

# Obtaining the best image

Bob Breach

# Topics covered

- File size and type
- Sensors and lenses
- Focussing and depth of field
- Exposure
- Camera set up options

Illustrated through

- Practical use of camera during session
- Image analysis (brought by leader from journals etc)
- Image analysis on set theme (brought by participants)

# ROUGH TIMINGS

- 7.30 File size and type
- 7.50 Sensors and lenses
  - Group exercise 1
- 8.20 Focussing and depth of field
  - Group exercise 2
- 9.00 Exposure
  - Group exercise 3
- 9.30 Camera set up options
- 9.45 Finish

File size and type

# FILE SIZE/TYPE

## ■ File size

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

## ■ Cards

- Use the best you can afford- not much more expensive than others and more reliable
- Only use fast write cards if you really need them (large files and fast shooting rate)



## ■ 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 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 SLR and other 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
- Better control over image e.g. shadow and highlight detail
- Easier image enhancements
- Flexibility to adjust image settings post capture

## ■ Disbenefits

- Write time to card
- File size
- Extra processing step

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

# 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

# TIFF v JPEG

## ■ TIFF

- Better quality with no image degradation
- Larger files
- Choice of 8bit or 16 bit
  - 16 bit much better (65000 grey tones compared to 256)
  - Not all Photoshop filters work with full 16bit TIFF
- Ideal for
  - larger quality prints
  - competitions or commercial purposes
  - Where lots of adjustment planned

## ■ JPEG

- Smaller file size which can be varied
- Quality degrades the more manipulation takes place
- Ideal for
  - Smaller prints
  - Web
  - Slide shows

# WHAT CAN RAW CONVERSION DO?

- Basically can change virtually any aspect related to the pixels and related histogram
- But not moving the pixels around or selectively adjusting pixels in part of the image (but newer programmes getting better at this)
- Includes
  - Colour temperature/tint/colour balance
  - Saturation
  - Contrast
  - 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

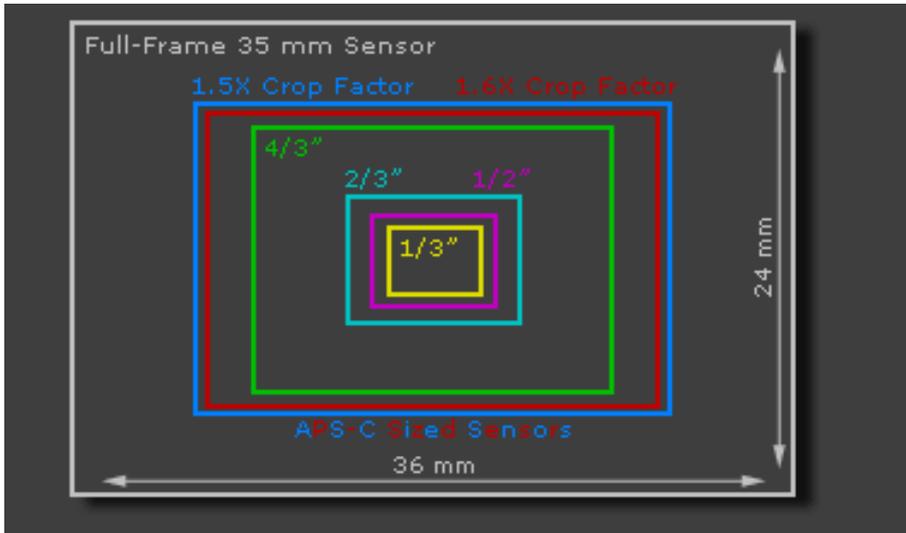
# WHAT RAW CONVERSION CANNOT DO?

- Layers and layer masks
- Cloning
- Special filter effects

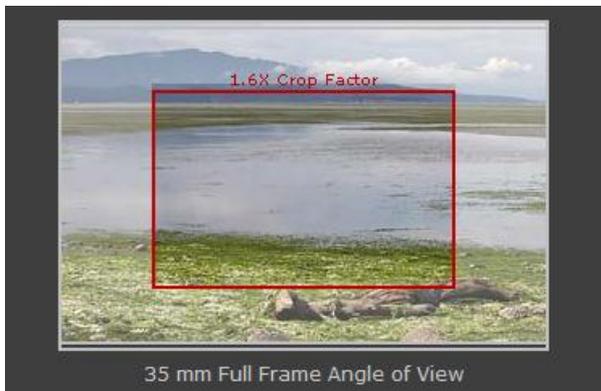
But watch this space

# Sensors and lenses

# UNDERSTAND THE IMPACT OF SENSOR SIZE



- Cropped sensors tend to be lower quality than full frame (more pixels packed onto sensor)
- But compensated for by fact that they use centre of lens which is best part
- Small 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”

But with the advent of modern cameras a variety of lenses can be used to develop creative images

# DIFFERENT USE OF LENSES

Remember to convert for sensor size

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

# 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)
  - Image quality tends to be poorer relative to cost

# FILTERS

- Normally have simple UV filter to protect lens
- Less need for colour filters with digital
- Polarizer- improves saturation and reduces reflections
- Graduated filters to balance light skies with foreground
- ND filter to reduce speed- “milky” effects

# GROUP EXERCISE 1

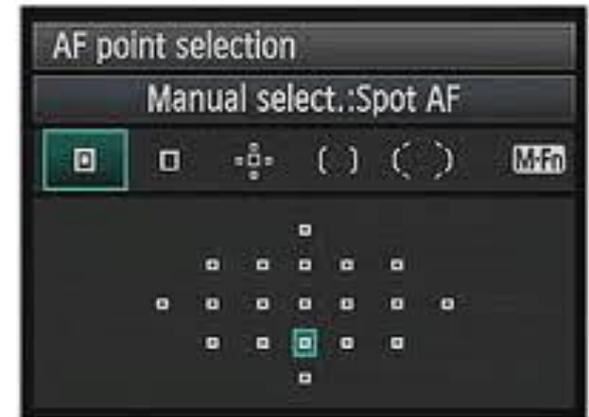
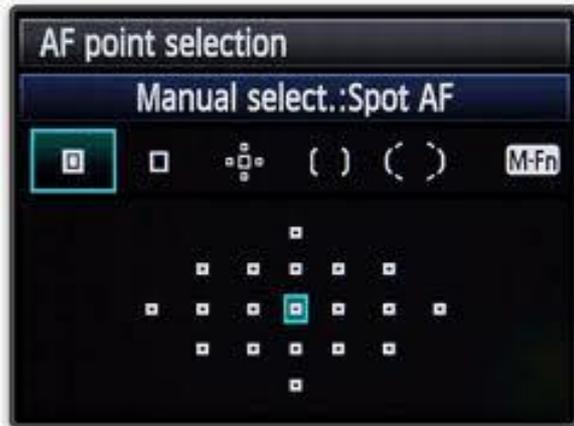
Investigate impact of different focal length lenses and sensor type

# 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
- Understand how yours work
- 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 can require long exposures (shake)

# ASSESSING DEPTH OF FIELD

- Older lens often had DOF scale but not usually available on modern zoom lens



- Alternatively:
  - DOF calculator
  - DOF preview (but often dark)
  - Use hyperfocal point

# HYPERFOCAL POINT

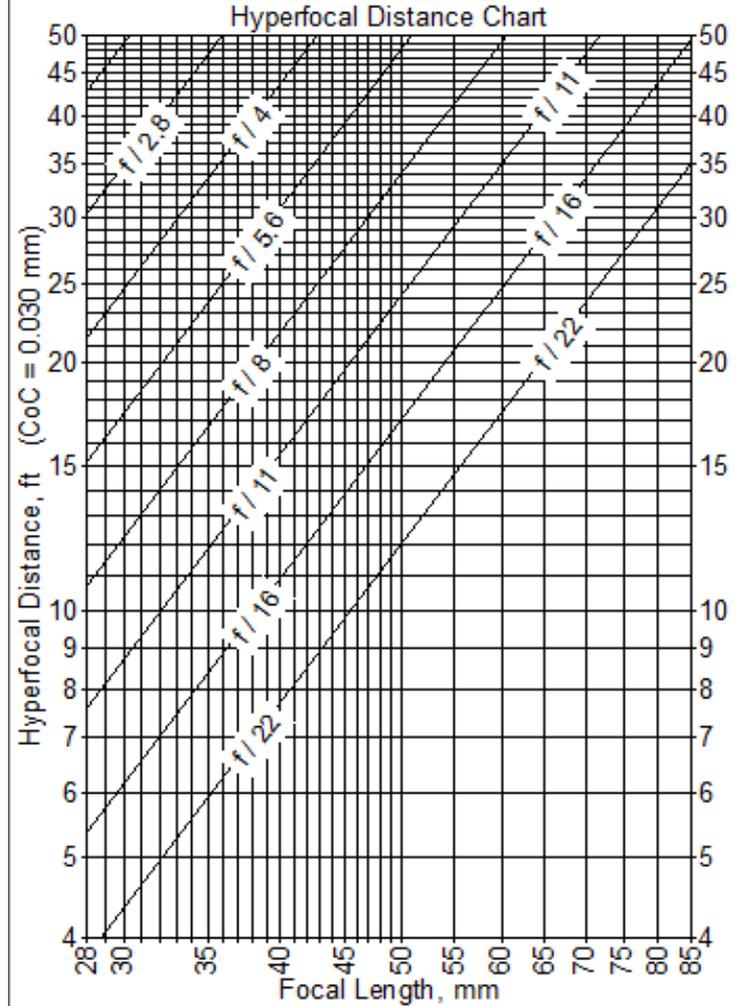
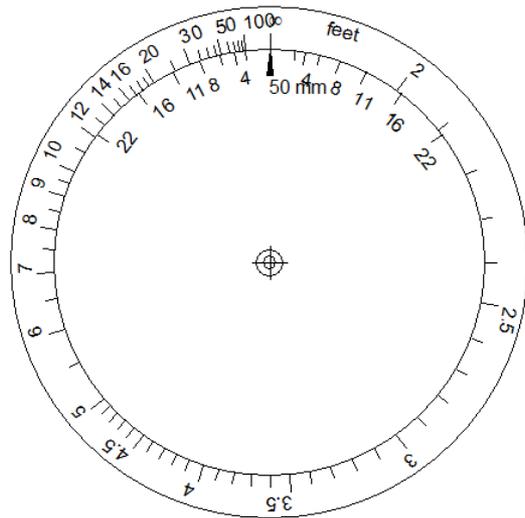


Hyperfocal point

- 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



# GROUP EXERCISE 2

1. Review images brought in by course participants
2. Experiment with creative use of DOF

Exposure

# EXPOSURE

- Need to balance three different settings to control exposure
  - ISO setting
  - 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)

# CORRECT EXPOSURE

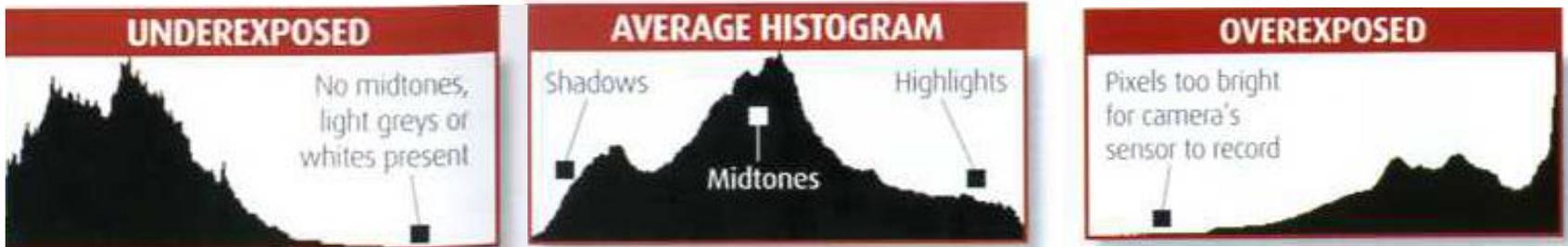
- If take in raw there is considerable flexibility to manage exposure post capture
- If take in raw can easily correct in post production by up to ± 1 (and maybe 2) stops
- But even good raw converters cannot recover a poorly exposed image
- Think about the exposure that is right for the image and get as right in camera as possible

# EXPOSURE METERING

- Exposure metering is usually very accurate on modern cameras
- Better cameras often give exposure options
  - Average
  - Evaluative
  - Spot
- But metering can be fooled in difficult conditions
  - E.g. Snow scenes are underexposed by auto
- 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
- If a problem consider exposure bracketing



# POST CAPTURE RAW LEVELS ADJUSTMENT

Using the Levels Tool

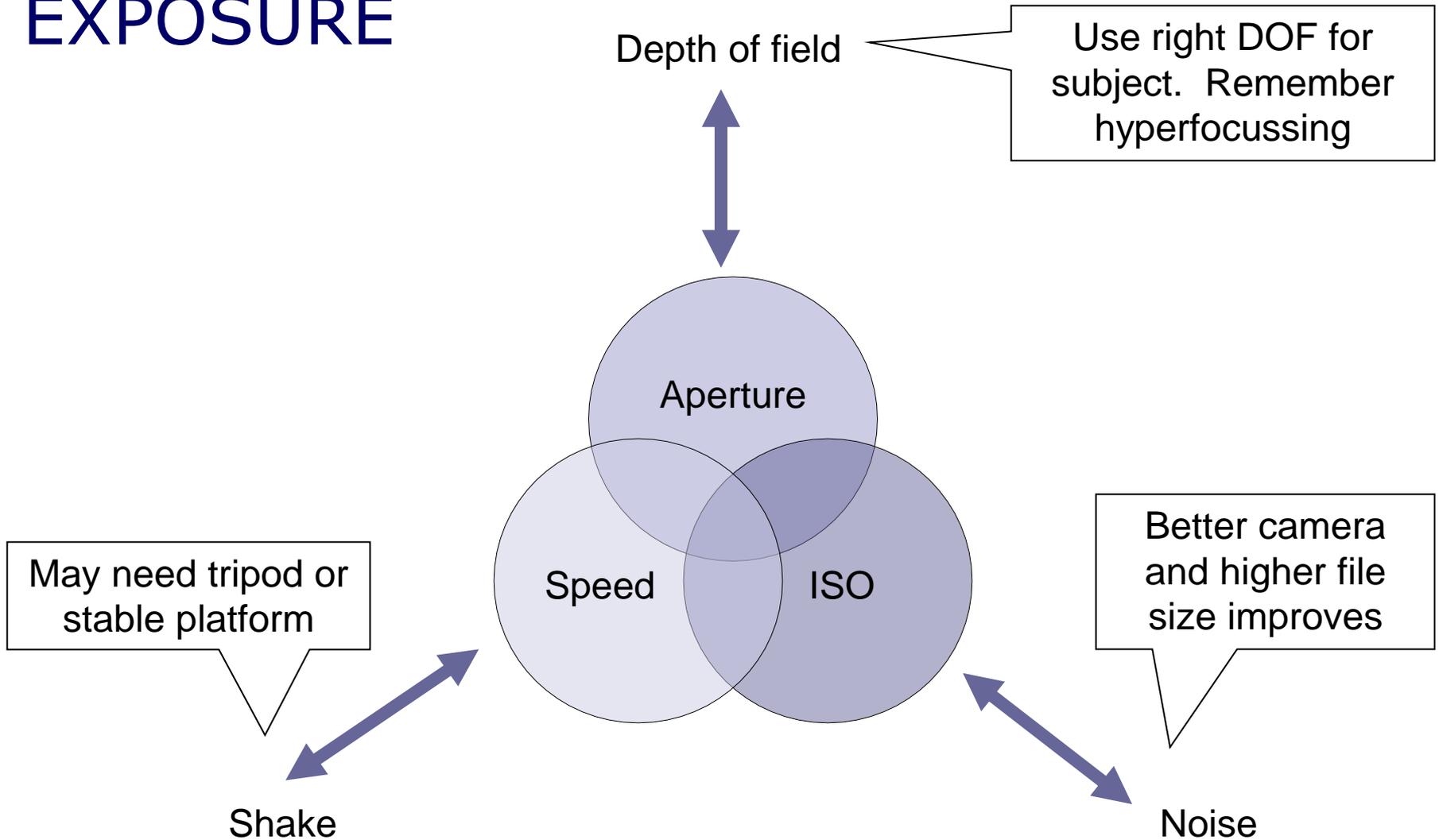


The left image is straight out of the camera and shows both lens flare and some degree of underexposure. The right image is after correction in the Levels Tool.

**Before**

**After**

# EXPOSURE



# MINIMISING CAMERA SHAKE

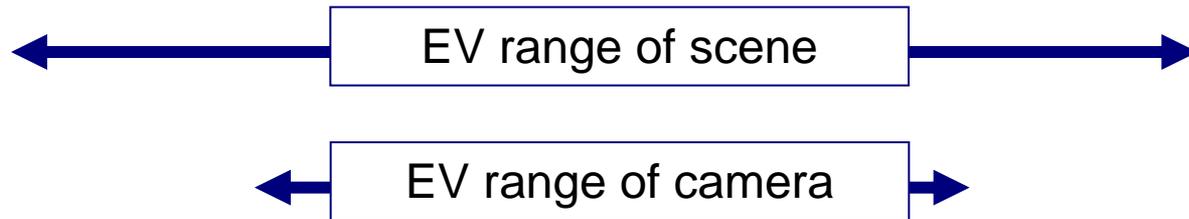
- Slower the speed more likely to have camera shake
  - Rule of thumb: Speed > focal length
  - E.g. 200mm: Speed > 1/200 sec
- Ways to minimise problem
  - Use tripod or other stable surface
  - Use image stabilised lens
  - Increase the ISO
- Care: at lowish speeds mirror movement causes vibration
  - Avoid speeds around 1/15 to 1/4
  - Use mirror lock up
  - Use remote release



# DEALING WITH NOISE

- Digital camera noise is equivalent to grain in film
- Increased ISO setting in digital cameras effectively amplifies the signal from the light sensor
- Depending on the camera as ISO increases can get more “noise” typically worst in darker areas of picture
- Full frame cameras tend to be less noisy and better and newer cameras use clever electronics to minimise noise
- Noise can be further reduced post capture
- As with film grain noise can be used creatively to add mood to images

# MANAGING HIGH CONTRAST PICTURE



- All cameras including digital have finite exposure range
- 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

# GROUP EXERCISE 3

1. Check the exposure control options on your camera
2. Experiment with different exposures

# Camera set up

# CAMERA SET UP OPTIONS

- Program mode
- AE mode
- TV mode

# HOMEWORK

1. Set up your camera for different images
2. Review material from this session
3. Take images for next session
  - One or two prints to show how colour can enhance the image
  - One print in mono where colour detracts