

Aperture, Shutter speed and iso

These are the building blocks of good photography and making good choices on the combination of these 3 controls will give superior results than you will get by using the camera on Program or Auto.

Shutter speed

- Shutter speed refers to the amount of time the shutter remains open to capture the image, so to freeze an image in motion it would not be uncommon to use a speed of $1/1000^{\text{th}}$ of a second or faster (some cameras go as fast as $1/8000^{\text{th}}$ sec!), Alternately some images made at night with a tripod can be several hours long.
- If handholding try not to use a speed below $1/60^{\text{th}}$ sec. Longer lenses need faster speeds to obtain a sharp image, i.e. 200mm lens use $1/250^{\text{th}}$.

Fast shutter speed ie 1/2000th



Aperture

- Aperture or F Stop controls the amount of light coming in through the lens by opening or closing a diaphragm in the lens.
- The F stop you choose also has a direct influence on what is known as “Depth of Field”, this is the distance an image remains sharp from front to back, a small F stop i.e. a higher number say F22 will give greater depth of field (more sharpness) this is useful when trying to show all the detail of objects that have some depth, the greater the number the more closed the diaphragm is.
- A more open F stop i.e. F2.8 lets in more light but gives a shallower depth of field, this is useful when light levels are low or if you are wanting to throw areas of a photo out of focus, this can help direct people's attention to a certain part of the photo and distract from the background by throwing it out of focus.
- Think of it like a tap, the more open the diaphragm the more light can get through.

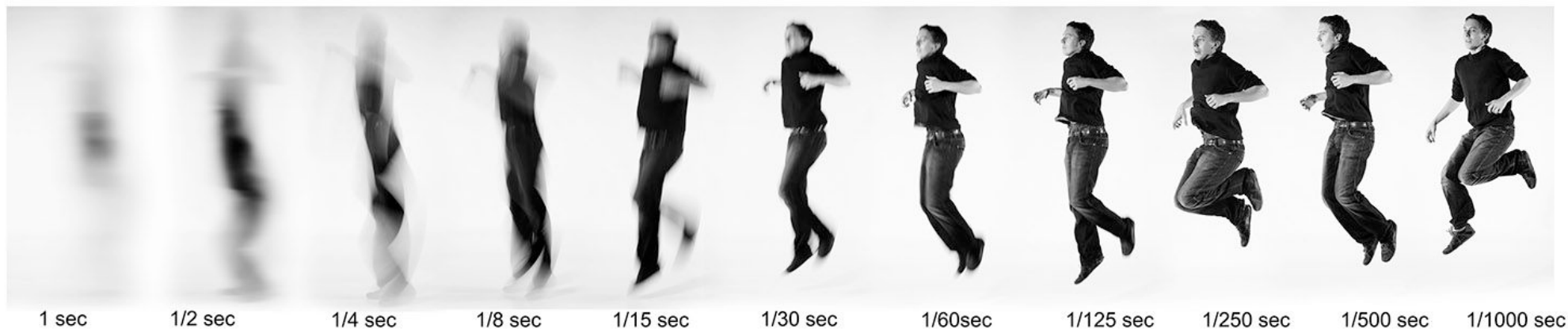
Shallow depth of field ie F2.8



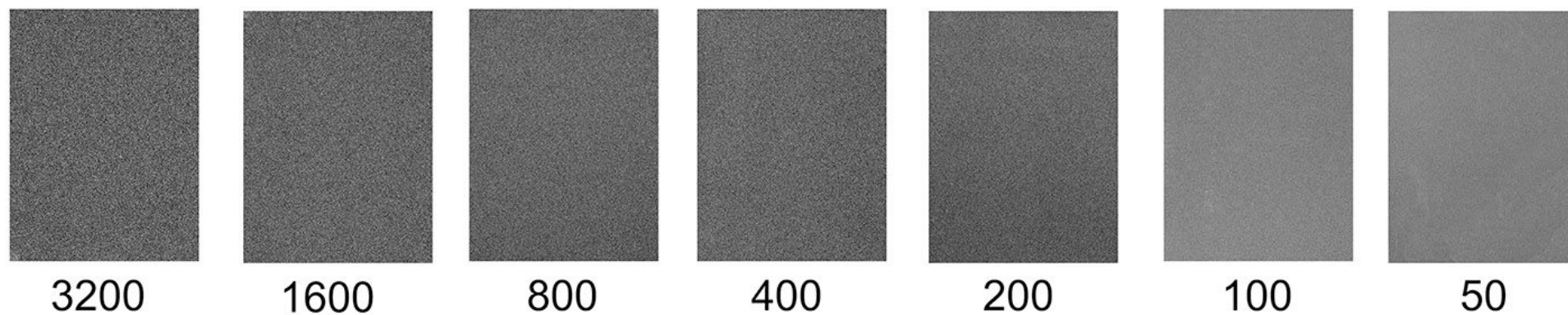
ISO or Gain/Film speed

- Refers to the sensitivity of the film or chip to light, the higher the number the more sensitive, the down side to this is that the faster (higher) the iso the more “Noise” or in the case of film “Grain” there will be in the image.
- Higher ISO is good when handholding the camera in low light or when fast shutter speeds are needed (sports).
- A lower ISO is best when photographing using a tripod or when quality is an issue.

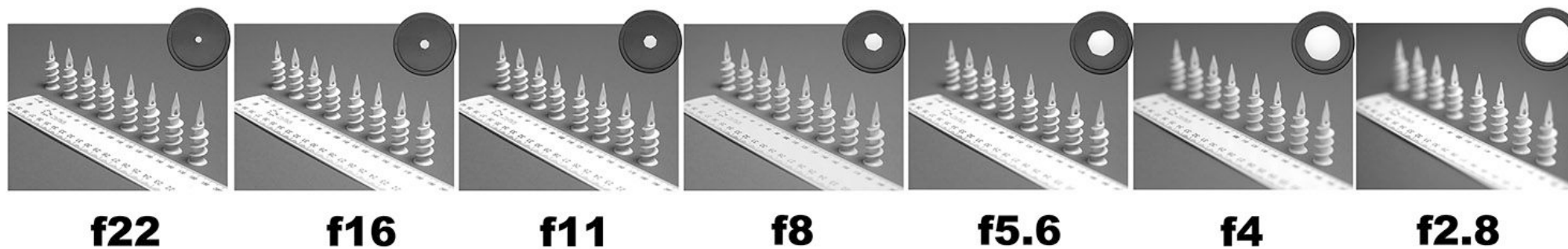
Shutter Speed (capturing time)



ISO (CCD Sensitivity and clarity of image)



Aperture (controls quantity/ intensity of light)



What is White Balance?

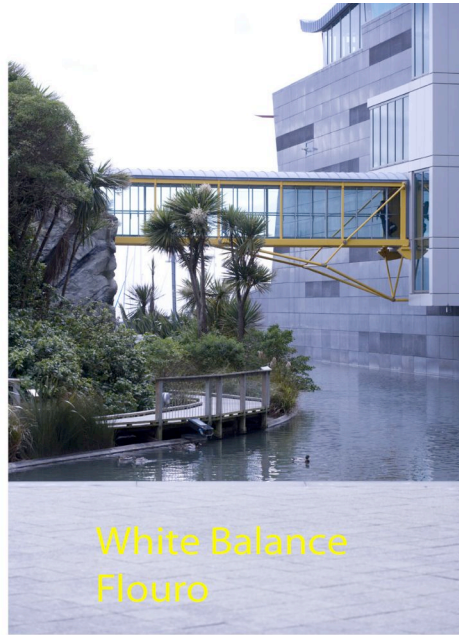
- White balance (WB) is the process of removing unrealistic color casts, so that objects which appear white in person are rendered white in your photo. Proper camera white balance has to take into account the "color temperature" of a light source, which refers to the relative warmth or coolness of white light. Our eyes are very good at judging what is white under different light sources, however digital cameras often have great difficulty with auto white balance (AWB).

White Balance 2

- An incorrect WB can create unsightly blue, orange, or even green color casts, which are unrealistic and particularly damaging to portraits. Performing WB in traditional film photography requires attaching a different cast-removing filter for each lighting condition, whereas with digital this is no longer required. Understanding digital white balance can help you avoid color casts created by your camera's AWB, thereby improving your photos under a wider range of lighting conditions.



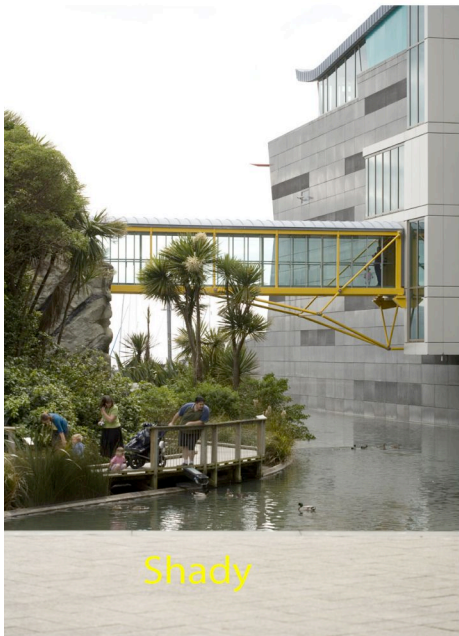
White Balance
Tungsten



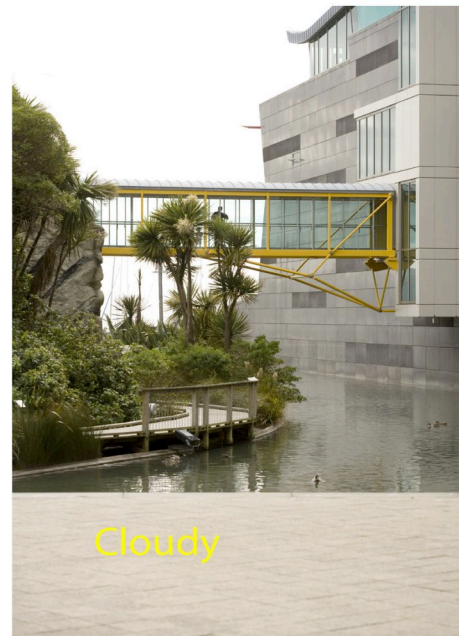
White Balance
Flouro



AWB



Shady












Cloudy



Custom WB

Increasing Color Temperature ↓

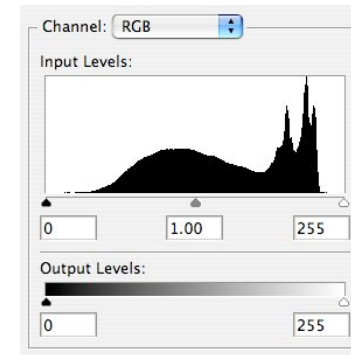
	Auto White Balance
	Custom
	Kelvin
	Tungsten
	Fluorescent
	Daylight
	Flash
	Cloudy
	Shade

Example of Tungsten setting

notice the clean whites and how the tungsten setting has created a neutral colour balance



Histograms



- Understanding image histograms is probably the single most important concept to become familiar with when working with pictures from a digital camera. A histogram can tell you whether or not your image has been properly exposed, whether the lighting is harsh or flat, and what adjustments will work best. It will not only improve your skills on the computer, but as a photographer as well.

Histograms 2

- Each pixel in an image has a color which has been produced by some combination of the primary colors red, green, and blue (RGB). Each of these colors can have a brightness value ranging from 0 to 255 for a digital image with a [bit depth](#) of 8-bits. A RGB histogram results when the computer scans through each of these RGB brightness values and counts how many are at each level from 0 through 255.

Histograms 3

- The region where most of the brightness values are present is called the "tonal range." Tonal range can vary drastically from image to image, so developing an intuition for how numbers map to actual brightness values is often critical—both before and after the photo has been taken.
- There is no one "ideal histogram" which all images should try to mimic; histograms should merely be representative of the tonal range in the scene and what the photographer wishes to convey.

Overexposure



Underexposure

ISO 100 Linear response (As shot)

EC: 0,0 EV
CC: 0
Sat: 0

Channel: RGB

Levels Curve

0 1.00 255

Custom target colors

Preserve color balance

Phase One RAW	Destination
153	162
148	160
139	152



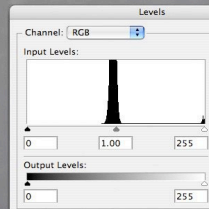
Good exposure



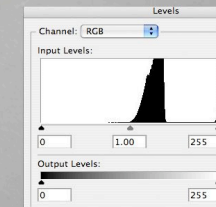
Exposure

- A good rule of thumb is that you will need to manually adjust the exposure whenever you want the average brightness in your image to appear brighter or darker than the midtones.
- Remember a camera on Auto will average the brightness of what it “see’s”, if what the camera averages is very dark or very bright you will get a wrong exposure.

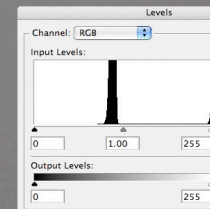
F5@3.2sec 400iso
Auto
Black



F5@1/13th sec 400iso
Auto
Grey

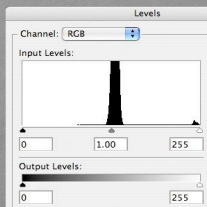


F5@1/80th sec 400iso
Auto
White

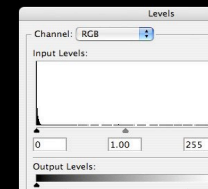


Camera set to auto, photographs of very dark, mid grey and white pieces of card, notice the different exposures it has chosen even though the light levels have remained constant.

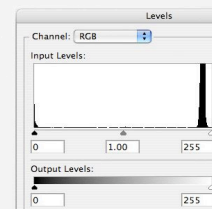
1/15sec@F5.6 400iso
Manual



1/15sec@F5.6 400iso
Manual



1/15sec@F5.6 400iso
Manual



Camera on manual, accurate exposures of all three cards.