

MOVING IMAGE - CAMERA BASICS



DSLR BASICS

BRIEF HISTORY

Released in 2008 The Nikon D90 and the Canon 5D Mark II were the first major DSLRs to have HD video functionality. Canon added video capability as an afterthought to the stills camera for journalists and photographers to shoot short supplementary clips for online use.

Independent filmmakers and artists started using these cameras as they were relatively affordable and the ability to change lenses allowed for the use of more cinematic techniques in their work. This helped push the popularity of sites such as Vimeo that created online hubs of filmmaker communities.

USEFUL INFO

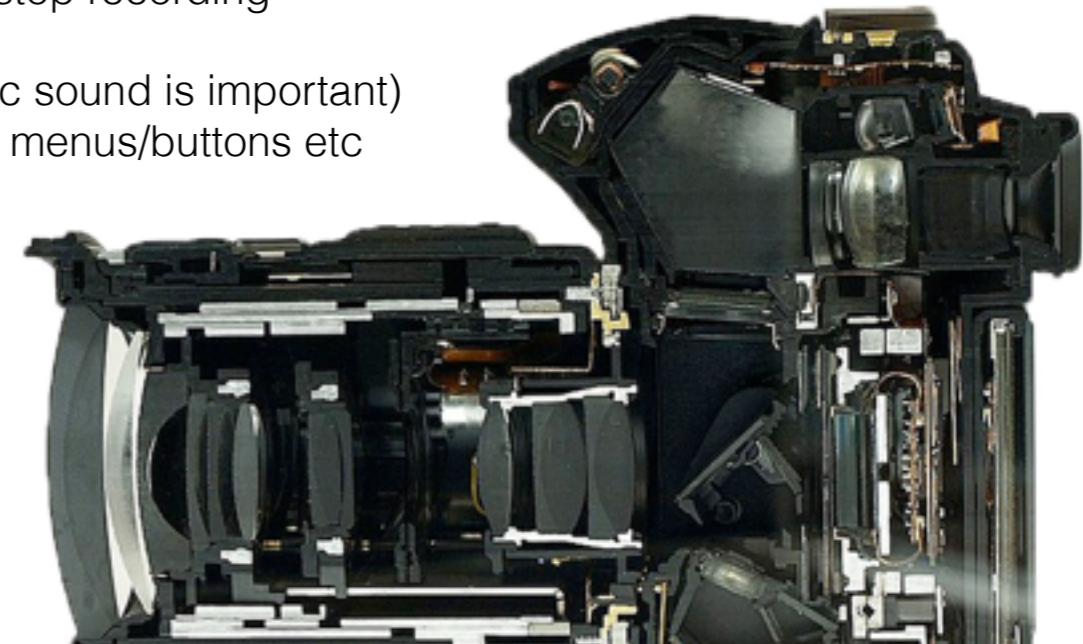
- A 16Gb card holds approx. 40 minutes of full resolution footage.
- A standard Canon LP-E6 battery lasts for approx. 90 minutes & takes approx. 90 minutes to charge.

DSLR PROS

- DSLRs produce a 'filmic' look. Interchangeable lenses.
- Shallow depth of field.
- Light and portable.
- Good in low light conditions. Produces a 'cleaner' image than video cameras.

DSLR CONS

- Not really suitable for prolonged takes. SD cards usually hit a 4GB limit and stop recording (about 12 minutes total depending on the footage.)
- Poor built in microphone (use an external audio device or plug in mic if sync sound is important)
- Primarily a stills camera. Not designed for handheld film work. Lots of extra menus/buttons etc that you often don't 'need' as a film maker.
- Auto focus inaccurate and slow compared to video cameras.
- Often a lack video camera functionality i.e focus/zebra assist.
- Rolling Shutter & Moire on some cameras.



FILE/RECORDING SETTINGS (1920 X 1080 & FRAME RATES)

Different cameras have different file/recording settings to choose from, the most common are:

1280 x 720 - HD “Ready” (1280 x 720 pixels)

1920 x 1080 - High definition/Full HD video

3840 x 2160 - UHD “Ultra HD”

4096 x 2160 - 4K RAW (Note: Using raw image files to shoot, most computers will struggle to edit 4K files!)

PAL is the video standard used in the UK and other countries - it records and plays back at 25fps

NTSC is the video standard used in US and other countries - it records and plays back at 30fps

You would usually use PAL 1920 x 1080 25fps on most projects.

Always check you have set the right movie record setting before filming!



SLOW MOTION

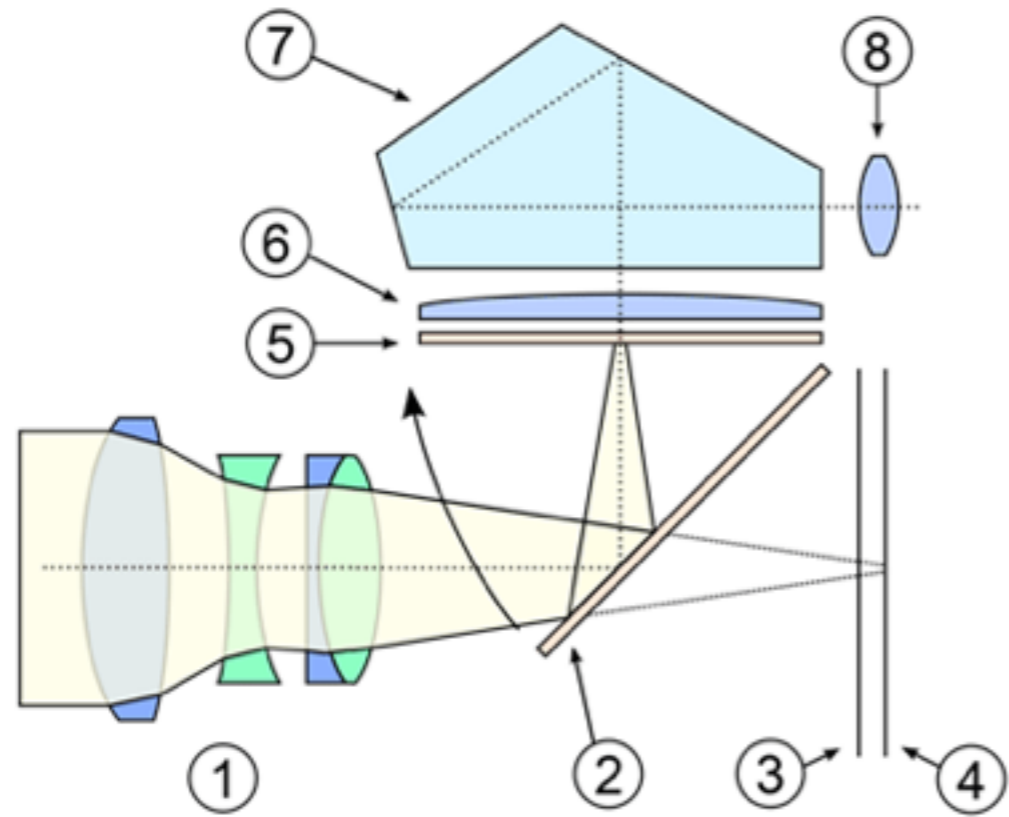
Most cameras will crop the image when shooting slow motion.

DSLR: To get a few more frames out of your slow motion change the standard to NTSC and Movie rec. size to 1280x720 60fps. You'll now shoot at 60fps instead of 50!

*There is also a setting for 24fps on DSLRs. This is intended for a “filmic” look, but does not look like film!

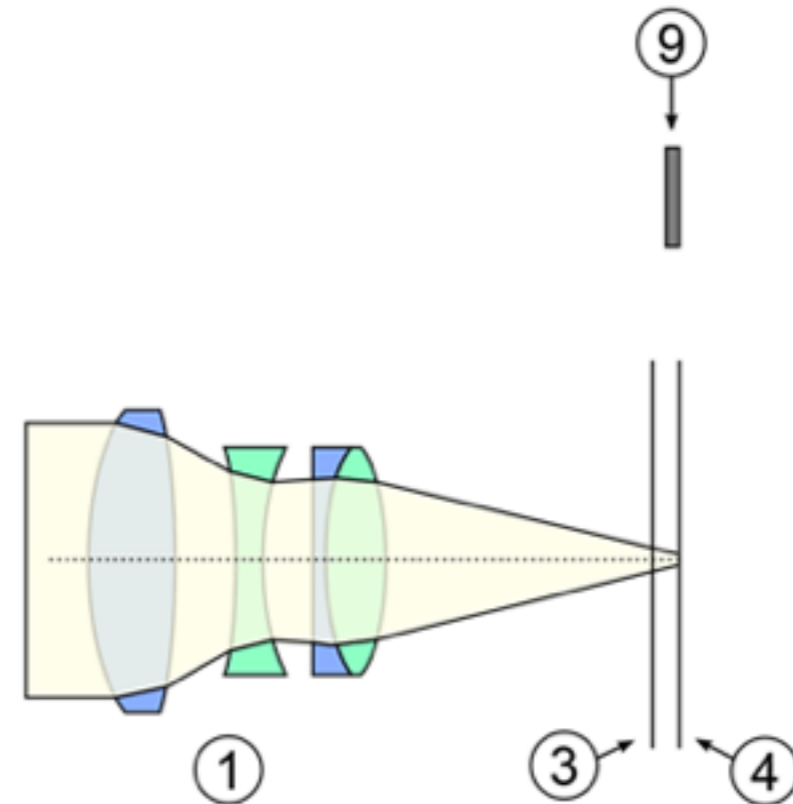
CAMERA DIAGRAM

DSLR Camera



- ① Lens
- ② Reflex Mirror
- ③ Shutter
- ④ Image Sensor
- ⑤ Focusing Screen
- ⑥ Condenser Lens

Mirrorless Camera



- ⑦ Pentaprism
- ⑧ Optical Viewfinder
- ⑨ Electronic Viewfinder

When shooting video on a DSLR camera the mirror flips up and stays up to allow light to continuously pass onto the sensor.

This is why on DSLR cameras you can only use the digital screen (or 'Live View') at the back whilst filming. Most digital filmmaking cameras operate without a mirror and the sensor is exposed to light at all times.

CAMERA SENSOR SIZES

A sensor is in effect the camera's 'brain', processing the image that passes through the lens.

Generally, a larger sensor performs better in low light conditions and can take advantage of a lens' field of view (more about that in the next workshop).

Larger sensors require a larger camera body to house them.

SENSOR SIZES & FILM FORMATS

Measurements are in mm width x height

"D" = Diagonal in mm of sensor or film area (same as diameter of image circle needed to cover it)

Number of Pixels on horizontal axis represented in Ks (HD = 1920 x 1080)



EXPOSURE

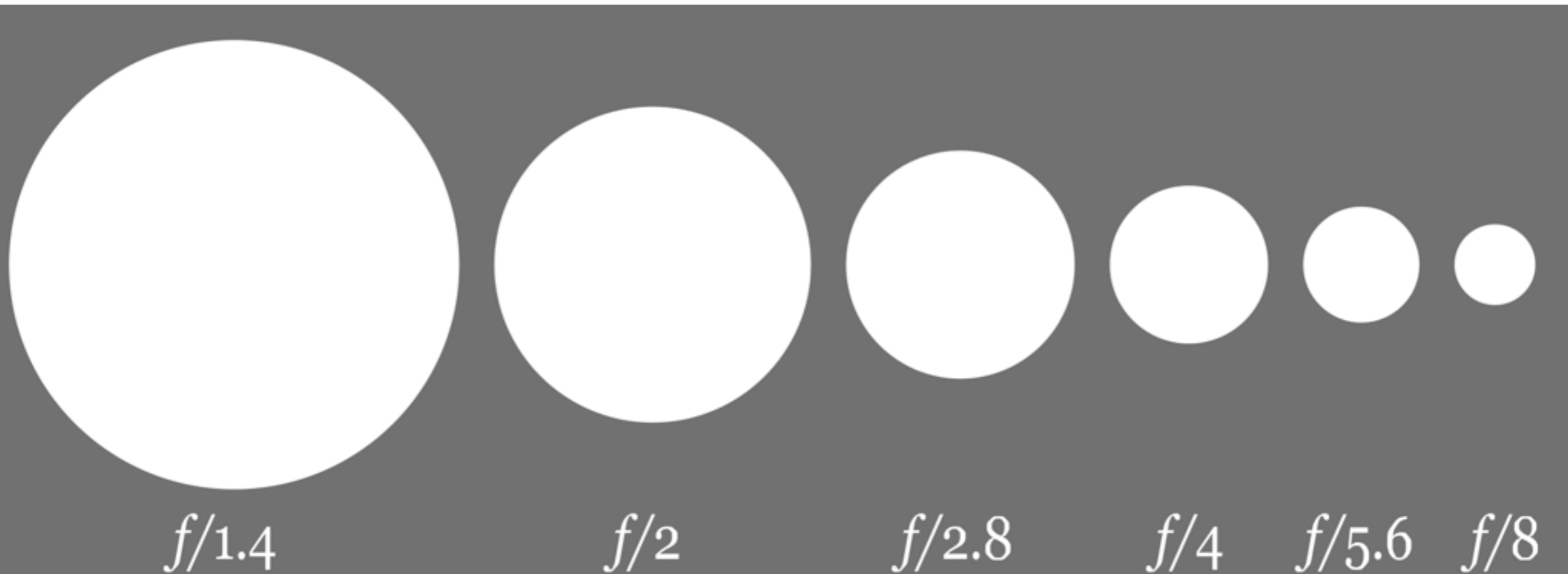
Exposure is the unit of measurement for the total amount of light permitted to reach the electronic sensor during the process of taking a photograph or filming.

Electronic lenses - Exposure is controlled either digitally in the camera menu system or automatically if the camera is on AUTO setting.

Manual Lenses - The exposure is controlled by turning the exposure ring on the lens itself - the lens does not communicate electronically with the camera.

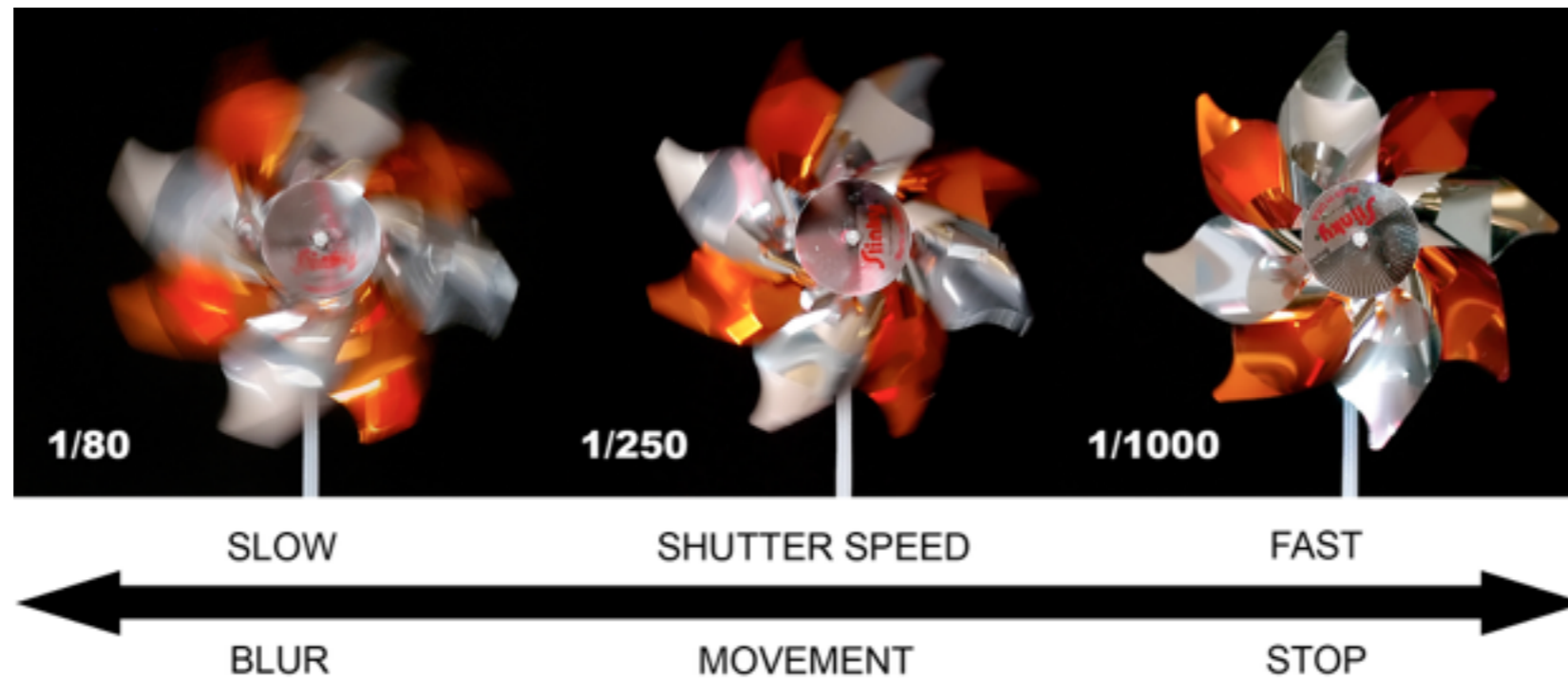
F- STOP relates to a lens aperture (or iris) opening or shutting, therefore letting more or less light into the camera. Confusingly, the lower f-stop number, the more light enters the lens.

‘Faster’ lenses can be opened to a lower f-stop and therefore work better in lower light.
i.e a Canon EF 14mm f/2.8 lens will open up to f/2.8.



SHUTTER SPEED

the nominal time for which a shutter is open, exposing the film (or sensor) to light.



In stills photography a very fast shutter speed (i.e. 1/1000) freeze-frames movement.
A slow shutter speed creates a 'blurred' image.

In film making shutter speeds alters how movement is perceived.

A slower shutter speed creates a brighter image and blurs motion.

A very fast shutter speed darkens the image and creates more movement 'definition' - an almost 'sped up' look (i.e 'Saving Private Ryan', 'Gladiator' etc.)

Film makers often set their shutter speed to twice their frame rate for 'natural' movement (i.e. 25fps = 1/50 shutter speed)

ISO

In traditional (film) photography ISO (or ASA) is the indication of how sensitive a film is to light.

ISO is measured in numbers – 100, 200, 400, 800 etc).

The lower the number the lower the sensitivity of the film and the finer the grain in the shots you're taking.

In Digital Photography ISO measures the sensitivity of the image sensor.

ISO is very important as it controls the amount of 'grain' in your image.

A low ISO (i.e ISO 100) will create a less noisy, 'cleaner' image.

The higher the ISO the lighter your image will become, however, the image will also become 'noisier' with noticeable grain and pixellation.

A larger camera sensor and faster lens contribute towards being able to shoot with less light and therefore ramp up the ISO without the image becoming too noisy.

FINDING THE CORRECT ISO

- 1/ Dial down the ISO as low as possible
- 2/ Too dark? Open up the aperture.
- 3/ Dial the ISO up until the image is right & with a clean image
- 4/ Still too dark? Try pushing up the shutter speed up slightly



WHITE BALANCE

White balance refers to how the camera reads the colour temperature of the light.

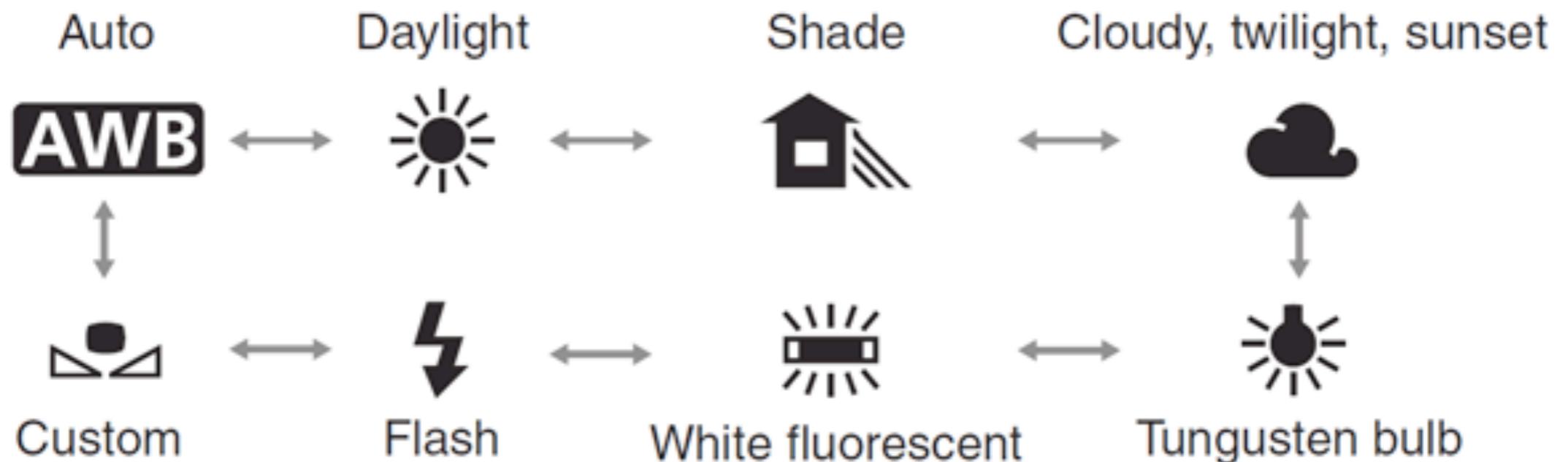
Different lighting has different colour temperatures. These are measured in *Kelvins* (K). Lights below 4000K appears reddish while lights above 7000K appear blueish.

To correct a DSLRs White Balance use the White Balance menu and adjust to the lighting you are using (i.e. Fluorescent, Daylight).

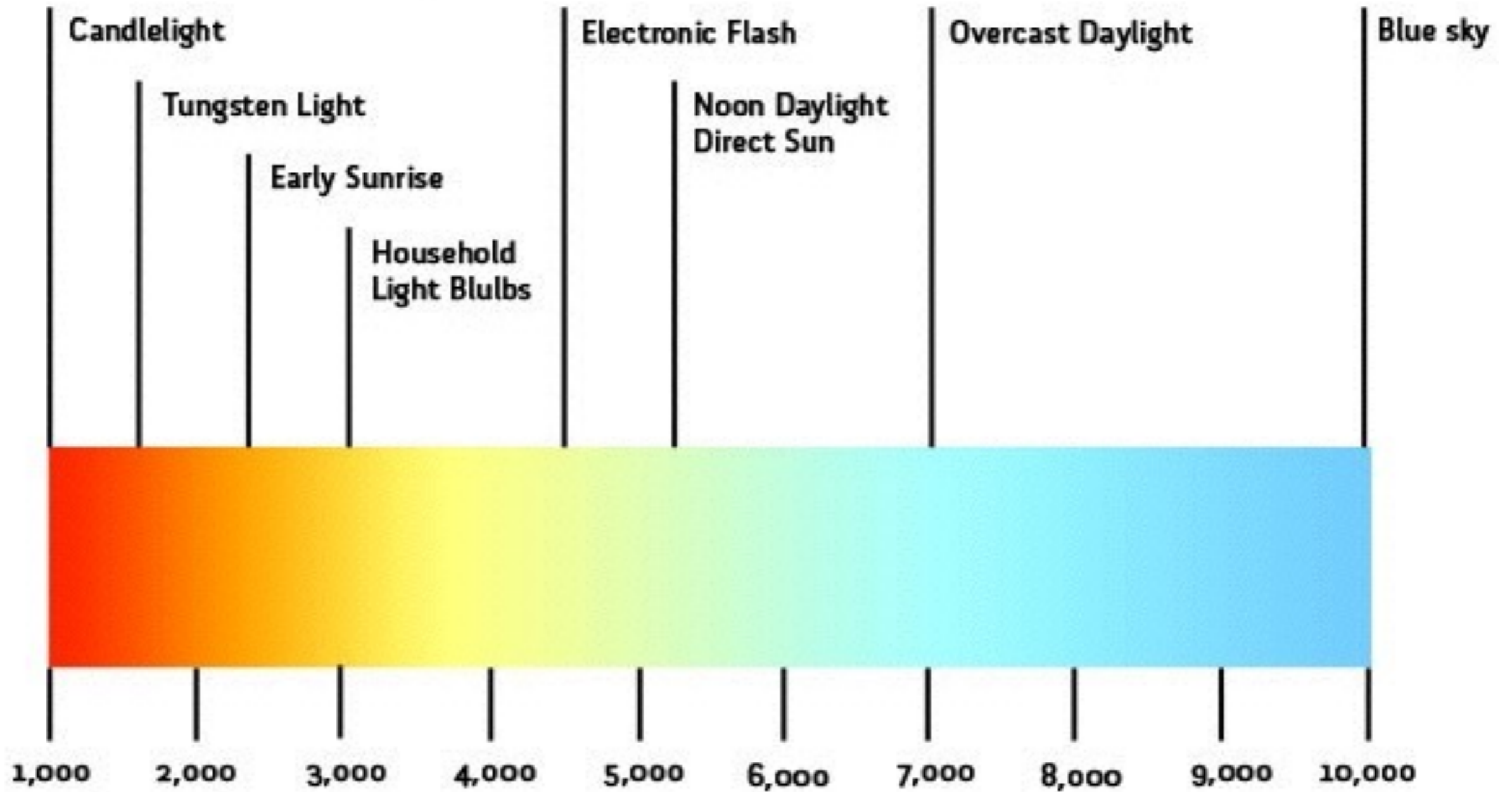
If the White Balance still seems wrong to the eye set:

MANUAL WHITE BALANCE

- 1/ Make sure White Balance is set to 'AUTO'
- 2/ Frame a piece of white paper, card etc in front of the lens and take a still
- 3/ Set White Balance to 'CUSTOM'
- 4/ Choose the image you have just taken as your custom white balance



Colour Temperature - Kelvin



FOCUS

*the focal length of a lens; the distance from a focal point to a corresponding principal plane/
the clear and sharply defined condition of an image.*

The focus is controlled by a ring on the lens or sometimes on electronic lenses, an auto-focus option. It's good practise to use manual focus on the lens at all times to avoid unintentionally focusing on the wrong subject or area within the frame.

DSLRs have an Auto-Focus option. Although this can be useful for stills photography (as you are selecting the focus from a split second in time) in Moving Image work the frame or the action within it is (usually) constantly moving. Auto Focus can be slow and may cause a focus 'hunting' in the frame.

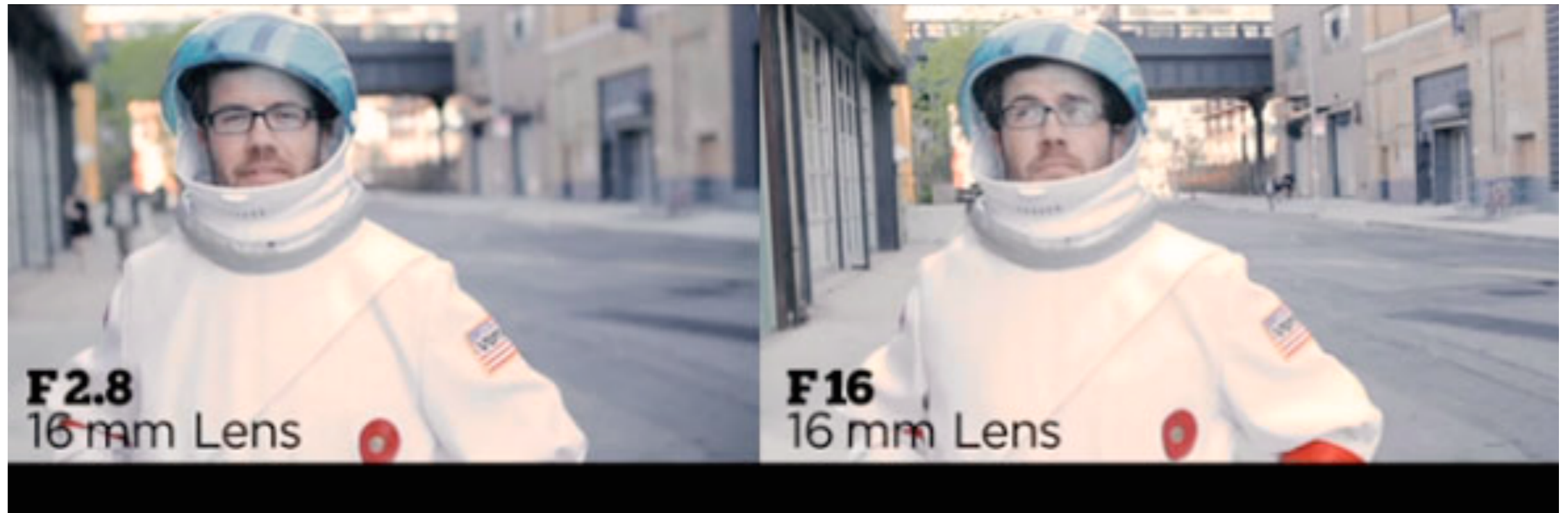
To focus up a static shot, zoom in as far as possible to your subject, manually make sure the focus is sharp and then zoom out again. This should ensure the entire shot is in focus. However you should not manually zoom in via the lens, as when zooming out again you may knock your shot slightly out of focus/position. Most cameras will have a button/menu option to zoom in for focusing. On a DSLR it is a magnifying glass icon.

NOTE: A Shallow Depth DOF can be difficult to follow and focus in on as the point of focus will be narrower.



DEPTH OF FIELD

Also called focus range or effective focus range, is the distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image



Shallow Depth of Field

Deep Depth of Field

DOF directly relates to the amount of light passing through the lens. The lower your f stop (and the more light entering the lens) the shallower your depth of field will be.

In general to create a deep DOF you'll need lots of light to stop the lens down and still see an image. We will cover lenses and DOF in more detail during the next workshop.

<https://vimeo.com/blog/post/behind-the-glass-part-3-depth-of-field>

COLOUR PROFILES - PICTURE STYLES

Most cameras designed to shoot cinematic moving image such as Blackmagic and Arri, will by default shoot in a “flat” colour profile, dialing down the contrast, saturation and sharpness. This then allows you more latitude in the edit/post production to add detail, colour, contrast etc later.

DSLRs come with pre-loaded ‘picture styles’.

Although these often look quite ‘punchy’ (high contrast and deep colours) this can be problematic in post production as they can leave you with less room to push the image in different directions.

‘FLAT’ Picture Style
(Use this one!)



RESOURCES

<http://nofilmschool.com/> Site covering a number of production topics, from lighting to editing

<https://vimeo.com/videoschool> Numerous useful videos on various topics

<https://www.creativecow.net/> Huge online resource. Forums covering all camera/software topics

<http://www.lynda.com/> Online software training site

<http://www.cinematography.net/> Forum for professional cinematographers

<http://philipbloom.net/> Some articles on film making but a trusted resource for DSLR reviews

