

Photography course

(Back to basics)

Session 1 – Image capture

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Autumn 2021

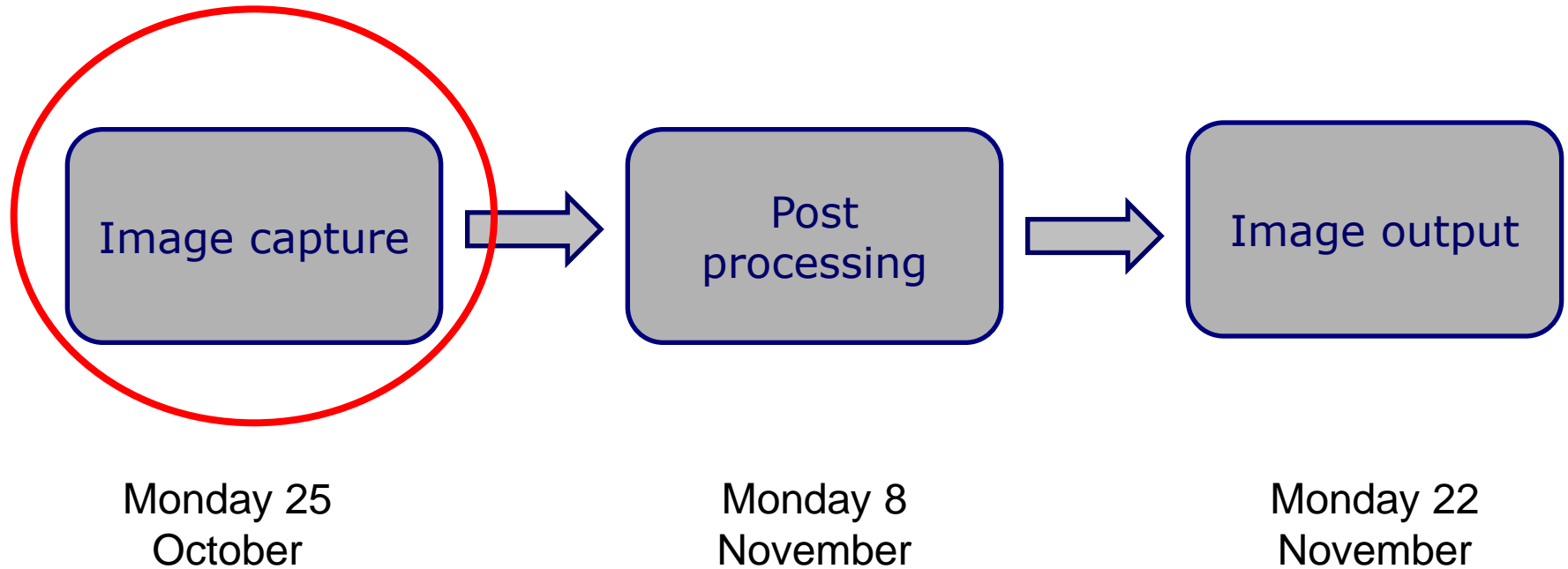
Aimed mainly at those members with less experience but may also act as a refresher for others



FORMAT OF WORKSHOPS

- Aim to go through the basics of each topic using slides which also act as notes
- Very informal so plenty of time to ask questions or raise issues
- At the end a few suggested tasks to try at home to test the theory
- The tasks can be reviewed if you wish at the beginning of the next session


PHOTOGRAPHY COURSE (BACK TO BASICS)





TOPICS COVERED TONIGHT

- Cameras and camera set up
- File size and type
- Sensors and lenses
- Focussing and depth of field
- Exposure
- Camera craft



Cameras and camera set up

- *There are a wide variety of cameras now available*
- *The available functions and how they work varies with model and make*
- *The location and names of the controls also vary*
- *Check how the topics discussed tonight work on your camera*

MODERN DIGITAL CAMERAS

- Camera technology has progressed hugely over the last few years
- SLRs being phased out in favour of mirrorless but still very good second hand SLR bargains
- Most modern cameras can produce high quality images - type and sensor size depends on your photography and budget
 - High M pixel (30Mp plus). Gives very high quality but at a cost and also need more storage and processing power. Good if crop a lot
 - Lower M pixel (15-30Mp). Quicker file transfer and less need for powerful processor. Fine if don't crop heavily

SMARTPHONES

- Claims for better and better image quality?
- True but....
 - Full frame captures 22x more light than smartphone
 - Smartphone sensor quality has improved a lot largely through very clever electronics
 - Whole process is automated – both the photograph and the photographer
 - Lens quality and versatility still not really comparable
- Smartphone
 - Great for the selphie generation and non photographers or when nothing else available
 - Although some “proper” photographers have used very successfully
- Digital cameras
 - Much more creative control if you know what you are doing
 - Much better ergonomics
 - Potential for much better images

IMAGE QUALITY AND NOISE

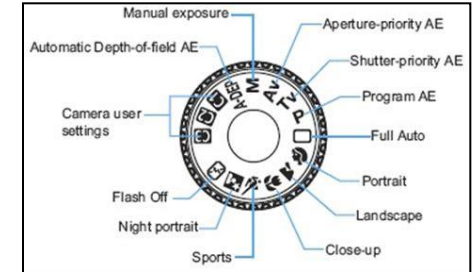
- Digital camera noise is equivalent to grain in film
- Increased ISO setting in digital cameras effectively amplifies the signal from the light sensor thus potentially more noise
- Much better in more recent cameras with clever electronics to minimise noise not conceivable a few years ago
- However as ISO increases, can still be an issue with older cameras, or smaller sensors, particularly in darker areas of picture
- Noise can be further reduced post capture
- As with film grain, noise can be used creatively to add mood to images





CAMERA MODE

Most cameras have various modes. Understand what each does and use right mode for different types of image




- Auto
 - Does everything for you! Mainly for happy snappers
- Program mode
 - Balances speed and aperture according to light
- AV mode
 - Allows you to fix aperture with speed being set by camera exposure-good for DOF control but watch camera shake*
- TV mode
 - Allows you to fix speed with aperture being set by camera exposure-good for movement or long focal length lens
- Manual mode – work it out yourself
- Bulb – timed exposures
- Custom function- some cameras allow you to set up different custom functions for particular regular use

**Auto ISO can help here*

KNOW YOUR CAMERA

- Understand your camera settings and its limitations (e.g. how high can you push the ISO?)
- Learn to change key settings (e.g. exposure, exp. compensation, ISO, aperture, speed, focus points) automatically without looking
- Learn where the more specialised settings are in the menu (autotracking, flash settings etc. etc.)
- Set file type (see later)

Manuals can be boring but well worth looking through in bite sized chunks. Alternatively see on line tutorials for your camera or buy self help guides



File size and type

FILE SIZE/TYPE



■ Memory Cards

- Use the best makes - not much more expensive than others and more reliable
- Only use fast write cards if you really need them (HD video or large files and fast shooting rate)
- What capacity to use? Risk v Convenience

■ File size

- For the best image set file size to maximum possible
- Storage is relatively cheap- information cannot be recaptured once taken

■ File type

- Ideally use raw and convert later
- Alternatively can often shoot raw with simultaneous jpeg (but uses more card space)

ALL DIGITAL PICTURES START LIFE AS RAW

- A raw file contains
 - The basic information about the image captured by each pixel
 - EXIF data- camera settings
- Raw files need to be converted to other formats (jpeg, TIFF, PSD, DNG) for most subsequent output and image manipulation
- In most compact cameras (and smartphones?) there is no option to output raw files
 - conversion to jpeg takes place within the camera
 - depending on type there is some ability to adjust raw image conversion
- In higher quality cameras the image can be output as raw files allowing much more control over conversion in separate software

WHY RAW- A DIGITAL NEGATIVE

■ Benefits

- Better quality with no image degradation
- Greater flexibility to adjust image settings post capture
- Better control over image e.g. shadow and highlight detail
- Some changes e.g. colour temp, can only be done effectively on raw files

■ Disbenefits

- File size
- Extra processing step before use

Most professional photographers use raw unless fast processing and transmission needed for press or similar

RAW FILE FLEXIBILITY

One Raw Image Can Be Processed in an Infinite Number of Ways:

Think of your raw capture as your digital negative. It never changes, but it can be processed any number of different ways.



Tuned for Web



Tuned for Print



Converted to B&W



WHAT CAN RAW CONVERSION DO?

- Can change virtually any aspect related to the pixels and related histogram
- Includes
 - Colour temperature/tint/colour balance
 - Saturation
 - Contrast/Clarity
 - Brightness, levels, exposure, curves
 - Cropping and rotation
 - Sharpness and noise reduction
 - Format and size of converted image
- Importantly any adjustment does not impact the original pixels
- Many also now offer layer masks, cloning, filters etc.

But may still need PS for special effects and complex layers

IN-CAMERA JPEG ADJUSTMENT

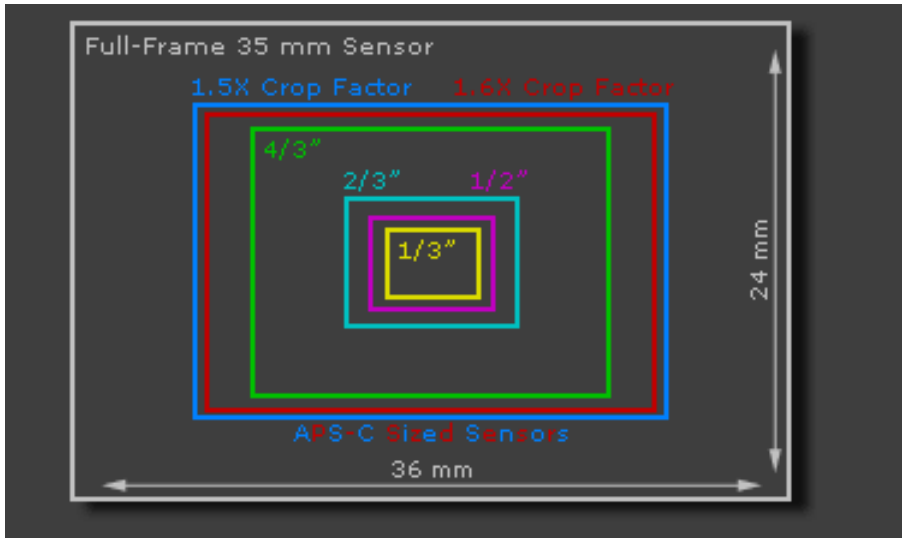
For those that want to shoot jpegs:

- Many cameras allow you to define the way that the raw image is processed
 - E.g. Colour/saturation/sharpness etc.
- Sometimes called “styles” or equivalent
- Effectively you provide instructions to camera for internal processing of all jpegs
- Better cameras allow you to set different styles
 - i.e. raw processing instructions for different types of image

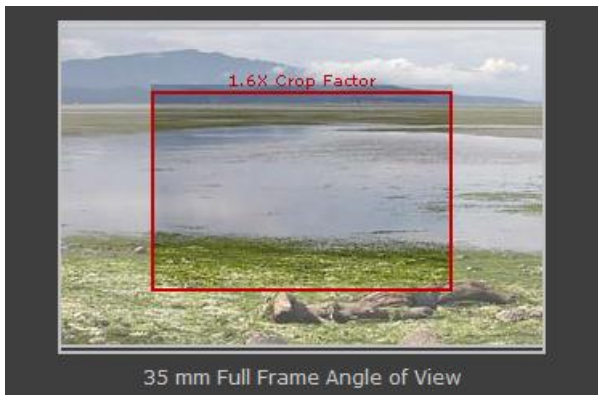


Sensors and lenses

UNDERSTAND THE IMPACT OF SENSOR SIZE



- Cropped sensors tend to be lower quality than full frame
- But compensated by improved electronics and the fact that they use the (best) centre of lens
- Small crop sensors effectively “multiply” the effective focal length of lenses
- Full frame more expensive but better quality **if** use good lenses



MANY OF THE BEST PHOTOGRAPHERS USED ONLY ONE LENS

Henri Cartier- Bresson used a Leica with 50mm lens

“Above all, I craved to seize the whole essence, in the confines of one single photograph, of some situation that was in the process of unrolling itself before my eyes”



“During the work, you have to be sure that you haven't left any holes, that you've captured everything, because afterwards it will be too late”

The “decisive moment” – a fleeting meaningful instant captured by the camera

Still very true...but with the advent of modern cameras a variety of lenses can be used to develop creative images

DIFFERENT USE OF LENSES

- Telephoto ($>150\text{mm}^*$)
 - Good for wildlife and sports
 - Compresses perspective so can use to isolate images within landscape
 - May need tripod unless high speed/image stabiliser
 - Relatively shallow depth of field
- Mid range ($35\text{-}150\text{mm}^*$)
 - Good for general work and portraits
 - Ideal portrait lens $80\text{-}90\text{mm}$
- Wide angle ($<35\text{mm}^*$)
 - Landscapes (but need foreground interest)
 - Can also use for environmental portraits

* Full frame equivalent - remember to convert for other sensors

MACRO LENSES

- Macro (close up) work a topic in its own right
- Macro lenses allow much closer focussing than normal lenses
- Designated by multiplication factor
 - 1x means actual object is same size on sensor
- But closer you go the shorter the depth of field
- Can achieve macro with other approaches such as close up filter or extension tubes

PRIME v ZOOM LENSES


- Prime (Fixed focal length)
 - Smaller, faster (wider aperture)
 - Sharper relative to cost
 - Need more lenses to cover different focal lengths
 - Need to move position to obtain best composition
- Zoom
 - Usually larger in size but reduces need for lots of separate lenses
 - Usually slower (but image stabiliser helps)
 - Lower depth of field
 - Image quality tends to be poorer relative to cost

E.G Canon 50mm F1.8 (£119) 24-70mm F2.8 (£1779)

FILTERS

- Normally best to have simple UV filter to protect lens
- But other specialist filters may be useful for digital cameras:
 - Polarizer- improves saturation and reduces reflections
 - Graduated filters to balance light skies with darker foreground
 - ND filter to reduce speed- “milky” water/cloud effects
 - Close up filter (“cheap” macro)





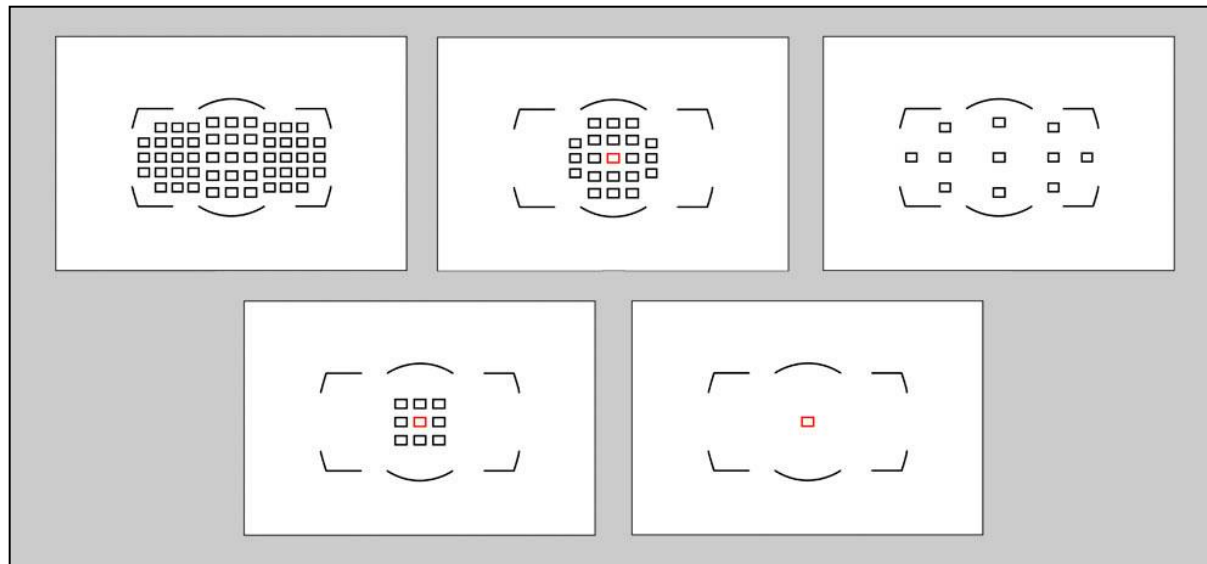
Focussing and depth of field

AUTOFOCUS

- Standard autofocus is usually very accurate on most modern cameras
- More sophisticated cameras provide other focus options dependant on the make and model
 - Zonal focus to allow specific focus on part of image
 - Spot focus for very accurate focusing on single object
 - Tracking focus for moving objects
- For accurate work may need manual focus
 - Macro where depth of field very small
 - Accurate landscape images using hyperfocussing

SETTING FOCUS POINTS

- Modern cameras allow flexible focus points/zones
- Learn how yours work
- Understand where is the best compositional point of focus for the shot
- Set focus points according to subject
- Or lock central focus and recompose



LENS AND DEPTH OF FIELD (DOF)

- Depth of field
 - The distance within the image which is in focus
- Varies with:
 - Lens
 - Aperture
 - Image distance
- Small DOF obtained when:
 - Close to subject
 - Large aperture (e.g. F2.8)
 - Long focal length (e.g. >300mm)
- Large DOF obtained when:
 - Far away from subject
 - Small aperture (e.g. F16)
 - Short focal length (e.g. 24mm)
- Can use DOF creatively



In low light large DOF may require long exposure and thus camera shake. Use tripod or increase ISO

ASSESSING DEPTH OF FIELD

- Older lens often had DOF scale but not usually available on modern zoom lens
- With experience just guess
 - F16 for large DOF
 - F8 for general
 - F4 for background blur
- Alternatively:
 - DOF calculator
 - DOF preview (Often dark with SLR, better with mirrorless)
 - Use hyperfocal point



HYPERFOCAL POINT

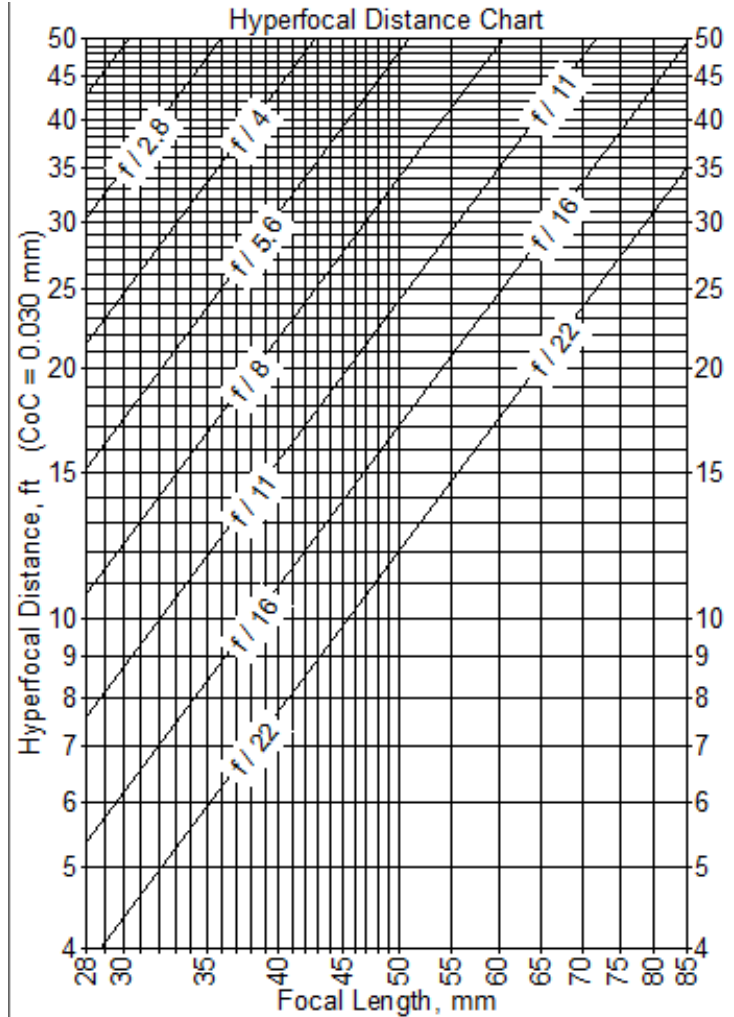
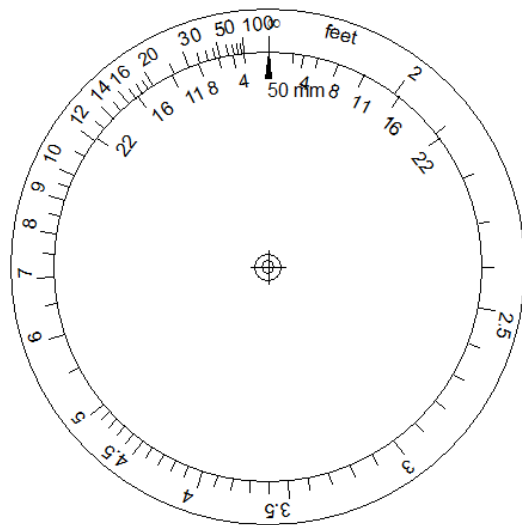


Hyperfocal point

- Hyperfocal point is “the focal point within the picture where everything from half that distance to infinity is in focus”
- Approx 2x more DOF behind hyperfocal point than in front
- Focussing at infinity “wastes” DOF
- Thus focussing at the hyperfocal point maximises DOF

MORE DOF INFORMATION

- Useful free information
- <http://www.dofmaster.com>



CREATIVE USE OF DOF

- Learn how use of DOF can help your image
- Shallow DOF to focus on main subject- can be off centre to improve composition
- Make sure that focus point is on main part of image e.g. eyes for portrait
- Large DOF for landscapes etc. but make sure there is foreground interest

CREATIVE USE OF DOF

differential focussing



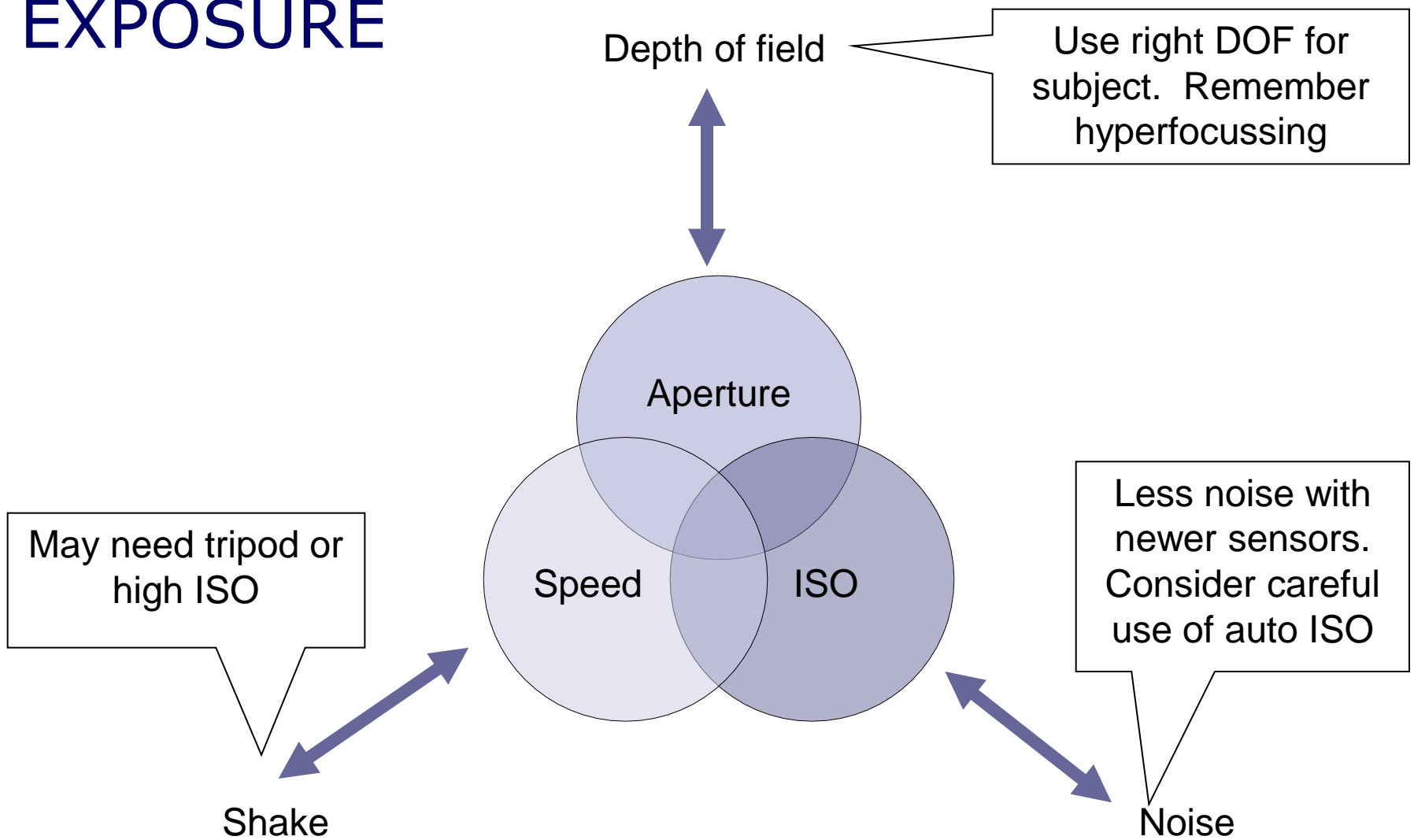


Exposure

EXPOSURE

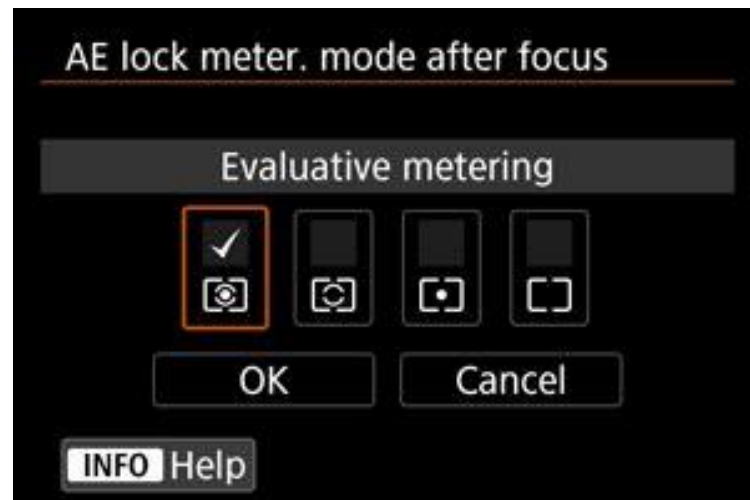
- Need to balance three different settings to control exposure
 - ISO
 - Aperture
 - Speed
- “Auto” does this for you but you lose control
- Use Aperture, Speed or ISO settings to improve control depending on image subject and available light
- Can autobracket exposure manually and some cameras have “autobracketing” (but uses up card space faster)

EXPOSURE



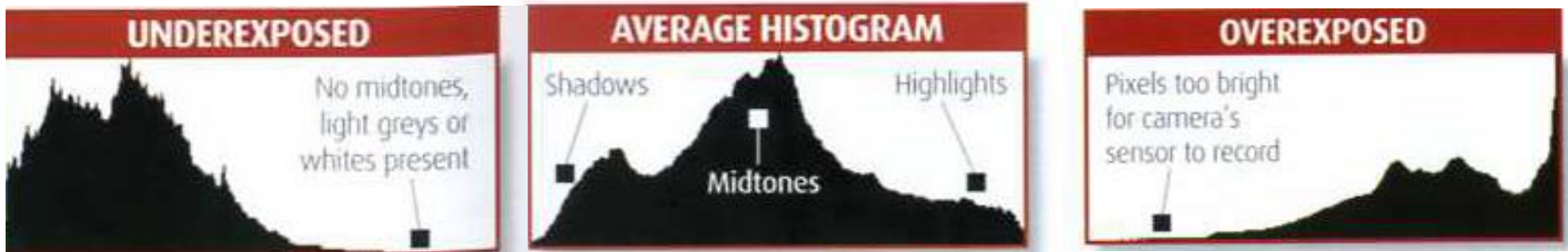
EXPOSURE METERING

- Exposure metering is usually very accurate on modern cameras
- Better cameras often give exposure options
 - Average
 - Evaluative- best default option
 - Spot - good if main subject very different exposure compared to rest of image
- If in doubt consider using bracketing or spot metering on image main subject



CHECKING THE HISTOGRAM

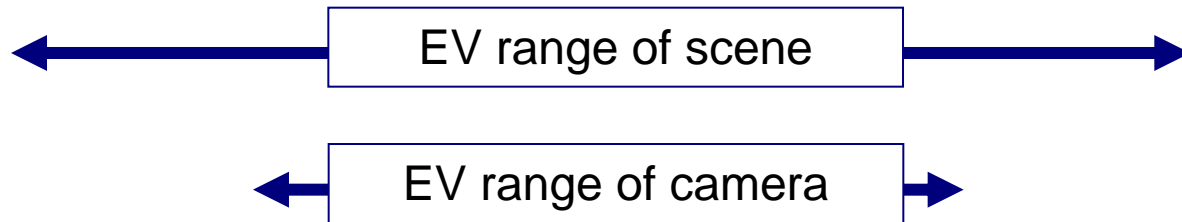
- The histogram is your friend
- Shows distribution of light and dark pixels
- Learn to read in the field
- Check histogram to avoid loss of detail at both ends



DEALING WITH TRICKY EXPOSURES

- Not all scenes are average in terms of exposure
- Exposure meters do a good job but can be fooled
- For example:
 - Snow scenes, white wedding dresses are usually underexposed
 - Sunsets, dark moody interiors are usually overexposed
 - Bright contrasty scenes
- In such situations check the image and if necessary use exposure compensation control

MANAGING HIGH CONTRAST PICTURE

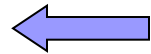
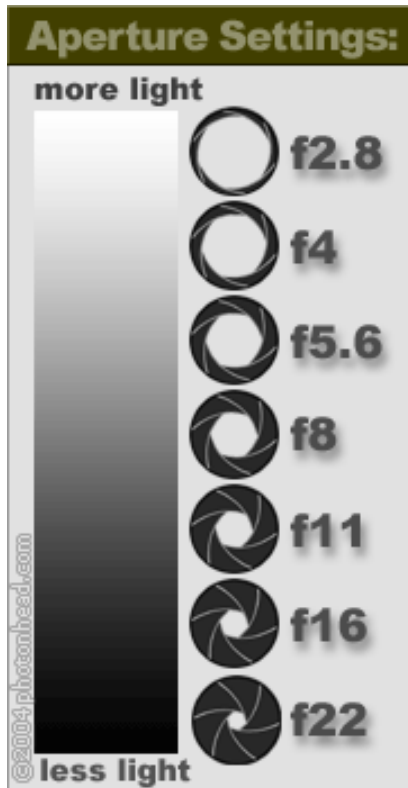


- All cameras including digital have finite exposure range (EV)
- In high contrast situations can either blow highlights or lose shadow detail
- Options
 - Compose picture to minimise EV range (e.g. avoid bright sky)
 - Bracket exposure and correct later (e.g. HDR)
 - Use fill in flash
 - Use graduated filters

POST CAPTURE EXPOSURE CORRECTION

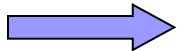
- If take in raw there is considerable flexibility to manage exposure post capture
- Can easily correct in by at least ± 1 (and maybe more) stops
- But even good raw converters cannot recover a poorly exposed image
- Think about the exposure that is right for the image and get as right as possible in camera

APERTURE

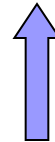


Less DOF

More DOF



f/1.0 f/1.4 f/2.0 f/2.8 f/4 f/5.6 f/8 f/11 f/16 f/22 f/32 f/45 f/64



Lower limit for most
zoom lenses

- Aperture controls light entering camera
- But also controls depth of field

SPEED-MINIMISING CAMERA SHAKE

- Need high speed to freeze movement- birds/sports/people
- Panning with lower speed sometimes give better creative effect
- But as speed decreases, especially close up, greater risk of camera shake
 - Rule of thumb: Speed > focal length
 - E.g. 200mm full frame: Speed > 1/200 sec
- Ways to minimise problem
 - Use tripod or other stable surface
 - Use image stabilised lens and/or camera
 - Increase the ISO
 - Have good camera grip technique
- With SLRs at lowish speeds mirror movement causes vibration
 - Avoid speeds around 1/15 to 1/4, and use mirror lock up and remote release



Cameracraft

What is your subject

- Compose the shot
- Use thirds?
 - Lead in lines?
 - Subject separation?

Think differently

Which settings to use



Right speed
Right DOF

Think background

Check for distractions

Using your camera creatively

- Take plenty of shots. Remember the “decisive moment”
- Be ready to react and change settings quickly if necessary



THINGS TO TRY AFTER THE WORKSHOP

1. Review material from this session and cross check with your camera
2. Check your file type set up and other settings
3. Experiment with the exposure control options on your camera (and look at histogram)
4. Check noise settings on your camera- know how far you can push your sensor
5. Experiment with creative use of DOF



Hope you found this useful?

But let me know of any improvements?



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