MOVING IMAGE - DSLR CAMERA BASICS

THE DSLR CAMERA - A BRIEF HISTORY

ORIGINS

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.

INFLUENCE ON FILM MAKING

Suddenly, for around £3,000, you could shoot an image that previously had to be shot on a camera that cost at least £30,000 or shot on 35mm film (£400 per minute).
Independent and low budget film makers started to use DSLRs.
Having access to interchangeable lenses, a shallow depth of field and the ability to shoot crisp images in relatively low light allowed film makers to create more ‘filmic’ images than they could on previous HD video cameras.

VIMEO & ONLINE DSLR COMMUNTIES

At the same time as film makers began using DSLRs to shoot films,Vimeo (founded 2004) was the first web site to allow users to upload HD quality footage. Coupled with the filmic DSLR look and easy access to editing software new film making communities began to screen work on line.
Now film makers had more influence over the means of production and distribution of cinematic films on relatively small budgets and resources.

DSLR BASICS

Canon and Nikon DSLRs record video as a quicktime movie (.mov) using h264 compression.
They can shoot a movie size of up to 1920x1080 pixels at selectable frame rates (24/25/50/60 fps).

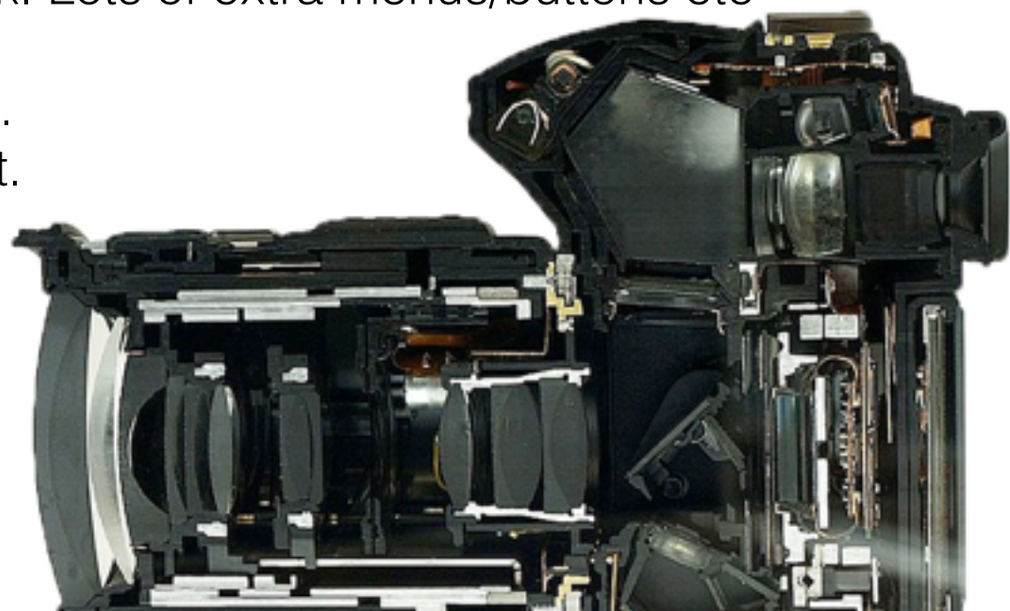
A 16Gb card holds approx. 40 minutes of full resolution footage.
A standard Nikon EN-EL14 battery lasts for approx. 90 minutes & takes approx. 90 minutes to charge.

DSLR PROS

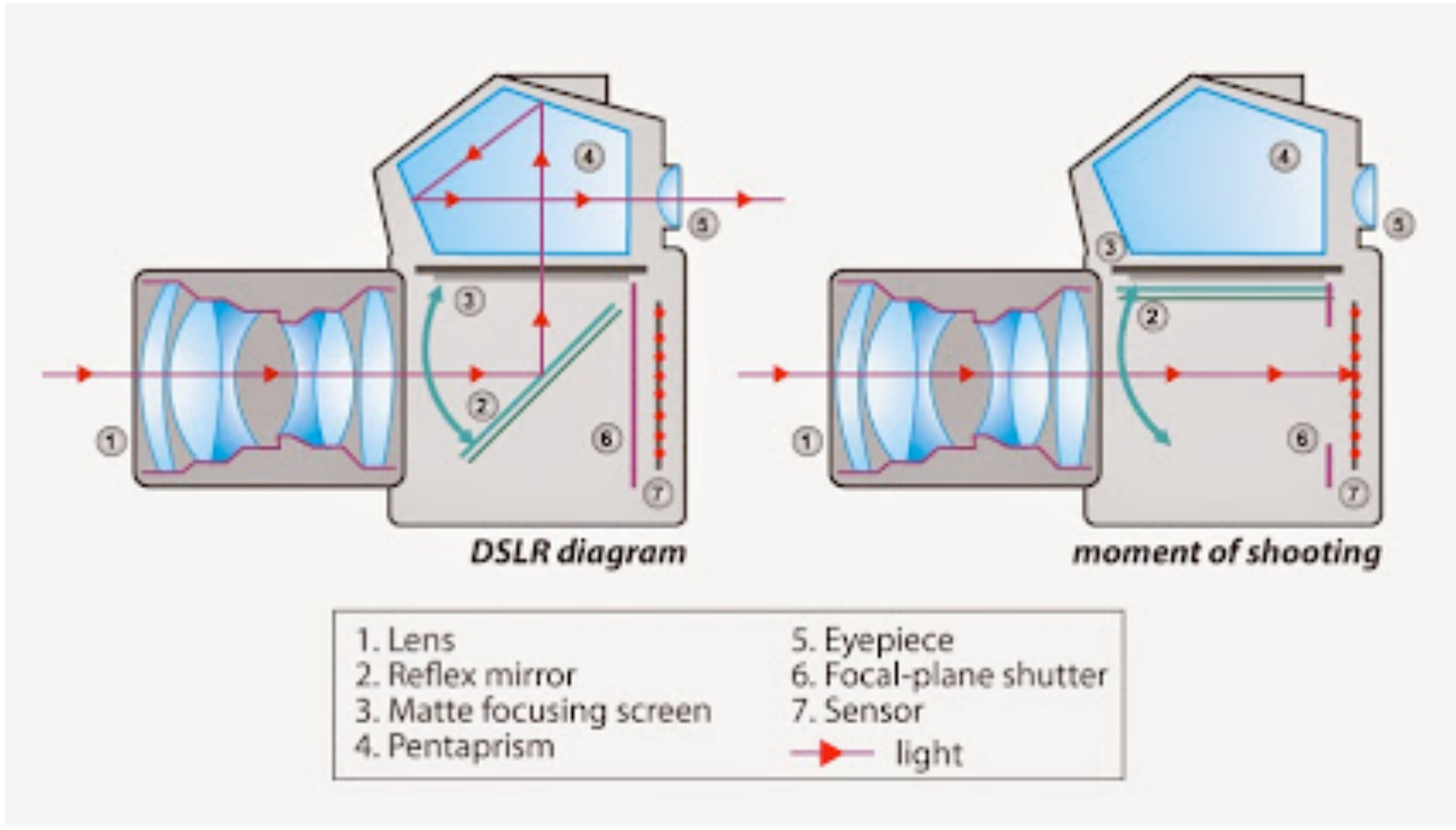
- DSLRs produce a ‘filmic’ look. Interchangeable lenses.
- Shallow depth of field.
- Light and portable.
- Good in low light conditions. Produces a ‘cleaner’ image than video cameras.

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.



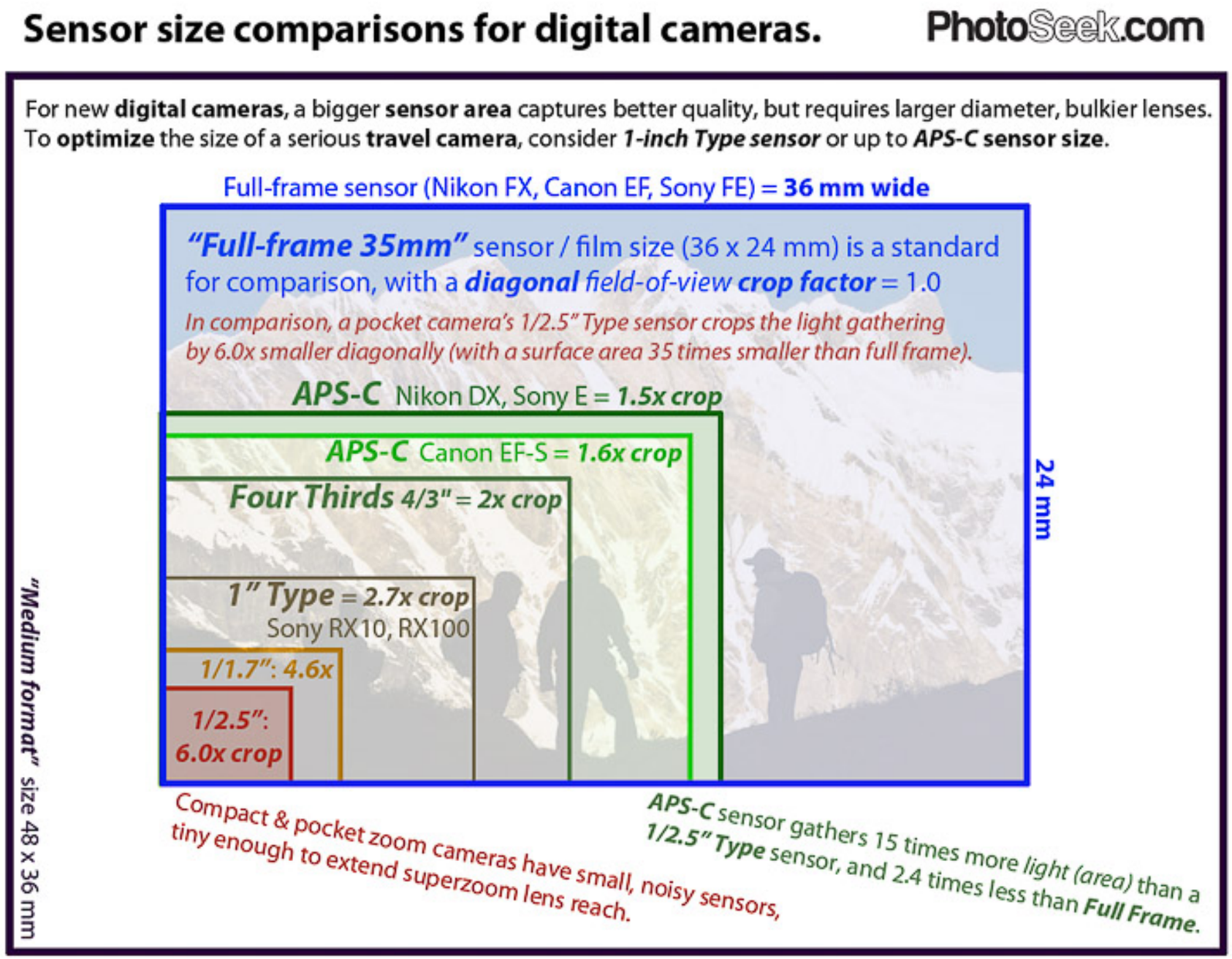
DSLR CAMERA DIAGRAM



When shooting video the mirror flips up and stays up to allow light to continuously pass onto the sensor. This is why on most cameras you can only use the digital screen (or ‘Live View’) at the back whilst filming.

DSLR SENSOR SIZES

A DSLR's 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.
Larger sensors require a larger camera body to house them.



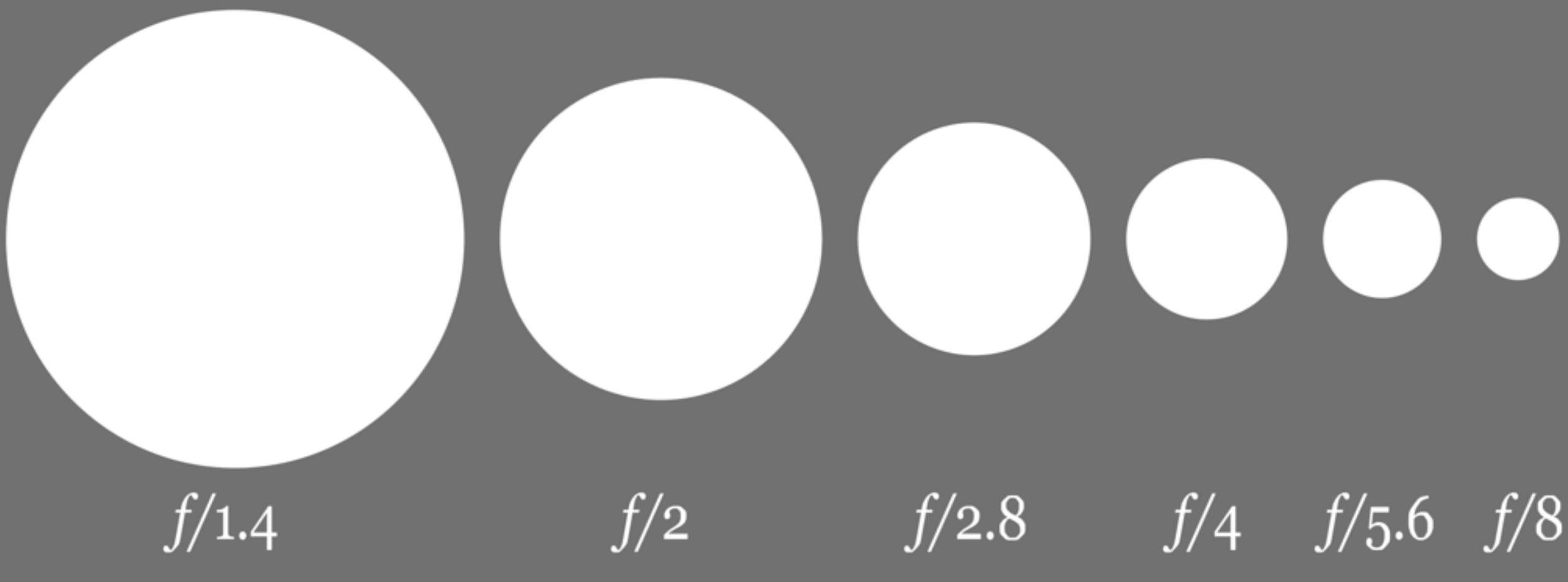
EXPOSURE

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.

Exposure is controlled either manually via the DSLR exposure control dial or automatically if the camera is on AUTO setting.
Some lenses (such as Samyang & Zeiss) are manual - meaning that you control the exposure by turning the exposure ring on the lens itself - the lens does not communicate electronically with the camera.

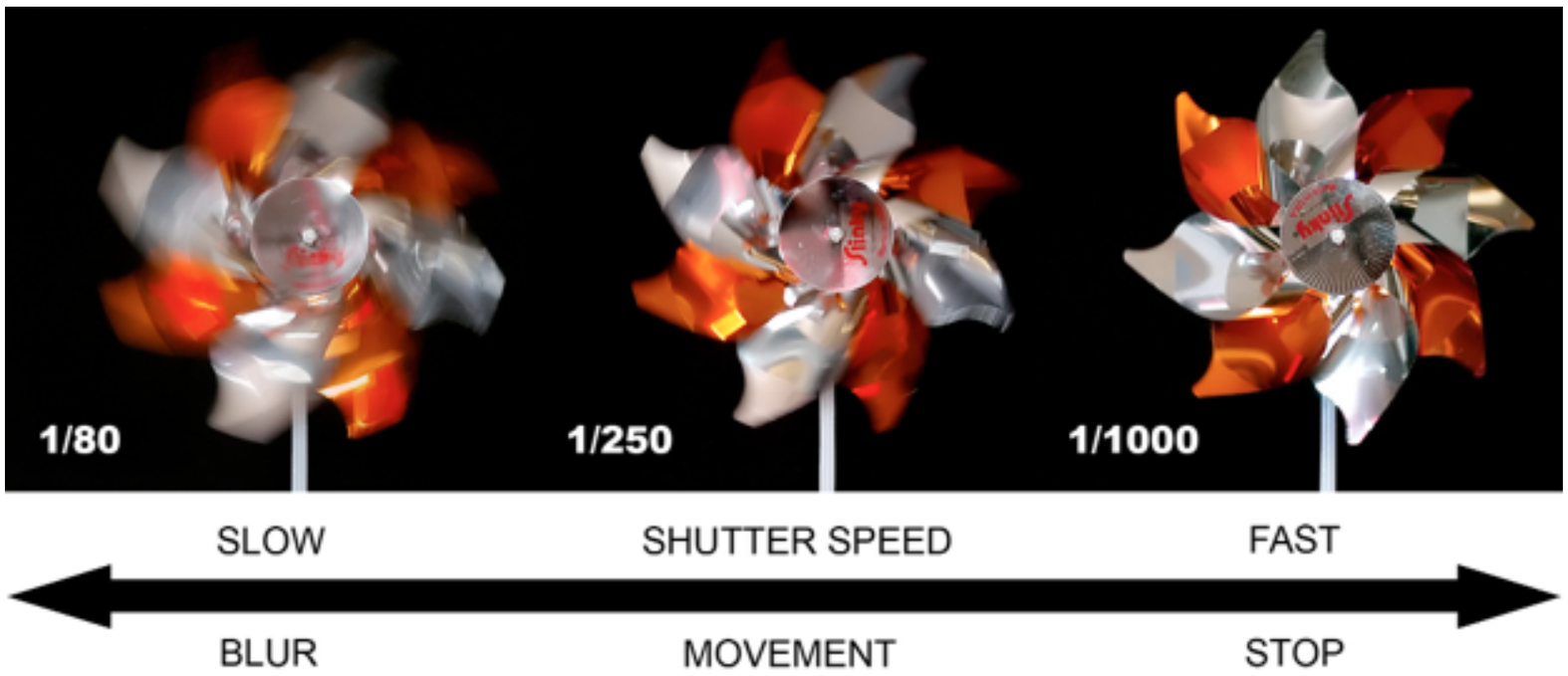
F- STOP relates to a lens aperture (or iris) opening or shutting, therefore letting more or less light into the camera. Confusingly, the lower f-stop number, the more light enters the lens.

'Faster' lenses can be opened to a lower f-stop and therefore work better in lower light.
i.e a Nikkor 12-24mm 1:4 G ED lens will open up to f1.4.



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.)

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

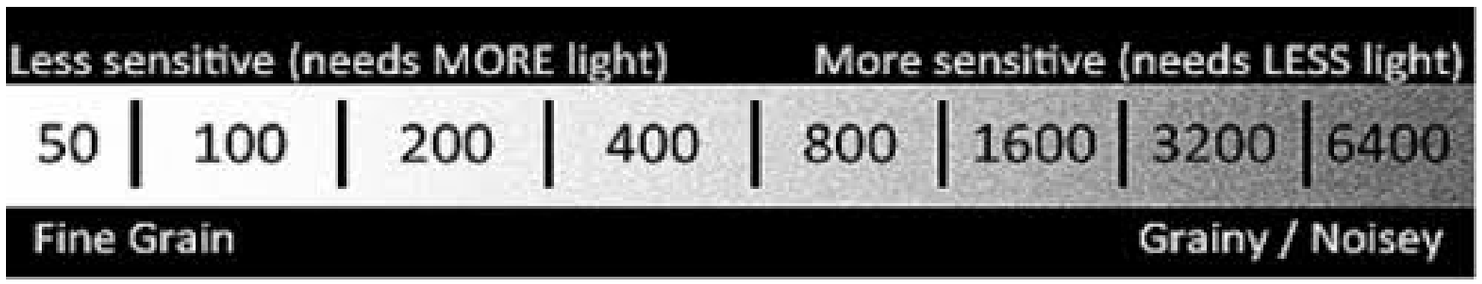
ISO

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

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.

All 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.

It's good practise to use the DSLRs manual focus at all times to avoid unintentionally focusing on the wrong subject or area within the frame.

To focus up a static shot zoom in as far as possible with the magnifying glass icon on the back of the DSLR, focus manually on the that point and zoom out again. This should ensure the entire shot is in focus.

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

WHITE BALANCE

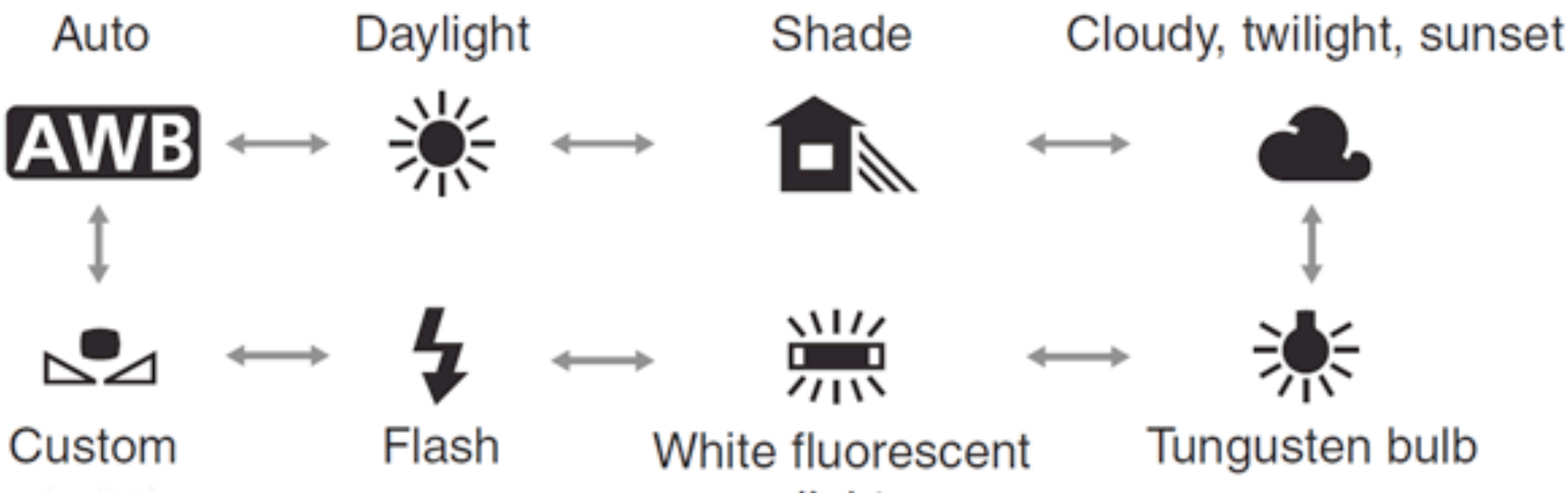
White balance refers to how the camera reads the colour temperature of the light.

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).

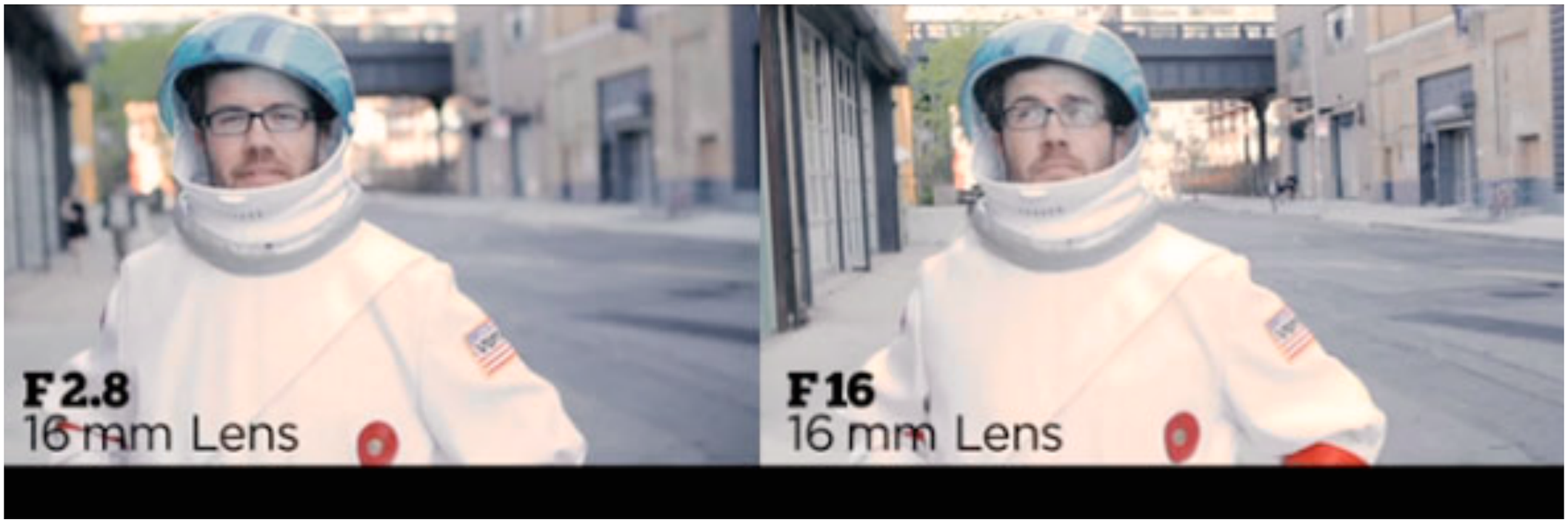
If the White Balance still seems wrong to the eye set:
MANUAL WHITE BALANCE

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



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 shallow DOF you'll need a fast lens (and lots of light!).

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

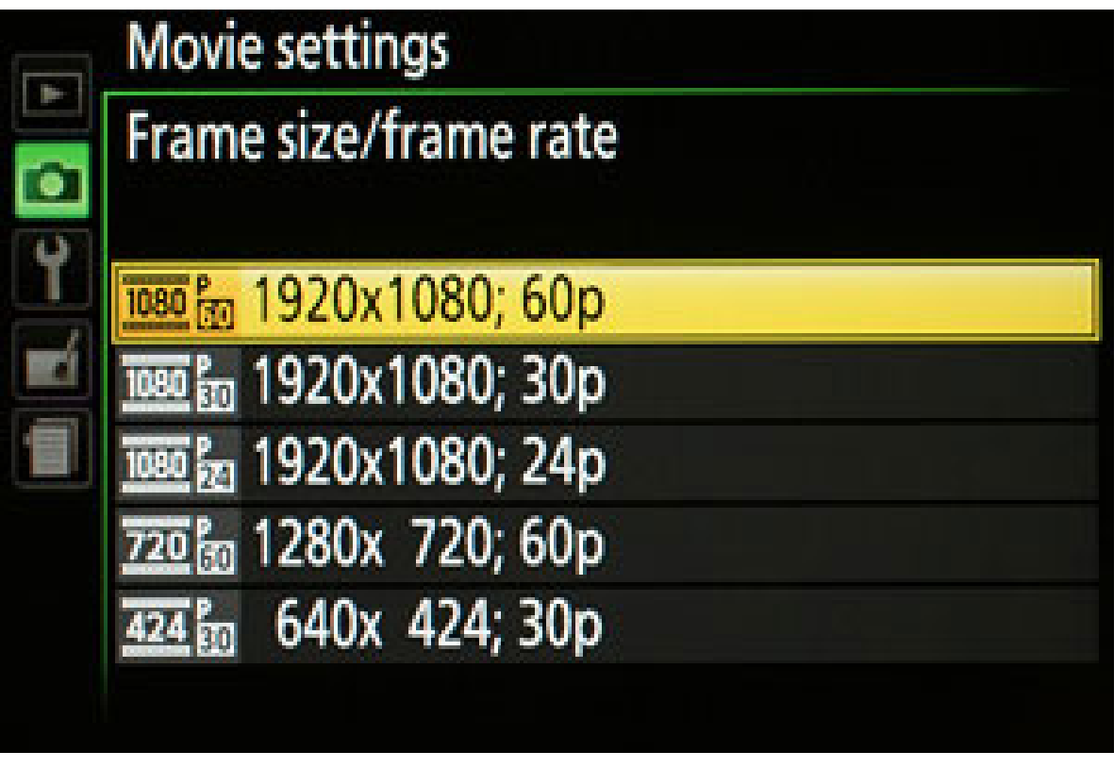
DSLR MOVIE MODE SETTINGS
(1920 X1080 & FRAME RATES)

DSLRs have different movie record settings to choose from:

1920 x 1080 24fps - This is the highest setting. Highest definition (1920x1080 pixels)
1280 x 720 60 fps - For slow motion filming. Records at more than twice the frame rate (will not play back on the camera in slow motion though, you need to do this in post production)

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 24fps on most projects.
Always check you have set the right movie record setting before filming!



SLOW MOTION

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!

PICTURE STYLES

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.

For example, if your footage is high contrast you are stuck with high contrast images in post.
Dialling down the contrast, saturation and sharpness may produce initial ‘flatter’ images but these allow you more latitude in the edit to add detail, colour, contrast etc later.

NOTE: Some cameras designed to shoot moving image such as the Blackmagic Ursa, Pocket Camera, RED & Arri Alexa shoot a ‘flat’ style by default.

‘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