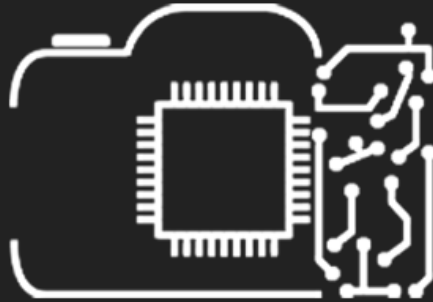
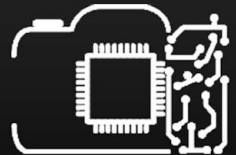


Let's dive into...
The Digital Camera!



NTUA Photography Club

Welcome to the
3rd Photography Lesson

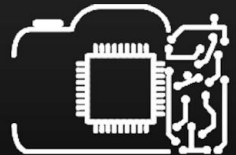


What is a Digital Camera?

A **still camera** that records images in **digital form!**

What does it consist of?

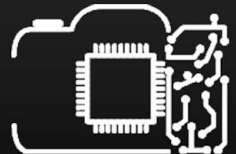
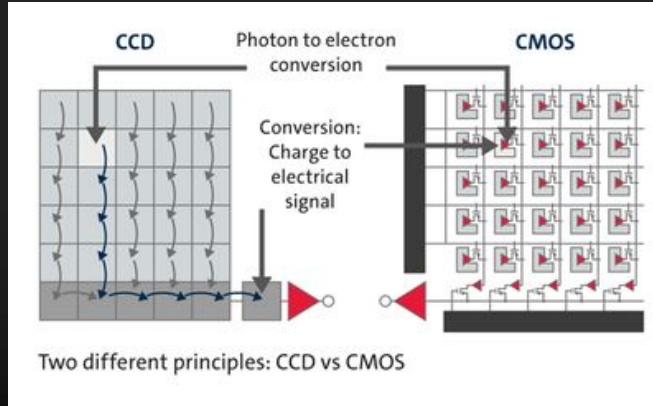
- Photometer
- Lens - Aperture
- Shutter
- Sensor



What about the Sensor?

Types:

- **CCD** Sensor Technology
(Charged Coupled Device)
- **CMOS** Sensor Technology
(Complementary Metal Oxide Semiconductor)
- Foveon X3 Sensor
- LiveMOS Sensor



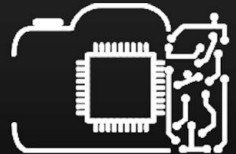
What about the Sensor?

Sizes:

- **Medium Format** (53.4x40mm) 0.65x
- **Full Frame** (36x24mm)
- APS-H (28.1x18.7mm) 1.3x
- **APS-C** (23.6x15.8) 1.6x
- Four Thirds (17.3x13mm) 2x

Crop Frame

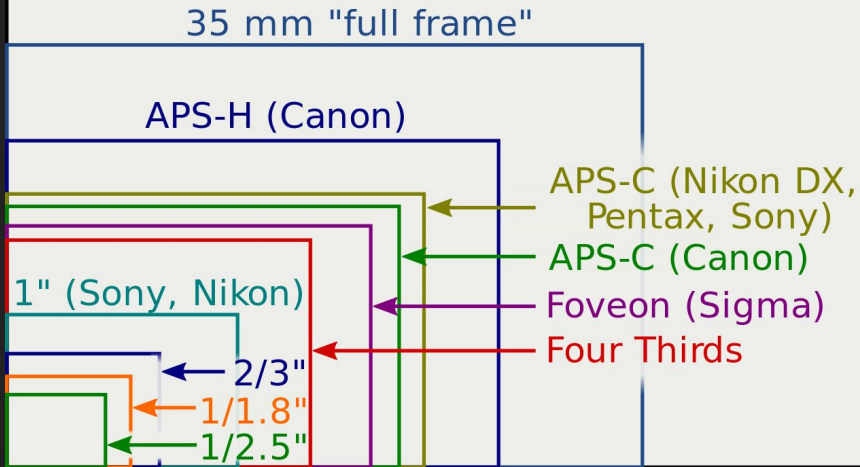
...also, a sensor has a Pixel count. Note that 1 Megapixel = 1 million Pixels



x

What about the Sensor?

Medium format (Kodak KAF 39000 sensor)



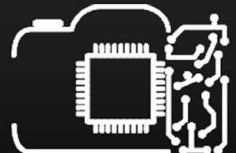
CAMERA SENSOR SIZE COMPARISON CHART

	MEDIUM FORMAT	FULL-FRAME	APS-C	MICRO 4/3	1"	1/2.55"
PICTURE						
SENSOR SIZE	53.0 X 40.20 MM	35.00 X 24.00 MM	23.6 X 15.60 MM	17.00 X 13.00 MM	12.80 X 9.60 MM	6.17 X 4.55 MM
CROP FACTOR	0.64	1	1.52	2	2.7	5.62
CAMERA						

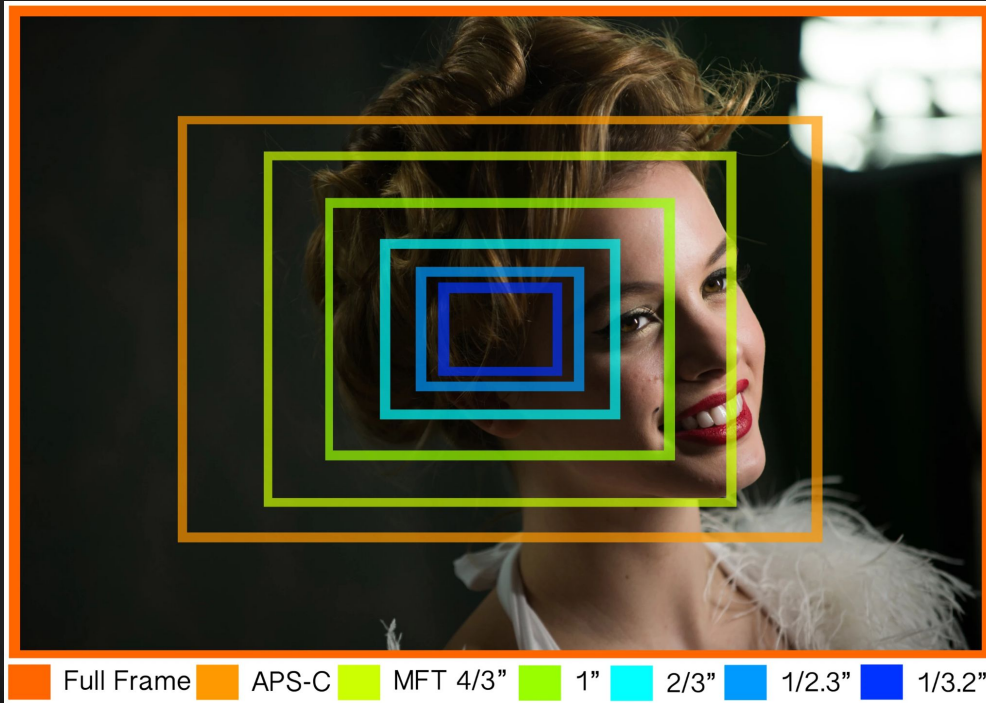
capturetheatlas.com



@Capturetheatlas

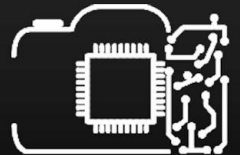


What about the Sensor?



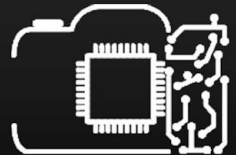
Note that:

- 1080p (1920x1080) = 2.1 megapixels
- 4K (3840 x 2160 or 4096 x 2160) = 8.5 megapixels
- 8K (7680 x 4320 pixels - 4320p) = 33.2



What are the types of Digital Cameras?

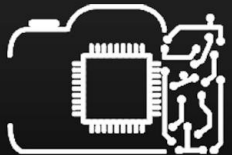
- Compact
- Bridge
- DSLR (*Digital single lens reflex cameras*)
- Mirrorless



Time to **MEET** our cameras!

What is our goal?

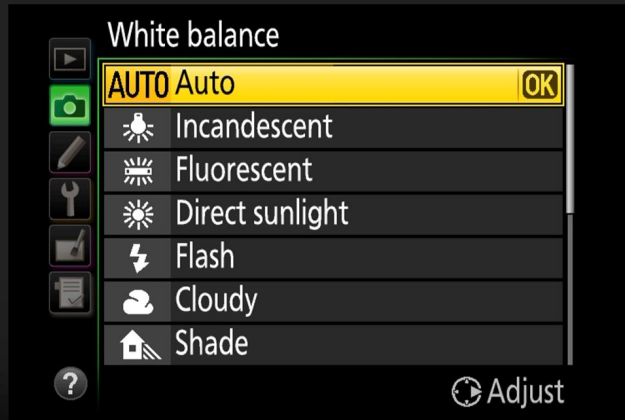
- Became familiar with the **Manual** mode
- Have **Complete** control over our image
- Produce **Consistent** results



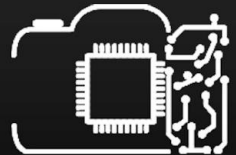
White Balance!

White Balance refers to the **Color Temperature** of our image!

Our goal is to make the picture seem **natural** -> make the whites look white

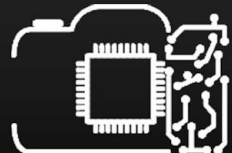
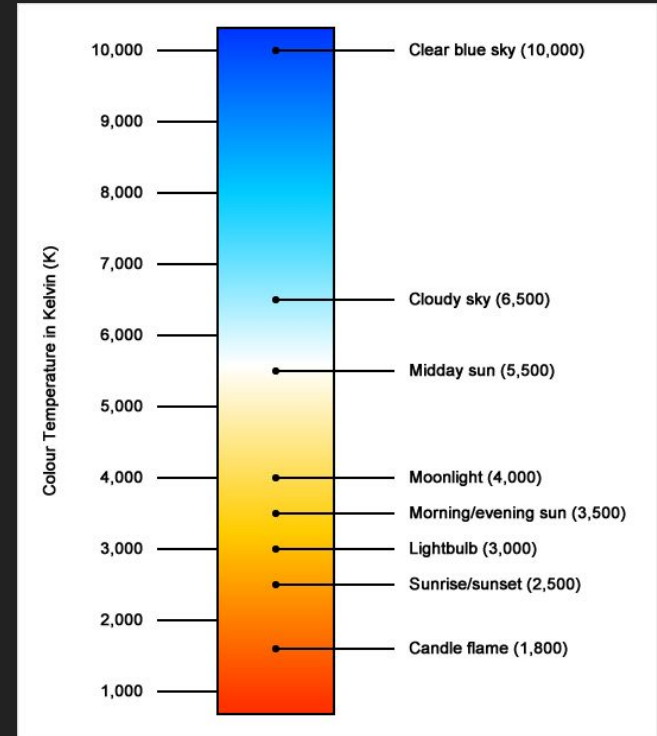
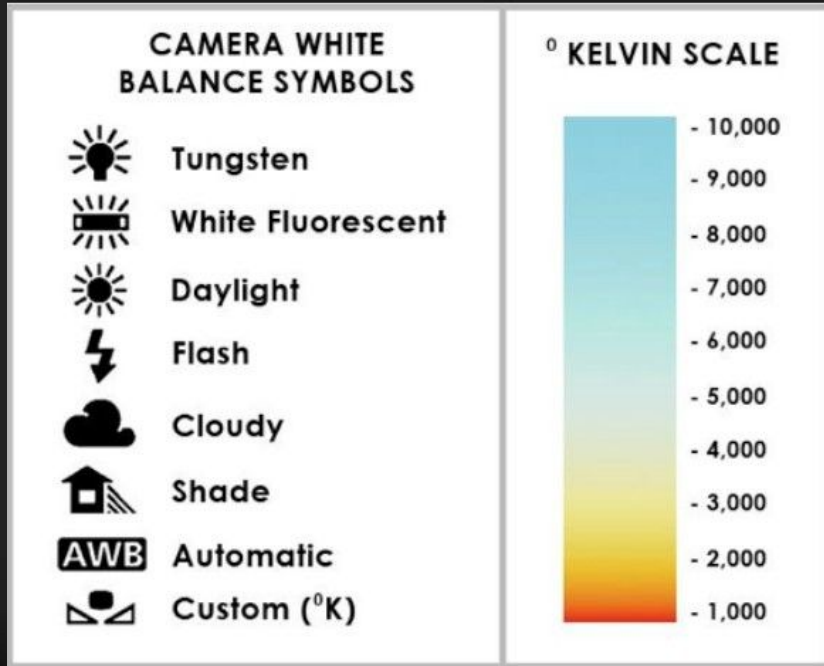


- Normal Light -> Noon sunlight
- Warm Light -> Orange
- Cold Light -> Blue
- Everything is measured in **KELVIN!**



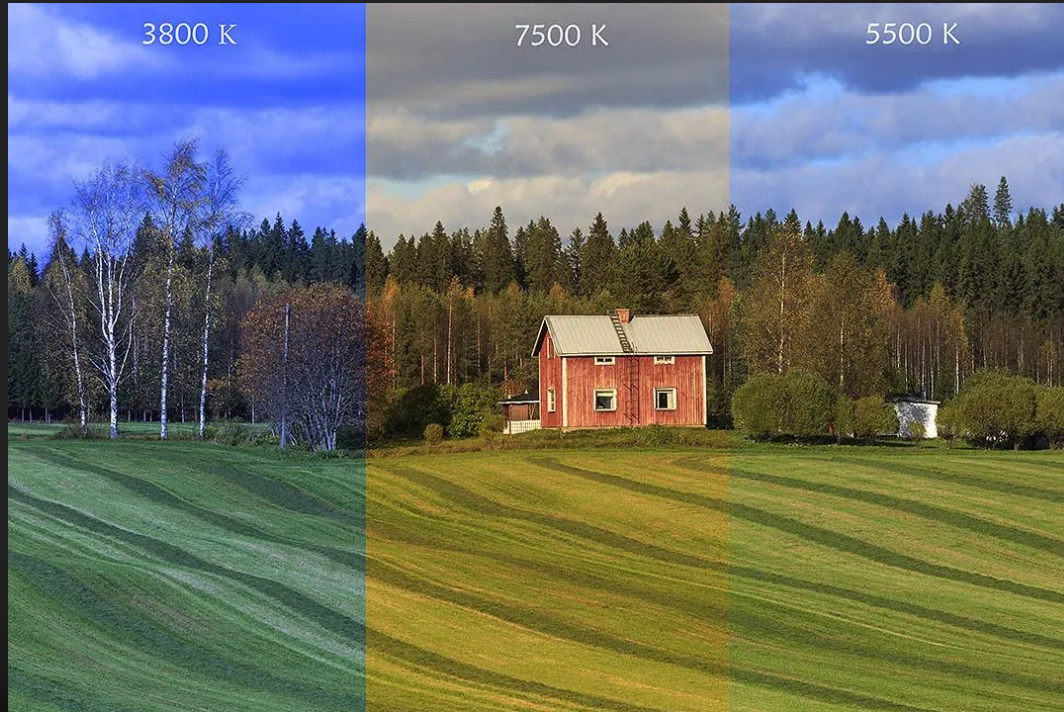
White Balance!

...with examples

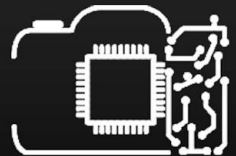


White Balance!

...with examples



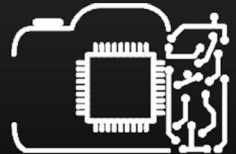
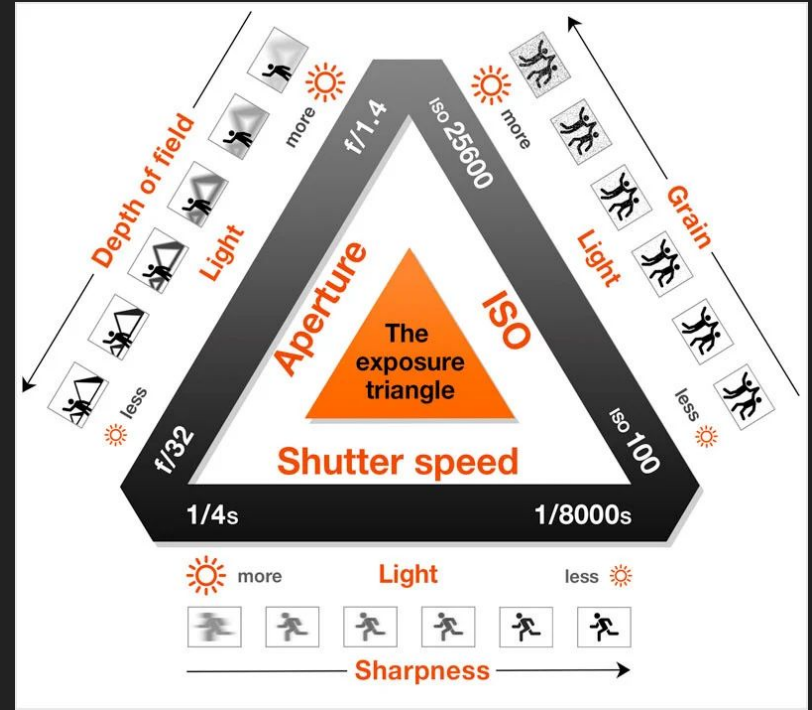
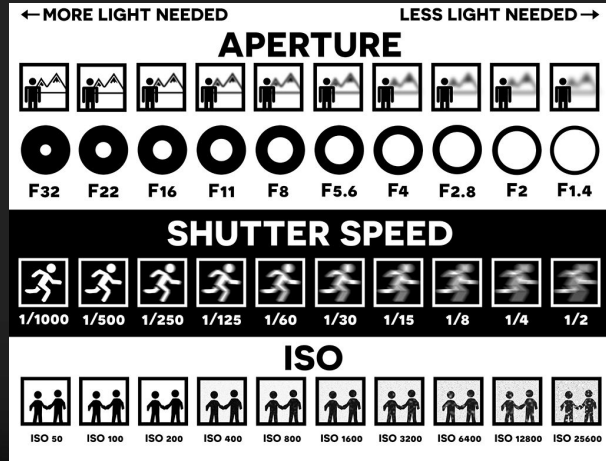
x



What about **exposing** correctly?

Exposure in photography is the result of the values of:

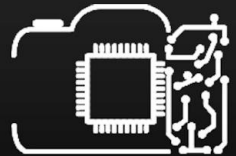
- Aperture
- Shutter Speed
- ISO



What is Shutter Speed?

The **shutter speed** refers to the speed with which the shutter opens and closes, it is therefore the **duration** of the exposure

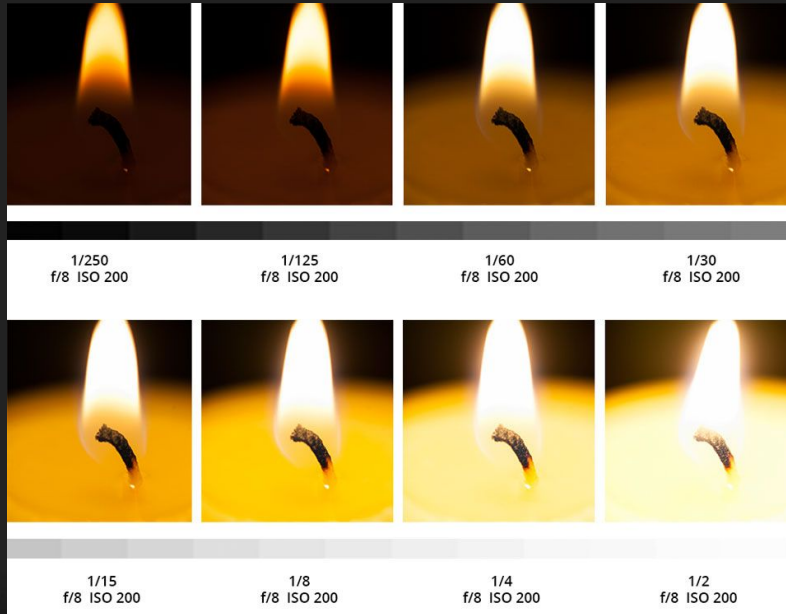
- Short Duration -> **Fast** shutter speed -> **Frozen** Image & Less **light**
- Long Duration -> **Slow** shutter speed -> **Blurry** image & More **light**



x

What is Shutter Speed?

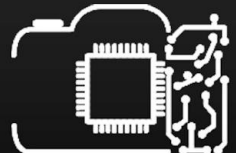
...with examples



SHUTTER SPEED CHEAT SHEET

Bulb	astrophotography, long exposure
5"-30"	light painting, sparklers
1"	fireworks
1/2	night time, little to no light
1/4	blurs motion
1/8	smooth waterfalls, rivers
1/15	low light
1/30	blurring fast motion
1/60	panning images
1/125	portraits
1/250	average situations
1/500	freezing slower subjects
1/1000	freezing faster subjects, sports
1/2000	freezing very quick subjects
1/4000	extreme freeze of action

www.photographygiftshop.com

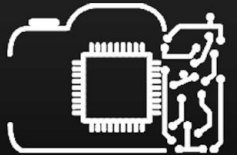


What is Shutter Speed?

...with examples



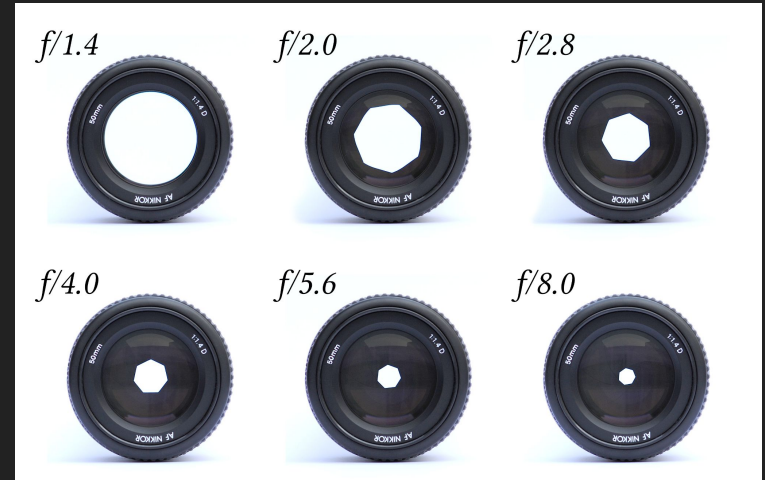
x



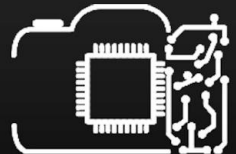
What is Aperture?

Aperture can be defined as the **opening** in a **lens** through which light passes to enter the camera.

In photography, the "**pupil**" of your lens is called aperture. You can **shrink** or **enlarge** the size of the aperture to allow **more** or less light to reach your camera sensor



Aperture can add **dimension** to your photos by controlling **depth of field**. At one extreme, aperture gives you a **blurred** background with a beautiful **shallow focus** effect.

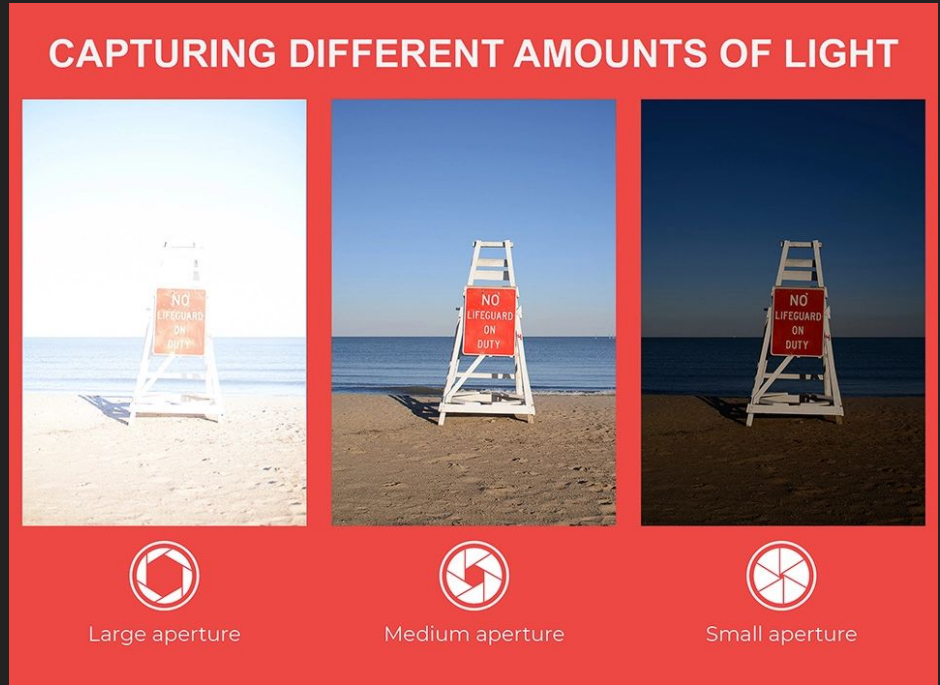


What is Aperture?

...with examples



CAPTURING DIFFERENT AMOUNTS OF LIGHT

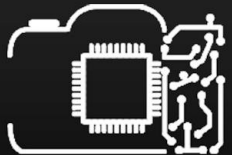


The diagram illustrates how aperture affects the amount of light captured in a photograph. It features three panels, each showing a lifeguard stand on a beach with a "NO LIFEGUARD ON DUTY" sign. The first panel, labeled "Large aperture", shows a very bright scene where the background is washed out. The second panel, labeled "Medium aperture", shows a balanced exposure. The third panel, labeled "Small aperture", shows a dark scene where the background is underexposed. Below each panel is a circular icon representing the aperture size: a large opening for large aperture, a medium opening for medium aperture, and a small opening for small aperture.

Large aperture











Medium aperture










Small aperture

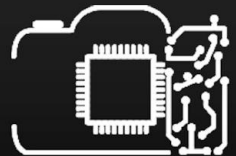


What is Aperture?

...with examples

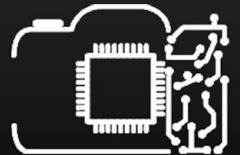
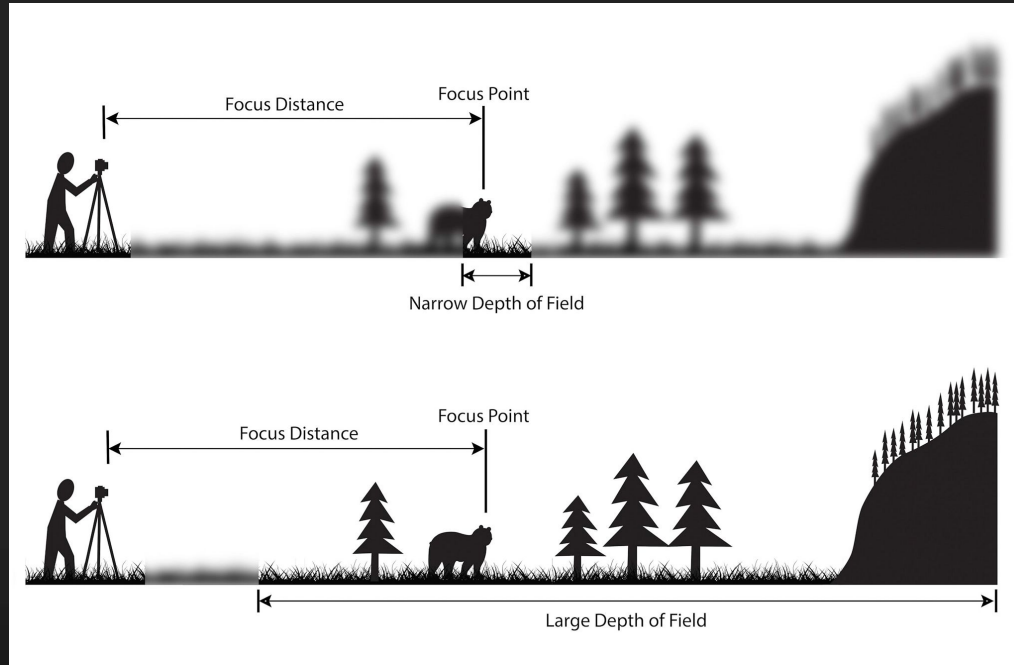
				
f/1.4	f/2.8	f/5.6	f/11	f/22
Very Large Aperture	Large Aperture	Medium Aperture	Small Aperture	Very Small Aperture
Very Small Depth of Field	Small Depth of Field	Medium Depth of Field	Large Depth of Field	Very Large Depth of Field
Almost Nothing In Focus	Little In Focus	Some In Focus	Much in Focus	Almost All In Focus
				
Brightest	Bright	Medium	Dark	Darkest

 ● F22	 ● F16	 ● F11
 ● F8	 ● F5.6	 ● F4
 ○ F2.8	 ○ F2	 ○ F1.4



What is Aperture?

...with examples

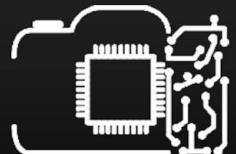


What is ISO?

ISO refers to *your camera's sensitivity to light*. The **higher** the ISO, the **more sensitive** your camera sensor becomes, and the **brighter** your photos appear.

While ISO is mostly discussed in a digital context, **film** cameras use ISO, as well







High ISO -> Brighter Image **BUT**
High ISO -> Grain in the image
-> Color fringes

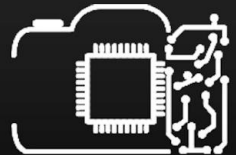


What is ISO?

...with examples



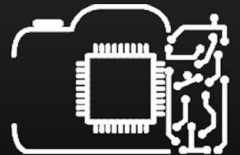
ISO 100-200  Daylight	ISO 200-400  Shade/ Indoors
ISO 400-800  Flash Indoors	ISO 800-1600  Darker Indoors
ISO 1600-3200  Indoors at Night	ISO 3200+  Extra Low Light



Meeting the **Modes!**

They offer an easy way to use one of the three pillars of photography! They are a **stepping stone** (?!) to **MANUAL**

- Manual
- **Aperture Priority**
- **Shutter Priority**
- Program

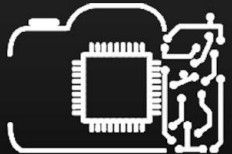


Let's take it from the top: Meet the **Program Mode**

You only need to "ask" for the exposure you want (like the slider in your phones)

This is done by using the **Exposure Compensation** dial in your cameras

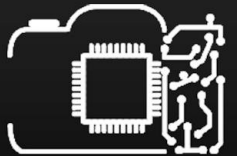
Feel free to control the Flash, ISO and White Balance



Let's turn it up a notch:
Meet the **Shutter Priority Mode**

You now "ask" for the exposure and the shutter speed you want!

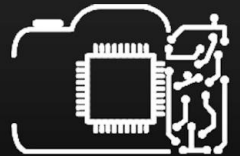
Suitable for when Shutter Speed is crucial but you need to be ready to shoot in changing circumstances (*sports events, wildlife photography*)



You're nearly there:
Meet the **Aperture Priority Mode**

You now "ask" for the exposure and the aperture you want!

Suitable for when Aperture (Depth of Field) is crucial but you need to be ready to shoot in changing circumstances (*Portraits, Macro*)



But my photos are **blurry!**

Let's **Focus**




When using Auto Focus, your camera uses an AF Mode. According to the circumstances of your photoshoot, you may need to utilize **focus tracking**, disable it or leave it to the camera!

Focus Modes:

- AF-S
- AF-C
- AF-A
- Manual



UNDERSTANDING CAMERA AUTOFOCUS MODES (AF)

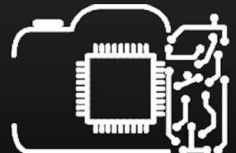
AF MODES	HOW IT WORKS	WHEN TO USE IT
AUTOFOCUS SINGLE (AF-S / ONE-SHOT AF)	<ul style="list-style-type: none">It is the most basic AF optionYour camera will lock the focus on the subject that you want to photographIf your subject moves, you'll have to focus again.	Best AF mode for static subjects: <ul style="list-style-type: none">LandscapeStill PortraitsArchitecture 
AUTOFOCUS CONTINUOUS (AF-C / AI SERVO)	<ul style="list-style-type: none">It's a more advanced Autofocus ModeYour camera will continue to track the subject even if it moves around the frameThe efficiency of this mode depends on many factors like the subject's movements, the light conditions, camera technology, etc.	Best AF mode for moving subjects: <ul style="list-style-type: none">WildlifeSports & Action 
AUTOMATIC AUTOFOCUS (Hybrid Autofocus / AF-A / AI-FOCUS AF)	<ul style="list-style-type: none">Combination between Single & Continuous AF modes.Your camera will switch between both modes depending on the movement of the subject	Best AF mode for unpredictable/erratic subjects: <ul style="list-style-type: none">WildlifeChildrenStreet photography & Events 

Each camera manufacturer uses different nomenclature for the same Autofocus Modes. Check your camera manual to see your camera Autofocus names.

capturetheatlas.com



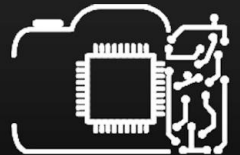
[@Capturetheatlas](https://www.facebook.com/capturetheatlas)



Let's **Focus!**

...with examples

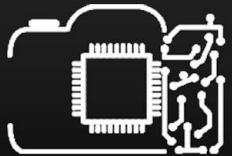
When to use AF-S



Let's **Focus!**

...with examples

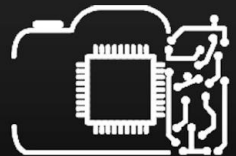
When to use AF-C



Let's **Focus!**

...with examples

When to use Manual



Is there something called **Focus Points?**

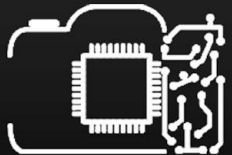
Different numbers of Focus Points,
are more suitable for different
scenes:

Example from a DSLR's manual:

*The **9-point option** is recommended if you want to focus on a specific subject in the frame, such as a single athlete in a group of players, or the eyes of your model in a portrait.*

*Alternatively, a **25-point** dynamic-area AF tracks a wider area in your frame; for instance, a figure skater executing a move.*

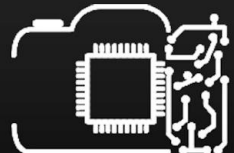
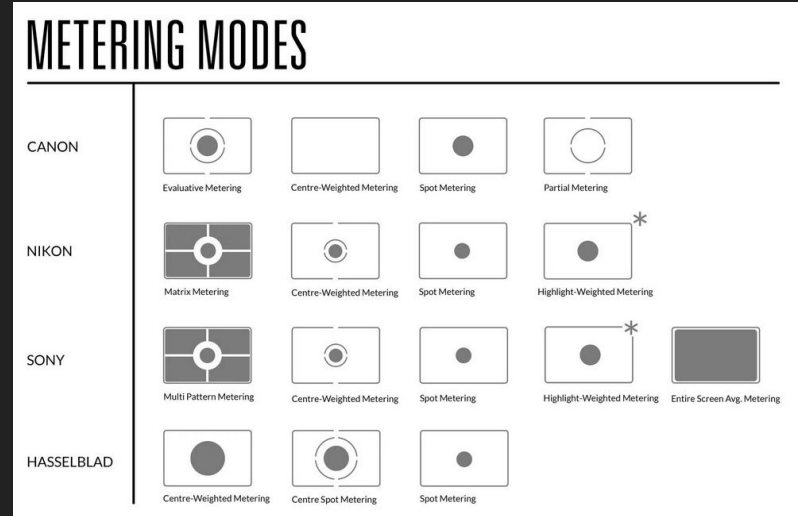
*A **51-** or **72-point** dynamic-area AF may be preferred if a background contains objects with regular, detailed patterns, like a billboard or the stands.*



My **exposure** is different than expected!

Your camera has various ways to determine the exposure, called **Metering Modes!**

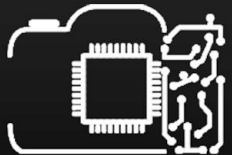
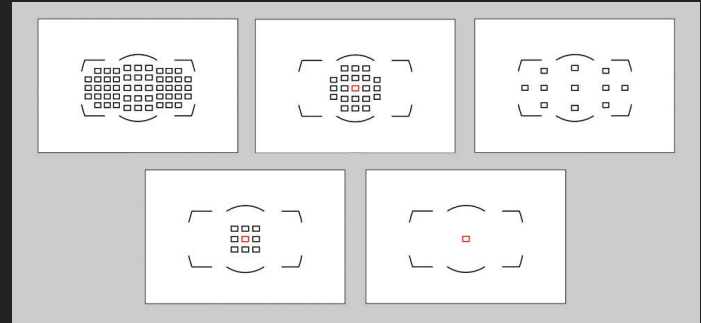
- Matrix/ Evaluative Metering
- Center-Weighted Metering
- Partial Metering
- Spot Metering



I need more **Light!**

Sometimes using **Flash** is necessary! Intensity is control via Flash Compensation or via manual settings.

- Fill Flash
- Slow Sync
- Rear-Curtain Sync



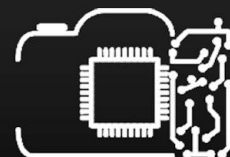
Know your **Flash!**

...with some examples

Fill Flash



x



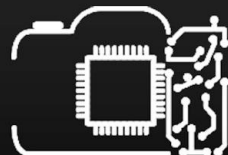
Know your **Flash!**

...with some examples

Slow Sync Flash



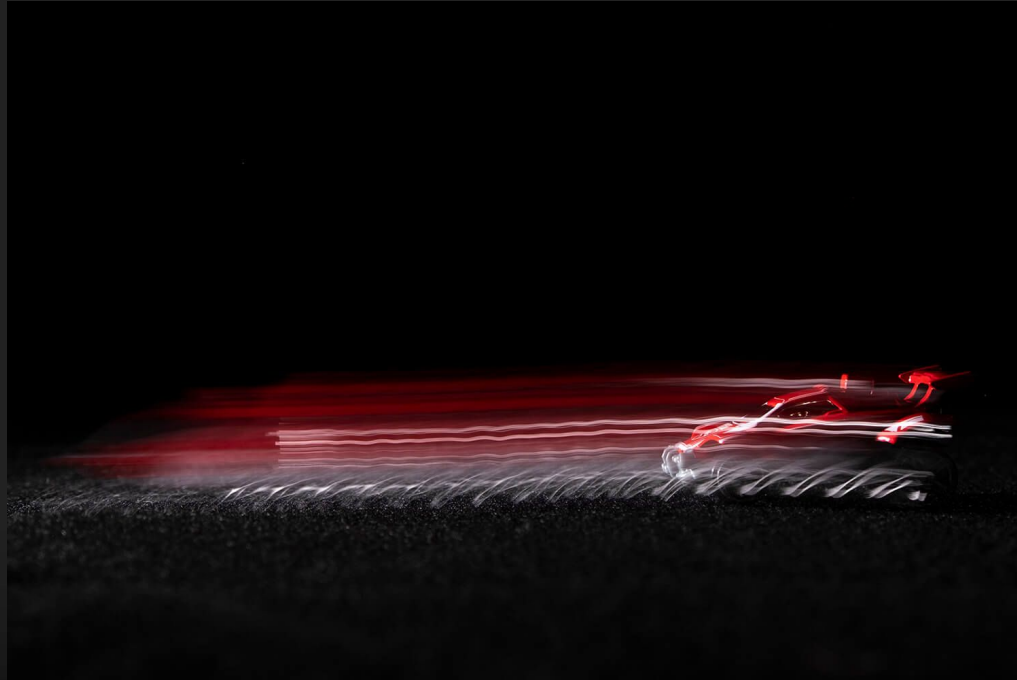
+



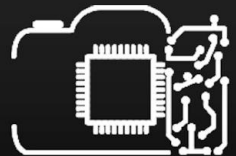
Know your **Flash!**

...with some examples

Rear-Curtain Flash



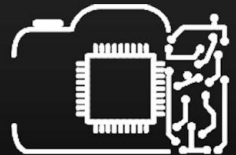
x



Get the most out of your camera!

AE-Lock/ AF-Lock

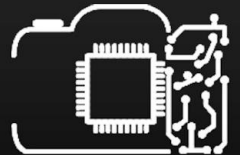
Exposure and/or Focus stay the same while pressing the "Lock" button



Get the most out of your camera!

Bracketing!

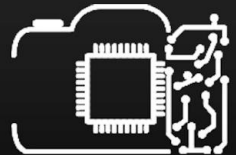
- Take multiple shots with slightly different exposures
- Create **HDR** images
- Create **Double Exposure** images
- If you have 3 exposures, at least one will be useable (film days)



...the eternal debate (?!)

RAW vs JPEG

Just ... shoot RAW



THANK YOU !!

x

