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DepED
DEPARTMENT OF EDUCATION

SELF-LEARNING PACKAGE I

ICT 10

Quarter 1 | Week 5

Exposure in Photography

Learning Competency:

Identify the effect of aperture and shutter speeds and how they control exposure

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WRITERS

Ready to Launch!

The role in exposure, the choice of aperture, shutter speed and ISO have a significant impact on the look and feel of your pictures.

Exposure - allowing light to hit the camera sensor to record an image - is measured in what's commonly referred to as 'stops', with each stop representing either double or half the level of exposure of the adjacent stop. Increase the exposure by one stop, and the camera sensor receives twice the level of exposure. Decrease it by one stop, and the exposure level is halved.

In this lesson, you will know the three pillars of exposure that make up the exposure triangle.

Aim at the Target!

At the end of this module you are expected to:

1. *Explain what is exposure.*
2. Identify the three pillars of exposure that make up the exposure triangle.

Try This!

Activity 1. Direction. Unscramble the following words.

WORD	CLUE
1. EARPUETR	Controls the amount of light that reaches the sensor
2. TRETUHS DSPEE	Controls the duration of light that reaches the sensor.
3. UROSEEXP	The amount of light which reaches your camera sensor or film.
4. NMIOTO RLUB	Purposeful streaking or **blurring** of an object in **motion** in a photo for visual effect
5. EPTHD FO LEIFD	The amount of your scene, from front to back, that appears sharp.

Keep This in Mind!

Activity 2. Identifying a camera settings

Direction: Identify what camera settings (SHUTTER SPEED, APERTURE, ISO) was emphasized in the pictures below:

1

2

3

Abstraction and Generalization

Learning Exposure For Photography

The science behind photography is all about how a camera captures light, so understanding how to control exposure is essential to becoming a good photographer. In this video we're going to go over the 3 pillars of exposure that make up the exposure triangle. When you understand these 3 components, then you will have a mastery in both the technical and artistic aspects of photography.

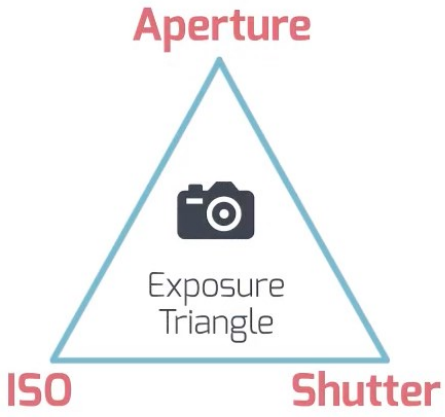


Figure 1. Exposure Triangle– three pillars of exposure

Understanding Exposure

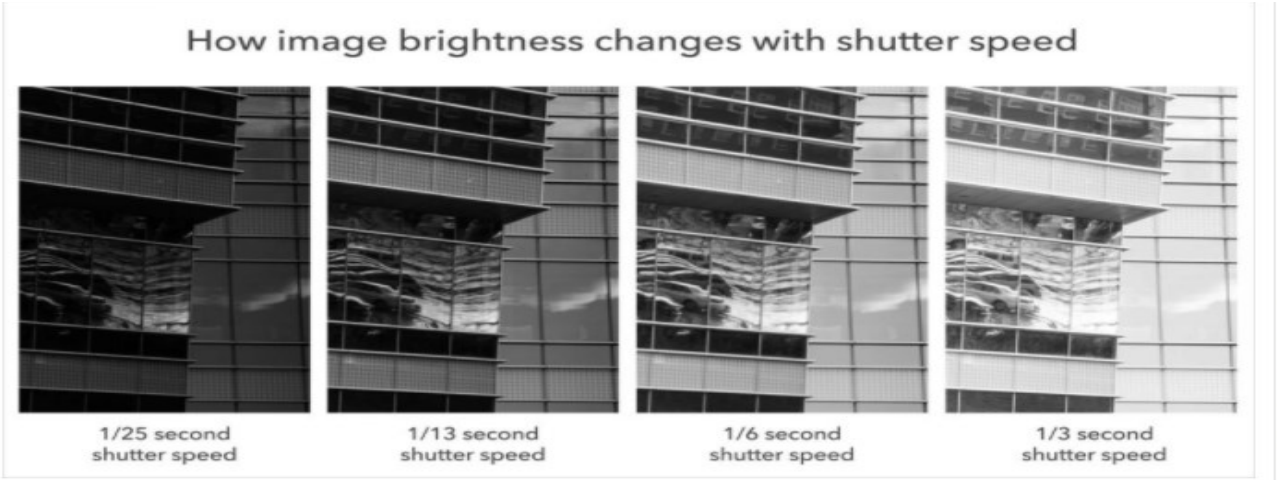
1. Shutter Speed

The shutter speed controls the duration of light that reaches the sensor. When you take a picture the shutter door opens, revealing the sensor for a duration of time that you or the camera chooses, then closes. The duration is measured in seconds or fractions of seconds. This could be 1/100 of a second, or 1/10 of a second, or three seconds, or five minutes.

So, why does shutter speed really matter? There are two main reasons:

First, as you would expect, a long shutter speed (several seconds) lets in a large amount of light. If you take a normal daytime photo with a 30-second shutter speed, you will capture an image that is completely white. The opposite is true, too; a quick shutter speed only lets in a small amount of light. If you take a photo at night with a 1/8000-second shutter speed, the photo will be completely black.

Take a look at the series of examples below. Here, 1/25 second was too dark ("underexposed"), and 1/3 second was too bright ("overexposed"). This should give you an idea of the brightness differences with shutter speed:



Second, the only other big effect is the *motion blur* in your images. In **photography**, **motion blur** is the purposeful streaking or **blurring** of an object in **motion** in a photo for visual effect. It's a great technique for capturing **movement** in a still image, and is often used in both nature **photography** and sports **photography**.

Shutter speed is the most critical factor to consider when capturing motion blur. A shutter is the curtain in front of the camera sensor that opens to let light in when you take a shot. A fast shutter speed will freeze motion, while a slower shutter speed will cause your subject to blur.

The more you increase your shutter speed (left to right), the more motion blur you will get

Take a look at the images below. The foreground grass and the waves behind them were all moving quickly. As you can see, depending upon the shutter speed, there was a major difference in motion blur:

the brightness of these photos are equalized using two other settings: aperture and ISO. Otherwise, the six second exposure would be much brighter.)

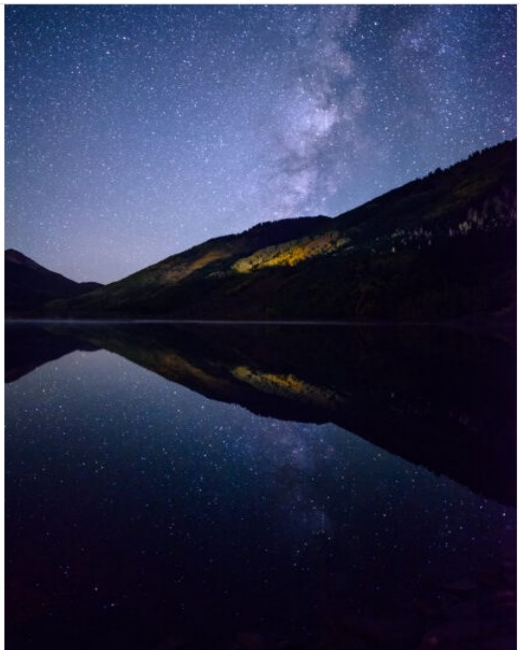
2. Aperture

You can think of aperture as the pupil of the lens. By widening or narrowing itself, the aperture controls the amount of light that reaches the sensor. Aperture is measured in fractions or f-stops, like 1/2.8 or 1/4, but lenses will only show the denominator: 2.8, 4, 5.6, 8, etc. This is why the lower the aperture number, the wider the aperture gets.

Aperture and Exposure

The larger your aperture, the brighter your photo – the more light you capture. Again, your pupils work just like this, too; they open or close to let in different amounts of light. So, when you are trying to expose a photo properly, it is crucial to pay attention to your aperture setting.

A large aperture lets in more light. Apertures like f/1.4 and f/2 practically let you see in the dark. On the flip side, a small aperture like f/16 (with nearly closed aperture blades) lets in far less light. If you try to photograph Milky Way at f/16, your final image will be essentially black.



For this photo, used an aperture of f/1.8 — the largest aperture on my lens. With a smaller aperture, you wouldn't see so much detail in the Milky Way. The photo would be much darker.

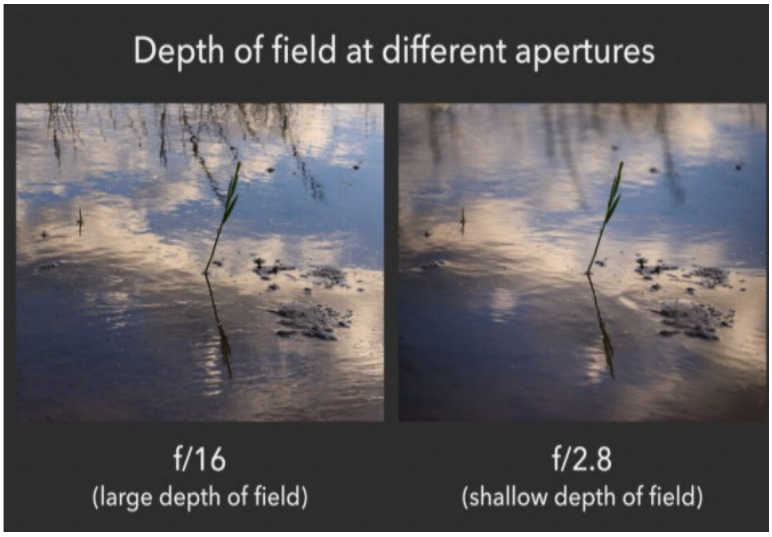
Aperture and Depth of Field

The other important effect of aperture is on depth of field.

Depth of field is the amount of your scene, from front to back, that appears sharp. In a landscape photo, your depth of field might be huge, stretching from the foreground to the horizon. In a portrait photo, your depth of field might be so thin that only your subject's eyes are sharp.

To be specific, small apertures (like f/11 or f/16) give you a large depth of field. If you want everything from front to back to appear sharp, those are good settings to use. Large apertures (like f/1.4 or f/2.8) capture a much thinner depth of field, with a shallow focus effect. They are ideal if you are trying to isolate just a small part of your subject, making everything else blurred.

Here is a sample comparison:

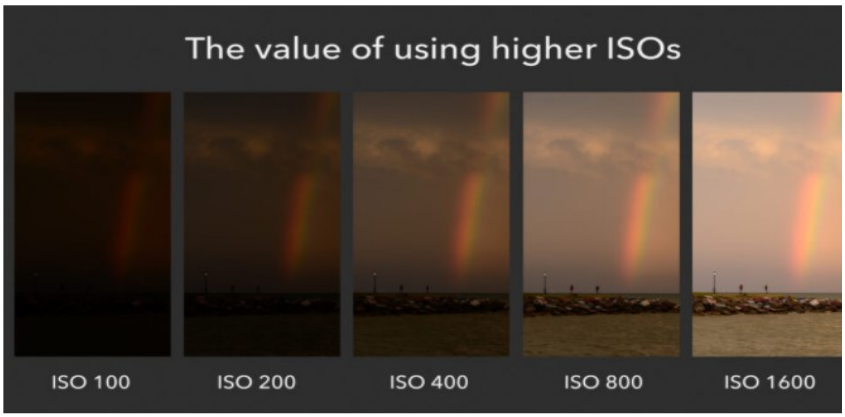


3. ISO

As you can see, that is a significant difference. The photograph on the left has a larger depth of field, which means that more of the scene appears sharp from front to back. However, the f/2.8 photo on the right has a pleasant shallow focus effect. In this case, it is arguably the better image.

ISO is a measurement representing the sensors sensitivity to light. The higher the ISO number the more sensitive your sensor will be to light, which means that at higher ISO's you would require less light to get to a proper exposure.

It is useful to raise your ISO when you have no other way to brighten your photo – for example, when using a longer shutter speed will add too much motion blur, and you are already at your widest aperture. It is a very valuable setting to have, but it is not all good news. When you raise your ISO, your photos *will* be brighter, but you'll also emphasize grain (otherwise known as noise) and discolored pixels in the images along the way.

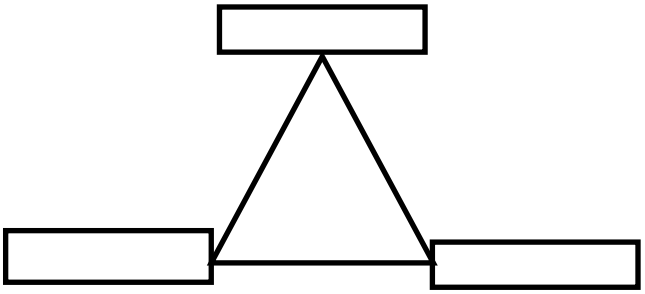


This series demonstrates why you might want to raise your ISO. Although it does make noise more visible, using a high ISO is sometimes the only way to capture a bright photo.

Application.

Direction: Copy and label the exposure triangle below.

Activity 3. Labelling the exposure triangle



Reflect

Complete the statements below.

I understand _____

_____

I don't understand _____

_____

I need more information about _____

Reinforcement & Enrichment

Activity 4. Direction. Observe each picture very carefully. Which among the picture is OVEREXPOSED, UNDER EXPOSED and NORMAL EXPOSED. Explain.

1. 

2. 

3. 

Assess Your Learning

I. Multiple Choice. Read each item very carefully. Select the best answer. Select the **letter** of your choice.

1. To create a "correct" exposure you may use :
a. your aperture b. your shutter speed c. ISO d. All of the above
2. The aperture is usually the first thing you should set :
a. for artistic reason c. all of the above
b. for sharpness reasons d. None of the above
3. Raising your ISO will cause your images:
a. to be brighter c. to have slightly less detail
b. to have slightly more gain d. all of the above

4. The benefit of raising your ISO is:
a. allowing higher shutter speeds for sharp images.
b. a proper exposure almost always has better image quality.
c. more creative options for your aperture and depth field.
d. all of the above
5. Which is NOT true about aperture
a. A small aperture like f/16 lets in near light.
b. The aperture controls the amount of light that reaches the sensor
c. The other important effect of aperture is on depth of field.
d. none of the above

II. Explain what is exposure triangle. **(5 points)**

References & Photo Credits

https://www.slrlounge.com/workshop/exposure-triangle/
https://www.masterclass.com/articles/how-to-capture-motion-blur-in-photography#
https://dhsartstudio.weebly.com/uploads/4/7/5/2/475213/exposure_graycard_wb_assign_s2014v2.pdf
https://www.photoblog.com/learn/what-is-motion-blur-and-how-to-photograph-
https://www.slrlounge.com/workshop/quiz-chapter-2-understanding-exposure/
https://photographylife.com/what-is-exposure#shutter-speed
https://www.techradar.com/how-to/the-exposure-triangle