi-camera production are connected to this device. Each camera has a dedicated monitor where you can see the shot composed by that particular camera. So, if you are using five cameras, you will have five monitors to view the shots framed by those five cameras. The vision mixer

allows you to select any camera that will go on air in case of live broadcasting or for final recording in the case of non-live programme. The producer/director sits with the technical director or switcher operator and instructs him/her to select the shots. You will hear the director's/producer's commands such as - 'ready camera-3', 'take the camera-3', etc. The first command tells that some other camera is on air and director/producer now wants to make camera-3 on air. So, the first command is 'ready camera-3'. Technical director will follow the command and keep the camera – 3 ready. Now camera-3's output will be visible in preview monitor. After that director/producer gives the next command, 'take the camera-3' and technical director follows it. Camera-3 will be on air and its output will be seen in the program monitor. You can also add transitions and some other visual effects with the help of video switcher/vision mixer. Director/ producer can instruct the camera operators also with commands like, 'camera -2 give me a close-up of interviewer', 'camera-1 give me a two shot of interviewer and guest', etc. Now we shall discuss some advantages and disadvantages of multi-camera production.

Advantages : The major advantages of multi-camera production are following:

i. Multi-camera production takes comparatively less time to shoot as an action can be shot from different angles at the same time.

ii. Since a lot of editing (shot selection, sequencing, adding transitions, etc.) have been done at the time of shooting itself, multi-camera production requires comparatively less time for post-production.

iii. A live event cannot be properly recorded with a single camera. If you use a single camera, you will miss many important shots. So, in case of live events, multi-camera shoot is the best option.

Disadvantages : Some key disadvantages of multi-camera production are as follows:

i. It requires more cameras, other equipment and more production crew.

ii. You should be more careful to place lights and microphones so that they do not come into the frames of all the cameras positioned at different places.

iii. You have to use large light sources to do flat lighting so that the entire action area is properly illuminated. Flat lighting is comparatively less interesting.

Many programmes use both single-camera and multi-camera shoots. You can take an example of a panel discussion on television news channel. Many discussions begin with news packages that establish the topic of discussion. In this case, the news package is shot with a single camera, but the rest of the panel discussion is recorded with a multi-camera setup.

14.2.3 Other Types

As we have discussed earlier, audio-visual productions can be classified on different grounds. Here we shall discuss some other types of productions.

ENG: ENG stands for Electronic News Gathering. The objective here is to gather news content for a television news channel using various electronic devices. In electronic news gathering, we use camcorders, microphones, basic

lights and a team of two or three people. Nowadays one-man teams are also used for news gathering where the reporter handles everything including camera. Smartphones and selfie sticks are used to gather news content for TV channels. But sometimes the channels also use larger crew, multi-camera setup and OB vans.

Normally, electronic news gathering is not a well-planned activity as you need to get ready for the shoot very quickly. For example, a TV news channel gets information about any newsworthy incident. Now it is required to send an ENG team to the spot as fast as possible. We all know about the race between news channels to show the story first. So, you can easily understand that ENG team has very less time to plan. In electronic news gathering, the main objective is to provide the news content as early as possible to the channel, so creativity and production aesthetics are on the lower priority. Speed is the key element in electronic news gathering.

EFP: Electronic field production (EFP) is a term that is used mainly in the television industry. When we shoot outside the television studio, it is called electronic field production. Unlike ENG, EFP is a well-planned production type. Here we have time to plan every aspect of the production. EFP combines mobility of ENG and quality of studio production. In electronic field production, we can use multi-camera setups and larger production crew. Shooting sports events, award shows, big conferences, mega cultural, religious or business events, etc. are examples of EFP.

Check your progress: 1

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. How is a multi-camera production different from a single-camera production ?

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.....

.....

2. What is vision mixer? Briefly discuss its use.

.....

.....

.....

3. In a single-camera shoot, generally the actors have to repeat the actions.

   a. True

   b. False

4. Live broadcast of a sports event is an example of multi-camera production.

   a. True

   b. False

5. Panel discussions in television news channels are examples of _____ production.

   a. Single-camera

   b. Multi-camera

   c. None of the above

14.3 VIDEO RECORDING IN DIFFERENT SITUATIONS AND USEFUL TIPS

There is a wide range of video recording and it is done by different types of cameras. A team making programs for television channels or well-known online platforms also record video footage with professional cameras, on the other hand a common man records video at a family function or for his/her personal social media account. So, if you look at the field of video recording, it ranges from the professional cameraman to the common man. You can find many popular vloggers who use smartphones for video recording and have millions of viewers. So, here we shall discuss how different aspects of video recording are handled differently in different situations.

Content

Here, we shall discuss some content related aspects.

- You should always go for thoughtful recording. When you press the recording button, the purpose and composition should be clear in your mind. You know that recording is a production phase activity and is the result of a lot of planning in the pre-production phase. In case of news, we are always in a hurry but still the objective and what we want to achieve should be clear to us.
- In fiction, we follow the script at the recording stage and all components of the composition (characters, background, lighting, etc.) are under our control. The characters follow our instructions, we have enough time to plan the background and props, and we have the freedom to modify them. There is plenty of time and lighting equipment available to achieve proper lighting. We have the freedom to retake. But the cases of news and documentaries are totally different. Here we deal with real events which are not in our control. For example: If you are covering the Prime Minister's rally or function, the activities of the Prime Minister are not under your control; If you are shooting a wild life documentary on lions, the actions of the lions or lioness are not under your control. You have very limited freedom with regards to lighting and backgrounds.
- Video recording of fiction takes more time and planning; hence, the cameraperson can concentrate more on the aesthetic aspects whereas in news this work is mostly done in a hurry, hence more focus is on the event only. Aesthetic aspects can be compromised.
- In fiction there is a whole team for video recording but for news the situation is completely different. Here, there is a very small team of reporter and cameraperson and now for many media houses only reporter is doing all the work. S/he works as both reporter and cameraperson. Smartphones are used to record news footage even in national television channels.

- The type of content - live or recorded - also affects the video recording process. Live recording is comparatively difficult as it gives no chance for mistakes and corrections. In live video, both the production and post-production phases go on simultaneously. Live editing (switching) plays an important role in this situation.
- Shoot extra footage: It is always a good idea to shoot more footage than you think you will need. This gives you more options during the editing process and ensures that you have enough footage to tell your story effectively.
- Don't forget to record shots for cut-ins and cutaways.

Sets and Locations

- Everything that comes into the frame plays an important role in conveying the desired meaning. The place where the characters are playing their role is important. Selecting the appropriate set or location is important. Before pressing the recording button in your camera, you must think whether the background and the surrounding environment coming in your frame is suitable or not.
- You can record on set or choose a location; You can record indoor or choose outdoor but the selection should be thoughtful. Requirement of story/content, feasibility and budget play important role in this decision.
- Various types of sets are available. If your budget and time permits, you can go for the real sets. These sets are recreations of actual places and require a lot of money. Abstract sets are cheaper options. They give a rough idea of the actual place. Sometimes cameo lighting (the light is only on the character and the background is completely dark) can also be used as a cost-effective alternative.
- Location plays very important role in news too. For example, if you are recording news related to AIIMS, Delhi, then at the end of the story, PTC should be recorded at such a place that it can be established that the reporter is filing the story from AIIMS, Delhi. This is just an example. In all types of programs, the selection of location is important.
- Modern technology has given us another option - the virtual set. You can record your video with green or blue screen and the desired background or set can be inserted with the help of post-production techniques like chroma keying. Virtual sets are used in both fiction and news.

Camera Handling

- Stable and smooth shots are key requirement for a quality video program. The camera should not shake while recording otherwise you will get shaky footage which can spoil your video. Monopods, tripods, and other camera stabilizers should be used. Sometimes shaky footage can be used for some aesthetic purpose.
- We must take care that our camera movements (pan, tilt, dolly etc.) are smooth. When panning or tilting jerks should be avoided. Don't forget to level the head of your tripod.
- In news gathering, many times we have to record video in a crowded place. Sometimes recording has to be done even in agitations and

protests. And many times video may have to be recorded even in the midst of lathi charge and firing. Apart from this, many times videos have to be recorded in natural calamities like floods, landslides, storms, earthquakes. In these situations, special care should be taken for your safety and the safety of the equipment. Along with taking care of these things, you should also try to record good and useful footage.

Composition

- It is very important to take care of composition in video recording. You should properly include those things in your frame which can effectively convey your message to the people.
- In video recording in the field of news, the content is more important than the aesthetic aspect. Since real events are being recorded here, you cannot control the people being recorded. You should try to give the best composition according to their movements.
- Even in news, there are situations where you have little control as the camera person. Like recording interviews, recording studio based programmes, special shows, docudramas, etc. In these circumstances, better shots can be framed by following the rules of composition.
- The general rules of composition should be followed when recording a video.
- Be sure to take care of sufficient lead room and headroom.
- The use of Rule of Thirds is useful in placing your main subject. This is a common rule in video recording that suggests dividing the frame into thirds both horizontally and vertically, creating nine equal sections. The important elements in the shot should then be placed at the points where these lines intersect.
- Do not cut at the natural divisions of the body while framing the shot. Like - waist, knee etc. Take a part slightly above or below it.
- Shot sizes are important tools in video recording and can convey a lot of information and emotions to the viewers. Choosing the right shot size is crucial in creating an effective visual narrative. So, use different shot sizes with the right purpose. Different shot sizes should be used for the following purposes:

i. Extreme long shot (ELS) - This shot size shows the subject from a distance, giving the viewer an overall view of the setting. This shot is used to establish the location or environment.

ii. Long shot (LS) - Also known as a full shot, this shot shows the subject from head to toe and some of the surrounding environment. This shot is used to establish the subject's location and show their body language.

iii. Medium shot (MS) - This shot shows the subject from the waist up, and is often used for dialogue scenes or to show the subject's actions in relation to their environment.

iv. Close-up (CU) - This shot shows the subject's face, and is often used for emotional or dramatic impact.

v. Extreme close-up (ECU) - This shot shows a small portion of the subject's face, often just the eyes or mouth. It is used to emphasize emotion or detail.

- Movement within the shot can add interest and excitement. This can be achieved through camera movement, such as panning or tracking, or through movement of the subject within the shot.
- Don’t forget to record reaction shots. A reaction shot is a shot that shows a character's response to something happening in the scene, often shown immediately after the action or dialogue that triggers the reaction. Reaction shots are an important tool in video production that can be used to convey emotion, establish relationships between characters, and create a more engaging viewing experience for the audience.

Lighting

Lighting is a vital aspect of video recording. It can have a significant impact on the quality and mood of the footage. Here are some lighting-related tips to keep in mind when recording video:

- Use natural light whenever possible: Natural light is often the most flattering and versatile type of lighting for video. Try to use windows or other sources of natural light to illuminate your subject as much as possible.
- Avoid harsh shadows: Harsh shadows can be distracting and unflattering, so try to diffuse the light using a soft box, umbrella, or other diffusion tool. This can help create a more even and flattering lighting pattern.
- Consider the background: The lighting on the background can be just as important as the lighting on the subject. Make sure the background is well-lit and properly exposed to create a sense of depth and context.
- Use three-point lighting: Three-point lighting involves using a key light to illuminate the subject, a fill light to fill in any shadows, and a backlight to separate the subject from the background. This can help create a more professional and polished look.
- Match the colour temperature: Different light sources can have different colour temperatures, which can affect the colour of your footage. Try to use lighting sources that have a similar colour temperature, or use colour correction tools to adjust the colour temperature in post-production.
- Use lighting to create mood: Lighting can be used to create different moods and emotions in your footage. For example, warm, orange-toned lighting can create a cosy, intimate mood, while cool, blue-toned lighting can create a more dramatic and moody feel.

Audio

- Record high-quality audio. High-quality audio is just as important as high-quality video. Use a dedicated microphone or a lavalier mic to capture clear and consistent audio.
- Monitor your audio levels. Keep an eye on your audio levels throughout the recording process to ensure that your audio is not too loud or too quiet.

Check your progress: 2

Note: Use the space given below for your answers.

Compare your answers with those given at the end of this Unit.

1. Write any three composition related precautions one should take while recording video.

.....

.....

.....

2. Why is lighting important in video recording ?

.....

.....

.....

3. We should avoid harsh shadows.
   a. True
   b. False
4. Long shot should be used to show the emotion.
   a. True
   b. False
5. Rule of Thirds is related to _____.
   a. Lighting
   b. Composition
   c. Audio

14.4 LET US SUM UP

The camera is the core in video or television production. In this unit we discussed different types of video or TV production based on the number of cameras involved. We saw how single camera production differs from multi camera. We also talked about electronic news gathering and electronic field production. As a student of mass communication and especially electronic media, you should have an in-depth understanding of video recording tools and techniques. A lot of video recording these days is done by both professionals and common men. The internet has removed the limitations of platforms and a huge amount of video content is coming from the masses. Social media has provided huge opportunities to the hidden talents. Keeping this in mind, we have also discussed some important tips for recording videos using different types of recording equipment.

14.5 FURTHER READINGS

Belavadi, V. (2013). Video Production. Oxford University Press.

Macelli, J. V. (2005). Five C's of Cinematography: Motion Picture Filming Techniques.

Thompson, R., & Bowen, C. (2009). Grammar of the Shot. Taylor & Francis.

14.6 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Check your progress: 1

1. Multi-camera production involves more than one camera. Here we use multiple cameras to shoot the same action from different angles or various activities happening at the same time which are relevant to that particular show. On the other hand, single-camera production uses only one camera. All shots and angles are recorded with the same camera.

2. Vision mixer or video switcher is a device which plays an important role in multi-camera production. All cameras used in multi-camera production are connected to this device. Each camera has a dedicated monitor where you can see the shot composed by that particular camera. So, if you are using five cameras, you will have five monitors to view the shots framed by those five cameras. The vision mixer allows you to select any camera that will go on air in case of live broadcasting or for final recording in the case of non-live programme. You can also add transitions and some other visual effects with the help of video switcher/vision mixer.

3. a. True

4. b. True

5. b. Multi-camera

Check your progress: 2

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3. a. True

4. b. False

5. b. Composition