Photojournalism

WEEK THREE: Digital photography exposure

Learning Outcomes

At the end of this week, you should be able to:

1. Learn the operational parts of DSLR and Mirrorless cameras
2. Explore the lens focal systems and exposure in photography.
3. Analyze how exposure works in photography

Introduction

This lecture introduces you to exposure, which is the total density of light allowed to fall on the photographic medium (photographic film or image sensor) during the process of taking a photograph. Exposure setting in a camera's parts such as the ISO, the aperture and the shutter speed aims to produce an appropriate looking picture. Operational parts of a mirrorless and digital Single-lens reflex (DSLR) camera will be explored as well. This topic will also focus on the lens as a part of exposure process in photography.

The operational parts of DSLR and Mirrorless cameras

Parts of the Camera

There are many parts of the camera, all of them have a use, and different types of cameras with different items, however there are common parts, though this topic will focus more on digital cameras and not film or analogue camera. On page two the camera parts of a digital camera have been illustrated, the source of this information is from https://sites.google.com/a/psdschools.org/lcbeginning-photography/parts-of-the-camera. DSLR captures the image digitally, on a memory card and the images can be erased that is the card can be reused for a new set of pictures.

Source: Google Sites, *Parts of the Camera*
https://sites.google.com/a/psdschools.org/lcbeginning-photography/parts-of-the-camera

Lens draws light into the camera.
Shutter opens and closes to control the length that light gets into the camera. A leaf shutter is located behind the lens elements, and a focal pane shutter is located in front of the film pane.
Shutter Release releases the shutter mechanism.
Aperture contracts to control the diameter of the hole that lets light pass through. It is controlled by the f-stop ring.
Viewfinder gets looked through to frame your picture.
Camera Body holds all of the big and small parts of the camera.
Flash Shoe when the flash cube gets attached.
Self-Timer stalls the shutter, usually seven to ten seconds, to get everyone in the picture.
Shutter Speed Control controls the length that the shutter stays open. This is usually measured

in fractions of a second.
Main Dial Control has the ability to control what the camera is used for. (Picture, Video, etc.)
Memory Card Slot opens and closes to allow you to put in and take out the memory card.
Flash Button allows you to change if the flash is on or off.
Play Button allows to play a video.
Erase Button allows you to erase an item.
Power Switch turns the camera off and on.
Lens Focus Mode Switch allows you to focus the camera.
LCD Display displays what you took a picture of.
Cross Keys allow to to move back and forth between pictures and videos.

Source: *Parts of the Camera* https://sites.google.com/a/psdschools.org/lcbeginning-photography/parts-of-the-camera

DSLR Parts and their Functions

According to Ranjan (2017), whether you have a Digital SLRs or point and shoot, these camera parts will inevitably be found on most cameras. He further states that proper understanding of the names and functions is the primary step towards improving your photography skills. Below are the **Basic Parts of DSLR Camera and Their Functions :**

1. LENS

Source: Monoar_CGI_Artist, *Lens,* https://pixabay.com/photos/camera-lense-photography-zoom-1272791/ Free for use under the Pixabay Content License

The lens is one of the most vital parts of a camera. The light enters through the lens, and this is where the photo process begins. Lenses can be either fixed permanently to the body or interchangeable. They can also vary in focal length, aperture, and other details (Ranjan, 2017).

2. VIEWFINDER

The viewfinder is the area on the camera that you look through in order to compose your shot. For some cameras, an LCD screen is used as a viewfinder, or your camera may have the option

to use either one. Once your photo is taken, it may not look exactly like what you see through the viewfinder. Factors such as lighting, lens, camera settings and your camera's capabilities will affect the finished result. Because of this, the viewfinder is not intended as a preview of your photo, but rather a tool to aid you in taking it. You, as the photographer, determine the final result (Ranjan, 2017).

3. MODE DIAL

Source: PublicDomainPictures, *Mode Dial*, https://pixabay.com/photos/aperture-camera-circle-dial-15613/ Free for use under the Pixabay Content License

Most cameras today have a variety of functions and automatic features. The mode dial allows you to select different options, such as automatic mode, program mode, sport mode or macro mode. Older cameras may not have a mode dial, because all of the settings are manual. There are also some compact cameras that use a touch-screen for selecting options instead of a dial (Ranjan, 2017).

4. BODY

The body is the main portion of the camera, and bodies can be a number of different shapes and sizes. DSLRs tend to be larger bodied and a bit heavier, while there are other consumer cameras that are a conveniently smaller size and even able to fit into a pocket (Ranjan, 2017).

5. SHUTTER RELEASE

Every camera comes equipped with a shutter release button. This is simply the button on the camera that is used to snap the picture. It opens and closes the shutter, allowing the necessary light and information to enter the camera. The amount of time the shutter stays open depends on what you have your shutter speed set to. The length of time the shutter is left open or "exposed" is determined by the shutter speed (Ranjan, 2017).

Close up shutter release button on professional DSLR camera

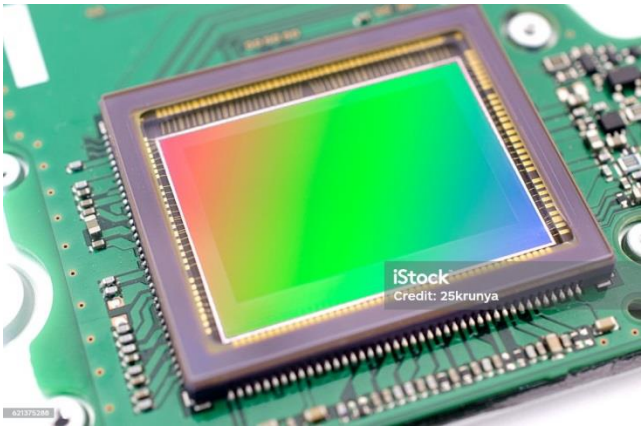
Source: Pixabay, *Shutter release button*, https://pixabay.com/photos/camera-shutter-digital-camera-dslr-7257967/ Free for use under the Pixabay Content License

6. APERTURE

Source: Skitterphoto, *Aperture*, https://www.pexels.com/photo/close-up-of-camera-313559/ Free to use (CC0), Pexel.com.

The aperture affects the image's exposure by changing the diameter of the lens opening, which controls the amount of light reaching the image sensor. Some digital compacts will have a fixed aperture lens, but most of today's compact cameras have at least a small aperture range. This range will be expressed in f/stops. For DSLRs, the lens will vary on f/stop limits, but it is usually easily defined by reading the side of the lens. There will be a set of numbers stating the f/stop or f/stop range, ex: f/2.8 or f/3.5-5.6. This will be your lowest settings available with that lens (Ranjan, 2017).

7. IMAGE SENSOR



Source: 25krunya (2016) *The digital image sensor of Dslr camera stock photo.* https://www.istockphoto.com/photo/the-digital-image-sensor-of-dslr-camera-gm621375288-108501811?utm_source=pixabay&utm_medium=affiliate&utm_campaign=SRP_photo_sponsored&utm_content=https%3A%2F%2Fpixabay.com%2Fphotos%2Fsearch%2Fcamera%2520image%2520sensor%2F&utm_term=camera+image+sensor. Istock by Getty images.

The image sensor converts the optical image to an electronic signal, which is then sent to your memory card. There are two main types of image sensors that are used in most digital cameras: CMOS and CCD. Both forms of the sensor accomplish the same task, but each has a different method of performance (Ranjan, 2017).

8. LCD SCREEN

Source: Karolina Grabowska, *LCD screen*, https://www.pexels.com/photo/photo-camera-recording-vlog-in-modern-workspace-4491445/ Pexel.com, Free to use.

The LCD screen is found on the back of the body and can vary in size. On digital compact cameras, the LCD has typically begun to replace the viewfinder completely. On DSLRs, the LCD is mainly for viewing photos after shooting, but some cameras do have a "live mode" as well (Ranjan, 2017).

9. FLASH

Source: Tantray Junaid, Camera flash, https://www.pexels.com/photo/vintage-camera-on-grass-9392175/ Pexel.com, Free to use.

The on-board flash will be available on all cameras except some professional grade DSLRs. It can sometimes be useful to provide a bit of extra light during dim, low light situations (Ranjan, 2017).

10. FOCUS RING

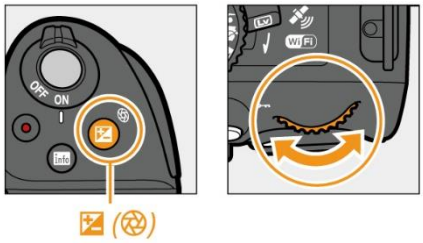
Source: Markus Spiske, *Focus Ring*, https://www.pexels.com/photo/camera-metal-photography-vintage-2027044/ Pexel.com, Free to use.

Film or digital SLR cameras will most likely have a focus ring. This is a ring typically found on the lens that allows manual control of the camera's focus. You can decide if you want the whole image in focus, or just a part of it. Many cameras have an auto-focus feature in addition to the focus ring. Other cameras, such as point-and-shoot cameras, will not have a focus ring at all, as all of the focus is set automatically (Ranjan, 2017).

11. VIDEO START-STOP BUTTON

Don't press the red button! Unless you want to shoot video, that is. This button may show up in a different position on your camera, but it is likely still decorated with a red dot. Some cameras forgo a separate record button and instead use the regular shutter button, along with a movie mode on the mode dial, for shooting videos (Ranjan, 2017).

12. EXPOSURE COMPENSATION BUTTON



Source: Ranjan, R. (2017). *EXPOSURE COMPENSATION BUTTON* http://www.pixelrajeev.com/wp-content/uploads/2017/08/d5300_exposurecomp-01.jpg. Theme Mero Blog by Kantipur Themes

JONATHAN PAGAOA Camera body https://www.pexels.com/photo/photo-of-a-body-camera-14997916/ Pexel.com, Free to use.

If you want to control aperture, you need to hold down this button. If not in manual mode, this button allows you to adjust exposure compensation — that is, make the image brighter or darker while still letting the camera make its own decisions about which settings to use to achieve that. (Ranjan, 2017).

13. MODE DIAL

This sets the camera to your desired shooting mode. The standard modes are Program, Shutter Priority, Aperture Priority, and Manual (denoted by the P, S, A, and M positions on the dial). (Ranjan, 2017).

14. FLASH BUTTON

In any of the "advanced" exposure modes (P, S, A, or M), this button will trigger the pop-up flash. Its location may vary from camera to camera, but the "lightning bolt" symbol is universal, so you'll always be able to find it. The icon next to it is the flash symbol, plus the exposure compensation symbol (Ranjan, 2017).

15. LENS RETRACT BUTTON

Retractable lenses are becoming increasingly popular as they are more compact than non-retractable models. You must press this button to initially "zoom" the lens into its operational position, and again to retract it when you're done shooting (Ranjan, 2017).

16. LENS RELEASE BUTTON

Press this button to unlock the lens mount and detach the lens by rotating it. You don't need to press it when mounting a lens (Ranjan, 2017).

17. AUTOFOCUS-AUTOEXPOSURE LOCK (AE/AF LOCK)

When using autofocus and auto exposure, holding this button down will lock those settings, even if you move the camera. This isn't often used by beginners, but it is beneficial for more advanced shooters who can use it to take several shots with different framings while ensuring all remain focused on the same point and exposed identically (Ranjan, 2017).

18. I BUTTON

Nikon really does call this the "i" button — probably because it already has an "info" button on its cameras. Many other brands have a similar button, usually denoted by a "Q," for "quick menu." Pressing this button brings up a set of functions on the camera's LCD screen, which can be controlled directly. This can be useful for adjusting ISO, white balance, and drive mode settings on cameras that don't have dedicated buttons or dials for said features (Ranjan, 2017).

19. MAGNIFY BUTTON

We took the liberty of labeling this as "magnify" rather than "zoom" in order to avoid confusion, as this button has nothing to do with zooming the lens. This is for magnifying an image during playback, allowing you to see greater detail (Ranjan, 2017).

20. DEMAGNIFY BUTTON

Again, we're not calling this "zoom out." This is the opposite of the aforementioned magnify button, but will also let you expand the playback view to show multiple image thumbnails at once. Some cameras will even let you pull back into folder or calendar views (Ranjan, 2017).

Other Parts of a Camera

Here are other camera parts not mentioned by Rajan (2017), but have been analyzed by Diprose (2023), and these include:

Pentaprism

The pentaprism is a mirror placed at a 45-degree angle behind the camera lens. The mirror projects the light captured from the lens to the viewfinder. Before pentaprisms, photographers always had to look downwards when taking photos. This is not ideal for some subjects and would only allow you to take photos at hip-level. Pentaprisms got rid of this problem and now defines single-lens reflex or SLR cameras.

Focusing Screen

A camera's focusing screen is the glass surface on which the camera's mirror projects the image. The focusing screen helps in achieving various focus effects such as sharp and high-contrast shots to blurs and bokeh.

Condenser Lens

A condenser lens has two matching convex lenses. This part uses a simple method for correcting color fringing or aberration that is a common problem encountered when using traditional camera lenses.

Grip

The grip is the right side of a camera, which has a special curved design to allow you to comfortably handhold the camera. It usually provides space to place your fingers and securely hold the camera. The grip usually has a different texture than the rest of the camera.

Display

The camera display shows the user helpful information about the photos and the camera. Here you will see the different camera settings you can tweak to alter your exposure, ISO, shutter speed, and more. You can also access other menus using this display to change the settings on your camera. Most camera displays nowadays let you see how your image will appear before you press the shutter release button. This feature revolutionized digital cameras as it helps photographers in creating consistent shots.

Electronics

Your camera's electronic components are divided into three separate categories: photo capture components, camera controller, and user interface components. The controller elements control all the electronic components of the camera. Its photo capture elements are responsible for the recording of images. Meanwhile, the user interface elements are responsible for letting the user interact with and control the camera.

Remote Control Sensor

A remote control sensor is an electronic device (usually an infrared device) that allows you to connect the camera to remote controls. Once you make the connection, you can use the remote control to trigger the shutter from a distance or at a predetermined moment.

Main Dial

The main dial is a cogwheel situated on the front part of the camera that allows you to adjust aperture, shutter speed, exposure compensation, and other parameters. On some cameras, the main dial can help you navigate through the images on the memory card.

Hot Shoe

The hot shoe, a U-shaped metal bracket situated on top of the camera, is among the basic parts of a camera. It is a mechanical fitting that allows you to connect an external flash unit and other accessories such as radio triggers, external microphones, and light meters.

Contacts

The contacts are small metal pins on the back of the lens, aligning with the camera body once the lens is mounted. They facilitate communication between the lens and the camera, conveying automatic information such as aperture, focal length, and focus adjustments.

Processing Engine

The processing engine, also known as an image processor, turns the raw data captured by the camera's sensor into a viewable image. This includes tasks like noise reduction and color correction.

Buffer

The buffer in a camera is temporary storage used when taking multiple photos quickly, such as in burst mode. Images are stored in the buffer before being written to the memory card. The size and speed of the buffer can affect the number of images that can be captured in quick succession.

Function Buttons

Function buttons, often labeled as "Fn" on cameras, are customizable buttons that can be programmed to perform specific tasks for quicker access. This can include adjusting ISO, white balance, autofocus mode, and more. The number and placement of these buttons vary among camera models and manufacturers.

ISO

ISO refers to the camera sensor's sensitivity to light. Higher ISO values increase sensitivity, improving low-light performance and increasing image noise. Conversely, lower ISO values provide cleaner images but require more light.

Red-eye Reduction

Red-eye reduction is a feature found in many cameras that helps minimize the appearance of red eyes in portraits caused by the camera flash reflecting off the subject's retinas. Typically, this involves emitting a pre-flash to constrict the subject's pupils before the main flash and exposure.

Main Dial

The main dial is located on the top or back of the camera. It allows you to quickly adjust settings like aperture, shutter speed, and ISO without needing to dive into menus, aiding in shooting efficiency and speed. Here, you will also find automatic preset modes such as "Portrait," "Landscape," and "Night."

Communication Ports

Communication ports are the various inputs and outputs found on the camera. These may include a Micro USB port for transferring photos to a computer, a micro or full-size HDMI port for external monitors, and a mini microphone jack for recording higher-quality audio using an external mic.

Memory Card Slot

The memory card slot is where the camera's memory card is inserted. The memory card stores all the photographs taken by the camera. Some cameras have multiple card slots, such as SDXC and CFexpress, allowing for greater storage capacity or backup of photos.

Tripod Mount

The tripod mount is a 1/4-inch threaded hole at the bottom of the camera that allows it to be attached to a tripod, tripod head, or monopod. Using a tripod can provide a stable platform for the camera, improving image sharpness and facilitating longer exposures.

Zoom Elements

If you just bought your first ever camera, chances are you got a zoom lens with it. Zoom lenses allow you to shift between focal lengths, from wide to telephoto, depending on your lens' focal range, by turning the lens rings.

Batteries

Lastly, the battery is one of the most important parts of the camera. Most of its components will not work if not powered by one. Having a long-lasting battery lets you shoot more photos and shoot for extended periods, allowing you to find the perfect shot.

Here are other camera parts not mentioned by Rajan (2017), and Diprose (2023), but have been analyzed by Slidingmotion.com and these include:

Source: Swap, *Complete Guide of 30 Parts of Camera: Names, Functions & Diagram* https://slidingmotion.com/parts-of-camera-names-functions-diagram/ Visitors to the website can download and extract any location data from images on the website. slidingmotion.com

Red-Eye Reduction: After activating this function, it illuminates this lamp after half-pressing the shutter button. In the self-timer, it flutters for a specific time and stops blinking after the image captures.

Eyecup: It is a protection against external light.

Dioptric Adjustment Knob: Every person doesn't have a clear vision to see the image through the viewfinder. Due to that, this knob helps to adjust the viewfinder clarity.

Live Shooting Switch: We can activate or deactivate the live shooting mode by pressing the movie shooting switch. By activating this mode, we can record live at any time with only one click and see it on the LCD.

Quick Control Button: By pressing this button, we can see all the settings and functions on your LCD screen to select as per requirement.

Multi-Controller: It is a controller that helps to move the menu up-down, left-right, to move the magnified display. It helps to select a required function during live shooting or photography.

Erase Button: We can erase/delete unwanted images by pressing this button.

Playback Button: It helps to see the earlier images we have captured on the LCD monitor.

Menu Button: This button helps us to get all the functions of the camera. We can select these functions as per our needs and requirement.

Display Button: It allows you to On/OFF the display of the camera.

Power Switch: The power switch has 3 modes. ON, OFF, and standby. With this, we can power ON/OFF the camera. When we switch on the camera & keep it ON for a prolonged period, it automatically goes on to standby mode to save power.

Speaker: Whenever we record a video, we can store them in memory. While playing this video, the speaker gives an audio sound. With the main dial, we can adjust the sound.

Strap Mount: It is for connecting straps to the camera. It makes it easy to handle the camera and protects it from dropping. So we can balance them while doing photography.

Mirrorless Cameras

A DSLR camera uses a mirror to reflect light from the lens to the optical viewfinder. When a photo is taken, the mirror flips up to allow light onto the image sensor. A mirrorless camera, as the name suggests, lacks this mirror mechanism. Instead, the light goes directly onto the image sensor, and the image is previewed digitally on the screen or electronic viewfinder. Mirrorless cameras are often more compact, while DSLRs may offer a more traditional handling experience and optical viewfinder (Ranjan, 2017).

According to MasterClass (2021), Mirrorless cameras are the new wave of digital photography. They're small, light, and offer conveniences over another common camera type: DSLR cameras. Professional photographers have long opted for DSLRs, but entry-level mirrorless cameras are making it easier than ever for both the veteran and novice photographer to capture interesting shots.

Learn more about the key differences between mirrorless cameras and DSLRs, as well as the pros and cons of using each camera system (MasterClass, 2021).

A mirrorless camera, or compact system camera (CSC), is a high-end digital camera with a removable, interchangeable lens. Mirrorless cameras lack a reflex mirror, which means that light passes through the camera directly to the digital sensor. A mirrorless camera body is slim and lightweight, and features a digital display instead of a traditional optical viewfinder (MasterClass, 2021).

The components of a mirrorless camera include:

- The lens
- The shutter
- The image sensor
- The digital display

What Are the Similarities Between Mirrorless and DSLR Cameras?

Mirrorless and DSLR cameras offer image quality and customization options that are superior to smaller point-and-shoot cameras. Both mirrorless and DSLR cameras are interchangeable-lens cameras, which means that their lenses can be removed and changed to suit a photographer's needs. Mirrorless and DSLR lenses come in a variety of focal lengths that allow a photographer flexibility in capturing shots both near and far (MasterClass, 2021).

What Are the Differences Between Mirrorless vs. DSLR Cameras?

According to MasterClass (2021), there are many factors to consider when investing in a high-end camera. Both mirrorless cameras and DSLRs come with their own sets of benefits and drawbacks. Here are the eight most common differences in mirrorless cameras and DSLRs:

1. **Mirrorless vs. DSLR Cameras: Cost**

DSLR camera technology is well established, with wide support by third-party vendors, resulting in more choices and lower prices. DSLR costs range from as low as $150 for the cheapest models, to well into the thousands for the most expensive.

By contrast, mirrorless cameras are a newer and less common technology, with fewer choices of lenses and accessories. Mirrorless cameras start as low as $300, with high-end models reaching the mid to high thousands of dollars. However, costs for mirrorless cameras are decreasing as the technology rapidly catches up to DSLRs.

2. **Mirrorless vs. DSLR Cameras: Size**

Due to their mirror system, DSLRs are quite large and heavy, ranging from about 1 ½ to 2 ½ pounds. Mirrorless cameras, on the other hand, are lighter and more compact cameras, with many weighing under one pound.

3. **Mirrorless vs. DSLR Cameras: Image quality**

DSLR image quality depends on sensor size, with larger sensors offering higher resolution and image quality. The more common formats for DSLR sensor size include:

- **Full-frame**: This is the standard 35mm film format. Canon EOS and Nikon D-series are full-frame cameras.
- **APS-C**: A sensor that renders at about 40% of the full frame. Sony, Pentax, and Samsung all offer APS-C sensor cameras.
- **Four-thirds system**: Created by Olympus and Eastman Kodak, this is a smaller DSLR sensor that displays 26% of the full frame. (Even smaller? Micro four thirds.)

Both full-frame and compact sensors are also available in mirrorless cameras, but full frame mirrorless cameras typically cost more. Opt for a compact sensor with a high crop factor, and you'll end up sacrificing quality (especially in low light) for cost.

4. **Mirrorless vs. DSLR Cameras: Autofocus**

DSLR cameras use a technology called phase detection, which measures the convergence of two light beams, to drive their autofocus systems. Phase detection enables blazing fast autofocus functionality, which is essential for capturing sporting events and other fast-moving subjects.

Mirrorless cameras, meanwhile, tend to rely on slower contrast detection autofocus technology—but they're beginning to catch up.

5. **Mirrorless vs. DSLR Cameras: Shooting speed**

While both DSLRs and mirrorless cameras can take photos at very fast shutter speeds, a mirrorless camera's simpler internal mechanics enable it to take shoot faster than most DSLRs, particularly when it comes to a series or burst of images.

6. **Mirrorless vs. DSLR Cameras: Viewfinder**

DSLRs have an optical viewfinder, which enables the photographer to literally see through the camera lens in real time. However, this also means that a DSLR camera user must take a photo and then examine it to make sure their exposure is correct.

A mirrorless camera's electronic viewfinder, or EVF, adds the convenience of seeing what your photo will look like on an LCD screen before you press the shutter button. However, EVF preview quality tends to decrease in low-light situations.

Some DSLRs can mimic a mirrorless camera's convenience with "live view" mode, which raises the mirror to display a live preview of your photo. However, lower-cost DSLRs are slow to focus in this mode.

7. **Mirrorless vs. DSLR Cameras: Video**

Video clarity once made DSLRs a top choice for videography. However, the lack of an LCD screen and real-time display feedback for many DSLRs have led this option to fall out of favor in recent years.

By contrast, a responsive LCD screen with 4K technology, paired with the light camera body, make mirrorless cameras a great option for videographers.

6. **Mirrorless vs. DSLR Cameras: Battery Life**

Due to their electronic viewfinders and lighter camera body, mirrorless cameras tend to have shorter battery life than DSLR cameras, which can shoot without an electronic screen or viewfinder.

Lens system and exposure

According to MasterClass (2021), a camera without a lens is useless to a photographer. The lens is what focuses light from what you see through the viewfinder into a tiny, (typically) 35mm spot on the back of your film, DSLR, or mirrorless camera. If you remove the lens from your camera, the only kind of image you can produce is white light. Consequently, a high-quality lens can help

you capture great photos even with a cheap camera, while a low-quality lens can make the best camera mediocre and the resulting image quality, poor.

What Is a Camera Lens?

A lens is a tool used to bring light to a fixed focal point. In a film camera, the lens sends the light to the film strip, while in a digital camera (like DSLRs or mirrorless cameras), the lens directs light to a digital sensor. Camera lenses are made up of a series of glass plates that are convex (curved outward) or concave (curved inward), (MasterClass, 2021).

Camera Lens Characteristics

According to MasterClass (2021), all lenses filter and focus light so that it hits the sensor or film strip correctly. However, there are a variety of other factors that determine how a camera lens affects the look and quality of the final photo.

- **Focal length** is the measurement of distance (in millimeters) between the point of convergence of your lens and the sensor recording the image. The focal length range of a lens is expressed by a number, and that number tells you how much of the scene your camera will be able to capture. Smaller numbers have a wider angle of view and show more of the scene; larger numbers have a narrower angle of view and show less.
- **Aperture** is how big the opening is that lets light in, expressed in f-stops. F-stops are counterintuitive, because the larger the number, the smaller the opening. For example, f/2.8 allows twice as much light into the camera as f4, and 16 times as much light as f11. Aperture affects the depth of field: larger openings create a shallower depth of field, while smaller openings make more of the image in focus.
- **Maximum Aperture**. Lenses will list a maximum aperture on the barrel, indicating the maximum width a lens aperture can open. Typically, lenses with a wider maximum aperture cost a bit more. A lens with a wide maximum aperture is great for low light situations, so if you are considering night photography, it might be worth the investment.
- **Depth of Field**. Controlling the amount of the photo that is in focus is one of the photographer's best tools to help draw the viewer's eye where you want it. For example, landscapes are typically shot so that everything is in focus, so photographers will shoot at small apertures (e.g. f11 or f16). The depth of field varies with the type of lens, due to maximum aperture (MasterClass, 2021).

What Is Exposure In Photography?

According to Kennedy (2023), understanding exposure and mastering its usage can help you improve your photography skills in many different settings. Over time, no lighting situation will be too bright or too dark for you to manipulate to your own ends using the right angle, additional lighting equipment or the features on your camera. An overexposed photo tends to look too bright, which can make the colours look faded or distorted. An underexposed photo is the opposite, the colours look too dark. Note that sometimes people use too much or too little

exposure on purpose to create artistic effects, but you must learn the rules before you can break them.

What Is The Exposure Triangle?

Your camera's settings determine the exposure of your photos. The three settings responsible for this are as follows:

- **Shutter Speed:**

This determines the length of time the camera sensor remains receptive to the available light or is the amount of time the shutter remains open to let light expose the film or sensor. Shutter speed becomes extremely important when capturing movement, whether you want to catch a sharp final image or blur the object. Essentially, a slower shutter speed such as 1/25 lets more light onto the sensor and creates blurry moving subjects. Whereas a faster shutter speed such as 1/500 represents a shorter period of time and thus less light is able to hit the sensor, also freezes a moving object. Most adjustable cameras have a range of shutter speeds varying from one second to 1/1000 or 1/2000 of a second. These speeds are represented by whole number on the standard scale of shutter speeds. For a setting of 250 the shutter speeds works twice as fast as at a setting of 125 and half as fast as at a setting of 500.

- **ISO:**

This describes how the camera reacts to incoming light, based on the sensitivity of the sensor. Increasing the ISO speed (higher numbers) captures more light by digitally 'boosting' the sensor, the side effect of this process is the creation of digital noise - signified by visable grain and loss of saturation in the final image. Ideally, most people aim for the lowest ISO possible. Common speeds range from as high as 6400 to as low as 100 but often go much higher and lower. While it is often best to keep the ISO as low as possible, modern cameras have become much better at handling noise in recent years making higher ISO speeds more usable than they have been in the past. Most modern cameras still produce acceptable image quality at ISO speeds of 3200 and below

- **Aperture:**

Most commonly measured in f/stops, this determines how much light is able to pass through your camera lens and onto the camera sensor. Much like with shutter speed, lower numbers (i.e. f/1.8) equal a wider opening of the lens, and thus more light. Whereas higher numbers (i.e. f/8) represent a closing of the aperture blades, giving you less light. The f/stop also determines your 'depth of field' which is the way we measure the amount of things which are in focus.

These three features create what is known as the 'exposure triangle'. Understanding what each setting contributes to the final effect is the first step in artfully manipulating exposure. Keeping a balance between the three settings is essential to capturing your subject exactly as you require. For instance if you want to capture sharp frozen movements of a dancer on a dark stage, they may be moving too fast for a slow shutter speed, but you want to ensure their entire body fits within your depth of field, requiring a narrower aperture - so a high ISO might be the only way

you can capture the subject as you intend. This could easily be reversed if you instead wanted to feature the motion blur in your images - thus allowing the use of a slower shutter speed. It's all about assessing the situation and making a call based on what you're looking to capture and how.

Examples of Which Aperture to Use

Mansurov (2022), explores where a photographer may want to use various f-stops.

- **f/0.95 – f/1.4** – Such "fast" maximum apertures are only available on premium prime lenses, allowing them to gather as much light as possible. This makes them ideal for any kind of low-light photography (such as photographing the night sky, wedding receptions, portraits in dimly-lit rooms, corporate events, etc). With such wide f-stops, you will get very shallow depth of field at close distances, where the subject will appear separated from the background.
- **f/1.8 – f/2.0** – Some enthusiast-grade prime lenses are limited to f/1.8, which still has very good low-light capabilities. Also, if your purpose is to yield aesthetically-pleasing images with shallow focus, these lenses be of tremendous value. Shooting between f/1.8 and f/2 typically turns your backgrounds nice and creamy for portraiture and other similar types of photography.
- **f/2.8 – f/4** – Most zoom lenses are limited to a maximum aperture of f/2.8 to f/4 at best. While they are not as capable as f/1.4 lenses in terms of light-gathering capabilities, they are still enough to shoot in reasonably low light conditions, especially if the lens or camera has image stabilization. You'll get some subject separation at these apertures, but usually not enough to make the background completely fuzzy. Such apertures are great for travel, sports, and wildlife photography.
- **f/5.6 – f/8** – This is the right starting point for most landscape and architectural photography. It's also ideal for documentary and portrait photography where you don't want a blurry background. Also, most lenses are sharpest around f/5.6, which doesn't matter as much as getting the right depth of field, but is still nice.
- **f/11 – f/16** – Typically used for photographing scenes where as much depth of field as possible is needed, like macro photography or landscape photography with a nearby foreground. Even though these apertures offer more depth of field, they do lose some low-level sharpness due to the effect of lens diffraction.
- **f/22 and smaller** – Only shoot at such small apertures if you know what you are doing. Sharpness suffers greatly at f/22 and smaller apertures because of diffraction, so you should avoid using them when possible. If you need to get more depth of field, it is usually best to move away from your subject or use a focus stacking technique instead.

What Is a Long Exposure in Photography?

Have you ever seen photos of waterfalls where the water appears unbelievably smooth and beautifully blurred? There are several ways to achieve this, but the most common option is to use a long exposure.

This creates what is known as a motion blur. It works even with people. If you took a long exposure photo and someone walked through it, you would see a ghostly blur in human form.

To create long exposure photography, professionals slow down the shutter speed. How much you need to slow your shutter speed is debatable. Use speeds below one second (Kennedy, 2023).

What Is Double and Multi Exposure In Photography?

Photographers can do this prior to the editing process and overlay two photos to create one artistic effect. When the final product involves more than two photos, then this is known as multi exposure and follows the same premise.

Using this method might allow you to create photos that are unique and carry symbolic meaning. Some people also use it to show the movement of one object at multiple different points in the same frame without blurring them in the way that a long exposure does. (Kennedy, 2023).

Summary

Information about the parts of a camera help to use every function to make your photography more impressive. Mirrorless cameras are the new wave of digital photography. They're small, light, and offer conveniences over another common camera type: DSLR cameras. Professional photographers have long opted for DSLRs, but entry-level mirrorless cameras are making it easier than ever for both the veteran and novice photographer to capture interesting shots. Aperture size the various sizes of an aperture are called f-stops or f- numbers. On adjustable cameras, the f-stops generally include 2, 2.8, 4, 5.6, 8, 11, 16 and 22. The smaller the f-stop numbers the larger the size of the aperture. The larger the f-stop numbers the smaller the size of the aperture. Like shutter speeds each f- stops let in either twice as much light as the preceding setting or half as much light as the next higher setting. Changes in the size of aperture affect the overall sharpness of the picture. Shutter speed is the amount of time the shutter remains open to let light expose the film. A slow shutter speed lets in large amount of light and a fast shutter speed admits only a little. Exposure is the total density of light allowed to fall on the photographic medium (photographic film or image sensor) during the process of taking a photograph. Changes in the size of aperture affect the overall sharpness of the picture. As the aperture becomes smaller, the area of sharpness in front of and behind the subject becomes larger. This area of sharpness is called the depth of field. It extends from the nearest part of the subject in focus to the furthest part in focus. A small aperture, such as f/11 or f/16, creates great depth of field. As one opens up the aperture, the area in focus becomes shallower. At f/2 or f/4, the subject will be in focus, but the objects in the foreground and background may be blurry.

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