

Look at the google slides to explore the variety of images that we will be looking at creating. Then read the information about the functions and how they work together to create a correct exposure.

Exposure

To get a correct exposure within your camera weather its digital or analog you need three things

- 1. ISO
- 2. Aperture
- 3. Shutter speed

It is the combination of these three things put together in different combinations that will again and again give you the correct exposure.

Although if you are not paying attention you're your light meter it is easy to get the wrong exposure and either over expose or under expose your image.

Think of a perfect exposure as a perfect triangle - all the angles are equal, all the sides are equal. Now if you change just one part of that exposure or triangle, it is no longer perfect so you will need to change another point of the exposure or triangle an equal but opposite amount to make that triangle and therefore the exposure perfect again



As you can see, all the elements of exposure have an effect on the others - so with that in mind we need to know the how's and whys of all the different elements to best understand how to get both a good exposure and the desired results in our photographs.

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ISO is the sensitivity to light of the sensor or film. The higher the sensitivity, the less time (shutter speed) or the less amount of light (aperture) needs to hit the sensor for the correct exposure. It is adjustable in most cameras, in a range of about 200 to 1600. High end cameras can go way beyond that.				
50 100 200 400 800 1000 1250 1600 3200 6400				
Less Sensitive 🚤 🛌 More Sensitive				
Low Noise 🛁 Higher Noise				
Plenty of Light 🚽 🔶 Low Light				
ISO				
We use ISO to help us achieve what we want to do with the other two sides of expecture: Aperture and Shutter Speed				
You may ask; Why don't we just use the most sensitive one and forget about it? Well because the downside of higher ISO is that it increases the noise or grain in our images. This can sometimes make the image look so bad that it becomes unusable (or at least un-printable at a decent size).				
So our objective is to use the lowest ISO possible, but balancing that to what we want to achieve.				
Shooting outdoors on sunny or even slightly overcast days we can use ISO 100 or 200 with ease. On heavy overcast days we may need to change our ISO to 400. Especially if we use a small aperture (letting in less light) for shooting a deep depth of field landscape shot, while still being able to maintain a shutter speed that we can safely handhold without a tripod.				
As we move indoors to a brightly lit room we may need to move up to ISO 800 - 1600 to take natural light photos without the need for using our flash.				
As we move to dimly lit rooms or street scenes, we may need to move up to ISO 3200 or higher (remembering again that not all cameras can shoot at these higher ISO without excessive noise).				
Here are some close-ups crops to see the effects of ISO noise in an Image.				
2 abc 2 abc 2 abc				

Shutter Speed

Shutter speed controls how long the light comes through our aperture to our digital sensor or film. The longer the time, the more light will hit their surface. That is technically what shutter speed does.

Artistically, shutter speed controls motion. Whether we want to freeze motion or show motion, shutter speed is the portion of exposure that will control that aspect.

Shutter speeds are expressed in fraction of a second 1/8, 1/125, 1/1000 etc. but in most modern digital cameras you may not see the 1/ expressed (but they still are fraction). You most likely see the above expressed as 8, 125, 1000 etc.

The first consideration we have to think about is: can we hand-hold the camera at this shutter speed and not have the slight movement of the camera show up in our image making it blurry or less sharp? Most people are able to hand hold a camera in the range of 1/60th to 1/200th with a normal lens on. When you use telephoto lenses you may need to use a faster shutter speed.

If you cannot hand-hold, you must use a tripod.



Beyond that we can now make an artistic judgment - do we want to stop action, or show movement?

And this is a judgment you need to make. Sometimes we may want to freeze our subject and keep it sharp and clear. Other times we want some blur on the subject to give the viewer the impression that the object is moving or is at speed.

In this image of the trolley downtown, in the first example we used a high shutter speed to stop the trolley as it moved past the buildings (which may be what we want). But does the viewer really know if the trolley was moving past or just stopped at the station?

In the second example we slowed the shutter speed way down to .3 (3/10th) of a second. Now the viewer can tell that the trolley is moving at speed past the building.



Again this is the decision **you** have to make.

What do you want to convey?

Other examples of using a high shutter speed to stop action:

Stopping the flight of a jet as it flies by, or a car at high speed. Freezing the swing of the bat of a baseball player, a high diver in mid arc above the water. Again you would use a high shutter speed to freeze the movement or action.



In the image below, a slow shutter speed was used (on a tripod) to silken the water and show motion. The same can be done for a waterfall, an ocean or a fountain.



Aperture

Aperture is a circular opening (somewhat) in our lens that is adjustable from a very small circle to almost as large as the lens itself. We adjust it to let more or less light hit the digital sensor or film. Think of window blinds as your aperture, and the wall in your room opposite the blinds is your sensor or film. As we open the blinds, more light comes through and we can see the wall behind us get brighter and brighter







Likewise, as we open up the aperture on our lens, we get more light on our sensor or film. The Aperture also controls the depth of focus within your photograph (which will be explored in more depth later).

The opening of our lens or Aperture is expressed in f stops, these numbers indicate a fraction of the hole's size in relation to the focal length of the lense and here is a very typical range of f stops:

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f1.4, f2.0, f2.8, f4, f5.6, f8, f11, f16, f22 Large Opening Small Opening				
More Light Less Light				
Shallow D.O.F Deep D.O.F				
Aperture				
Aperture				

You may wonder, why do the largest openings have the smallest numbers?

Well, think of it this way; imagine the number as the bottom number of a fraction. So if we have f 4 that would be 1/4 and f8 would be 1/8 and 1/4 is larger than 1/8.

The Aperture numbers I have above represent **"Whole Steps"** of light from one to the next. **What is a whole step?** A whole step represents the doubling or halving of the light through the lens. So f1.4 will let in twice as much light as f2.0. f2.0 twice as much light as f2.8 or we can also say that f2.8 is half as much light as f2.0.

Remember the **larger the f-stop number is, the smaller the hole in the lens** is and vice versa the **smaller the f-stop number the larger the hole is**.

So we have all these different apertures available to let in different amounts of light.

Why should I care and why should choose one over the other?

This is where the artist side comes in - to help make those decisions. The following are different artistic styles we can use and the different parts of an image that Aperture effects.

Depth of Field

The Depth of Field is the relation between When we look at an image, there is a part that is in perfect focus and then there are parts that begin to be out of the range of focus.

You can have a small Depth of Field (DOF) where only your subject is in focus, or you can have a deep Depth of Field where practically everything is in focus - or really anywhere in between.

Depth of field is determined by three things; aperture (f stop), distance to your subject, and lens focal length (50mm, 200m etc), with Aperture having a profound effect on DOF. Let's see what an image looks like just varying the aperture and leaving alone the other two parts:

Photographers that shoot portraits usually use larger apertures (low numbers) for a shallow DOF to highlight and isolate their subjects. Landscape photographers usually use small apertures to have a very deep DOF, all the way from the foreground to the background.

As usual, there are exceptions to these rules and that is ruled by the photographer's artistic ideas and vision.











Putting It All Together for the Perfect Exposure

What is a perfect exposure?

Well technically, every scene we shoot has a dynamic range. The dynamic range is the difference between the brightest part of that scene and the darkest part. Our sensor or film has a dynamic range too (technically it's exposure latitude - but we're picking hairs).

What we hope to accomplish is to capture that dynamic range of the scene into our image. So that the brightest part of the image (say the sky) is not blown out and devoid of detail, and the darkest part (shadows or foreground dark areas) are not lost into noise.

Sometimes the dynamic range of a scene can exceed the dynamic range of our camera, so we have to make a choice of what part we want to have the best exposure. Usually with digital it is best to have the brightest areas in good exposure and not blown out. But it can depend on the situation.

If we are shooting a portrait, we want our subject to be perfectly exposed even if that mean that another part of the image my not be. Some times that is a sacrifice we have to make, if we cannot change the conditions of the shoot nor have the option of supplementing the lighting.

This first image is overexposed. There is good light on the rocks but the sky and clouds are missing detail because of overexposure.

This image is underexposed. Great detail in the sky but the foreground is dark and all the detail is lost to noise there in the rocks

This image is exposed pretty well in a difficult high dynamic range lighting situation. There is great detail and color in the sky and you can make out all the rocks and foreground areas completely.

The truth is, while there may be technically a good exposure, you may use exposure artistically too and purposely blow out areas or choose a darker mood to an image. You can let your artistic eye lead the way when you need to.

Overexposed







The Exposure Triangle in Practice

Now that we have a basic understanding of the three elements of exposure. Let's examine how we might use them and see the interaction between them.

Let's say we wanted to shoot an automobile race and we want to stop the action. It's a bright sunny day so we are going to use ISO100. We want to stop the action of the car going by us very fast, so we choose 1/1000 of a second shutter speed - but with that shutter speed according to our meter in our camera that would give us an aperture of 5.6.

So we know from what we learned about aperture, that may give us a shallow depth of field and there are other race cars we want to be within reasonable focus. So how could we fix this? We can't change our shutter speed, so we turn to the other part of our trio; ISO.

If we move our ISO up two stops to 400, we can then make out aperture two stops smaller and get the depth of field we need plus the shutter speed we need to stop the action.



We still have our camera set the same, but while we are at the races we spot a beautiful classic car in the parking lot. We want to isolate it from the ugly background so we decide that we now need a shallow depth of field. So we open our lens up to f4 on our 200mm lens.

This gives us great separation and DOF but that drives our shutter speed up to 1/6000th of a second! This would be OK - we are hand holding our camera, not stopping any action - but we want this to be a great shot worthy of a very large print. So why don't we lower our ISO two steps to ISO 100, That brings our shutter speed down two stops to a still fast 1/1600 but because we lowered our ISO we will have much less noise in our image to be printed large.



Remember back in the section on aperture I posted a picture shot at night on the street. I had my aperture at f8. Now I knew that it would be low light so I boosted my ISO to 3200 but I then had a shutter speed of 1/8th of a second - too slow to hand hold. But, I was also without a tripod.

Since the scene was flat and no real depth to it (and I didn't need to worry about DOF), I opened my aperture to f2.8 that allowed me to put my shutter speed at 1/60 at which I could very easily hand hold.

Conclusion

Notice something? For every action we take one way in stops, we make an equal but opposite adjustment in stops on another part of the exposure triangle. When we let more light in one place, we control it in another place to give us the perfect exposure.

Exposure and the three elements of it; Aperture, Shutter Speed and ISO, can be a very complicated and full of science subject. But I hope I have given you some of the basics and in a way that is easy to understand so that you may use your camera more efficiently. Better still, I hope I have allowed you to take your *art* to the next level because of the technical understanding.

Film Developing					
	Ratio chemical : water	Time DELTA 100 ISO =7 MINS DELTA 400 ISO =9 MINS (AT 20 DEGREES C)			
DEVELOPER	1:2	AGITATE EVERY 30SECS			
1 FILM : 300MLS 2 FILMS : 600MLS	100MLS : 200MLS 200MLS : 400MLS				
<u>STOP BATH</u>	1:40 7.5 MLS : 292MLS 15 MLS : 585MLS	30 SEC CONTINUIOUS AGITATION			
<u>FIXER</u>	1:4 60MLS: 240MLS 120MLS : 480MLS	2MINS AGITATE EVERY 30SECS			
<u>WASH</u>		10 MINS UNDER RUNNING WATER			
ADD A FEW DROP OF WETTING AGENT – SHAKE UP, DO NOT WASH OFF					
TAKE FILM OFF REEL CAREFULLY AND HANG IN THE DRYING CUPBOARD					
DEVELOPING A FILM					



- 6. Describe each stage
- 7. How and why is the developing tank agitated?
- 8. Describe the five common faults when developing film or negatives

Answer these questions in your book or folder

Common Faults in Negatives

Overexposed negatives: Overexposed negatives occur when you allow too much light onto the film when you are taking a photograph. To prevent this you should ensure that you check your light meter before taking each photo.

Overexposed negatives look quite dark and are what we call dense. It is difficult to see the detail within the negative due to the over exposure (too much light) on the film.

Underexposed negatives: Under exposed negative occur when you do not let enough light onto the film when you are taking the photograph. To prevent this you should ensure that you check your light meter before taking each photo.

Underexposed negatives look very pale and it is hard to see the details due to the thin quality of the negatives when printed they will be washed out and grey. You will need to use a high filter to try to counter act that.

Overdeveloped negatives: Overdeveloped negatives occur when one or more of the following has happened:

- The developer was left in the tank for too long.
- The temperature of the developer was too warm
- Not enough developer was used or
- Old developer was used.

To prevent the above occurring, you must ensure that you mix the developer properly, the time used is correct and that you check the expiry date of the chemical.

Underdeveloped negatives: Underdeveloped negatives occur when one or more of the following has happened:

- The developer was left in the tank for too long.
- The temperature of the developer was too cold
- Not enough developer was used or
- Old developer was used.

To prevent the above occurring, you must ensure that you mix the developer properly, the time used is correct and that you check the expiry date of the chemical.

Black negatives: if all of your film turns out black it means that it has been exposed to light.

Clear negatives: If all of your negatives are clear it means that your film may not have been exposed to light. This means you either did not load the film properly or that you put the fixer in before the developer.

Good quality negatives

A successful negative will have the following qualities

- A clear sharp image
- A variety of tones from very light to very dark
- Be clean and free from dust marks and fingerprints
- Be evenly developed.



Work To Do Whilst away due to Coronavirus

- If you have access to a digital camera at home please use in and play around with the functions that are listed above.
- If you don't not have a digital SLR but have a phone I would like you to play around with trying to take photos that display a range of techniques even though you are unable to control to actual settings.

Stage 5 Photographic and Digital Media - UNIT 2 - OUTLINE AND ASSESSMENT

UNIT 2	Getting to Know your Camera				
featuring	Introduction to Photographic Practice through Critical and Historical Study SLR Camera construction, functions and use Printing practice using negatives Film development and procedures Selection of subject matter for interest and meaning				
DURATION	DURATION : 10 weeks week 8 Term 2 17 th June				
CONTENT	: Students to :				
•	Investigate photographic principles through the understanding and use of the SLR camera				
•	Develop an understanding of photographic film and its development processes				
•	Demonstrate knowledge and understanding of darkroom and printing procedures using self-produced negatives				
•	Investigate the selection of subject matter and composition				
OUTCOME	S: By investigating the nature of photography as a practice, which involves making and critical/historical studies students to :				
•	5.1 – develop range and autonomy in selecting and applying photographic conventions and procedures to make photographic works				
•	5.2 – makes photographic works informed by their understanding of the function of the relationships of the conceptual framework				
•	5.5 – make informed choices to develop and extend concepts and different meanings in the photographic work				
•	5.6 – select appropriate procedures and techniques to make and refine photographic works				
•	5.9 – use the frames to make different interpretations of photographic works				
•	5.10 – construct different critical and historical accounts of photographic and digital work				
ASSESSME	NT: MAKING (PRACTICAL) Marks 60				
Due Week	Create Photographs that demonstate Selective Focus photographs Maxium Depth of Field photographs Blurred movement photographs Freeze action photographs B mode photograph Panning photograph				

Image evaluation – for each photograph submitted					
CRITICAL/HISTORICAL STUDY:					
Due Week	Conceptual Framework Stu	ıdy on Tamara Dean	- Follow separate work sheets		
	explaining tasks		25		
	Photo file – collection of in	nages demonstaring	all making techniques		
	explored and briefly analise	ed.	5		
Due Week	Diary/Journal Presentation i	ncluding knowledge	and understanding 10		
	-		-		
Your diary/journal is for recording what you do, how you do it, when, where and why! This is very					
important in Photography if you want to repeat your continued success, especially with exposure details and					
techniques u	sed.				
Student:		Signature:	Date:		

Teacher: <u>P Thorpe</u>

_____Signature:__

Date:











