

Understanding Flash

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PLAN FOR TONIGHT

- A presentation covering
 - Flash – what and why
 - Different flash settings and why and how to use them
 - The benefits of and approach to off camera flash
 - Flash modifiers and gadgets for flash
- Plenty of time for questions or discussion
- Some suggestions of things to try at home using your own camera and equipment

Flash settings vary with camera and flash unit. Check manual and don't be afraid to experiment

Photography show returns to NEC in September which gives opportunity to see and try some stuff



- Why do many press photographers use flash even in daylight?



- Or wedding photographers?



- Or wildlife photographers?



For humming birds in flight



Or macro




- Or portrait photographers?



Flash →



On camera flash bounced off reflector



Because flash can provide an easily portable and controllable extra source of light when ambient light is poor



FLASH:

WHAT AND WHY

FLASH – WHAT AND WHY

Flash is an easily portable and controllable source of extra light

- Modern cameras and flash units can be quite sophisticated and often with very useful additional features
- Flash set ups can provide:
 - An extra or even main source of light in dark/poor natural light conditions
 - Fill in flash to soften or balance harsh natural lighting
 - A potentially cheaper alternative to studio lights
 - A creative tool

TYPES OF FLASH

Limited function

- Medium power
- May or may not rotate/pivot
- Less controls
- Useful to carry as lightweight backup



Full function

- Powerful
- Rotates and pivots
- Range of controls
- Can be wireless controllable
- Can act as master/slave



Built in

- Not very powerful
- Little control
- Harsh direct lighting
- Useful in emergency

MACRO FLASH LIGHTING

- For macro work, lighting is often a major challenge so can buy specialist (but expensive) macro lights



- But standard flash with a large diffuser can work almost as well

FLASH POWER OUTPUT

- Flash power is quoted as Guide number (GN) – the maximum flash distance that the light can reach under specific ISO (normally 100)

$$GN = \text{distance} \times F \text{ number}$$

- E.g. Flash with GN 60 will light up to
 - 15m away at F4
 - 7.5 m at F8
- Note however that the flash power decreases by the square of the distance
- But some flash units have the ability to “zoom” with a zoom lens by using a narrower beam thus minimising the effect

Note

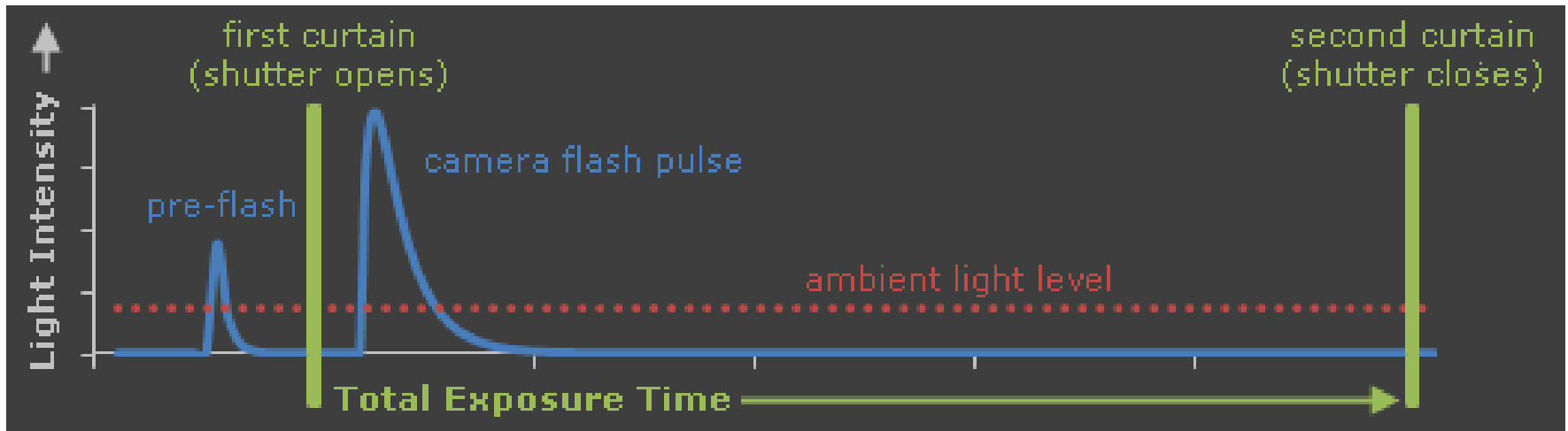
Flash units can rapidly burn through batteries if used extensively. Have plenty of spare (rechargeable) batteries or a specialist power pack



**MANAGING TWO DIFFERENT
LIGHT SOURCES**

THE BASICS OF FLASH OPERATION

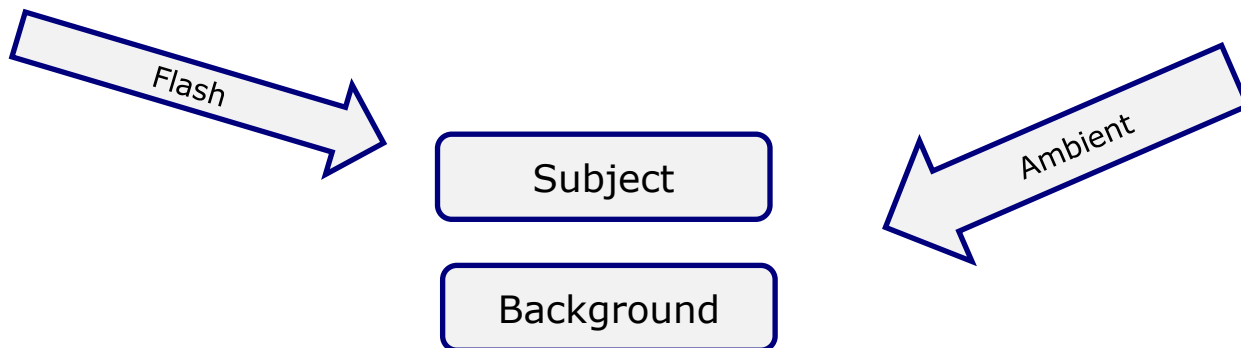
With a flash you are effectively combining two different sources of light



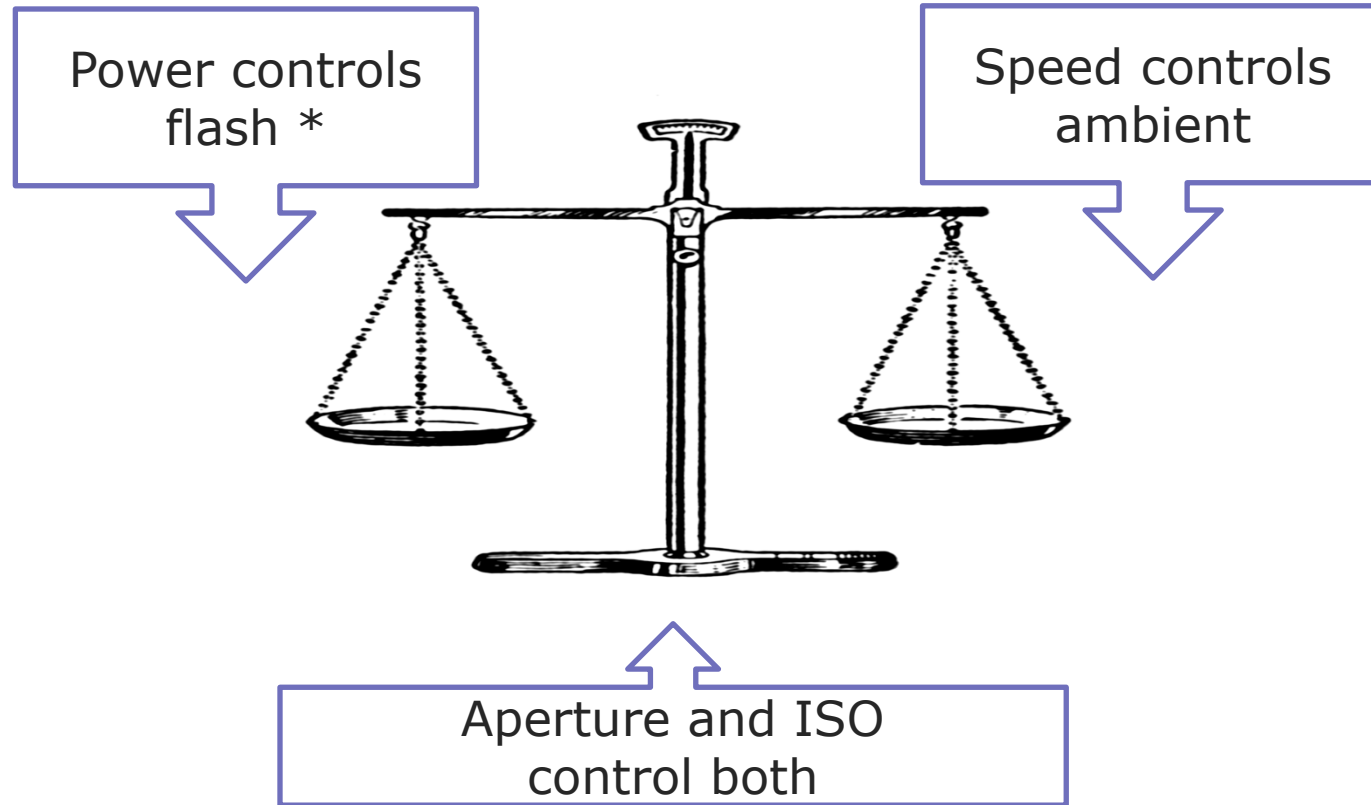
With normal 1st curtain sync

MANAGING TWO DIFFERENT LIGHT SOURCES

- Because you combining two different light sources getting the right exposure balance between the two is critical
- Most cameras allow ETTL (through the lens) control of flash and ambient exposure. This often works well but may also need to switch to manual at times
- ETTL Exposure
 - Both ambient and flash light exposure is affected by ISO and aperture settings as normal
 - The ambient light exposure is also affected by the speed setting
 - The flash light exposure is independent of the speed but can be controlled by the flash power settings



EXPOSURE CONTROL



***Note**

When you adjust the flash power the output remains the same but the duration of the flash reduces

FLASH RATIO



The diagram shows four scenarios of a blue sphere being lit by light sources. In the first, only ambient light (a sun) is present. In the second, a flash is added from the side, creating a 'Fill Flash' effect. In the third, a flash is added from the front, creating a 'Balanced Flash' effect. In the fourth, a flash is added from the front and side, creating a 'Strong Flash' effect where the background is dark.

Flash Ratio:	N/A or 0	1:8 - 1:2	1:1	2:1 - 8:1
	Only Ambient Light	Fill Flash	Balanced Flash	Strong Flash
Settings:	no flash	longest exposure weakest flash	shorter exposure weaker flash	shortest exposure strongest flash

- The key to successful use of flash is thus having the correct exposure balance between the two different light sources
- This is known as the flash ratio
- With a strong flash the background may be quite dark
- The flash ratio can be adjusted
 - For the flash component by changing the power level – with E TTL this is known as flash exposure compensation (typically up to +/- 3 stops on flash and/or camera)
 - For the ambient light component by changing speed setting

EXAMPLE OF VARYING FLASH POWER

Flash exposure compensation (FEC)



The illustrations on this page give a good idea of what Flash Exposure Compensation is all about. Starting from -3 stops all the way to +3 stops you can see what a big difference FEC makes!



Depending on the situation you may need to adjust the FEC up or down

USING FLASH IN MANUAL MODE

- E TTL can work well for many situations but manual mode can also be useful - for example to freeze action by using low power output (see flash duration examples below)
- Set flash to manual, leave camera on auto and adjust flash power to get the effect you want - but may need a bit of trial and error to get right

Canon 580EX

Power	μ s	s
1	4000.0	1/250
2	1088.0	1/919
4	484.0	1/2066
8	266.0	1/3759
16	166.0	1/6024
32	105.6	1/9470
64	71.6	1/13966
128	50.4	1/19841



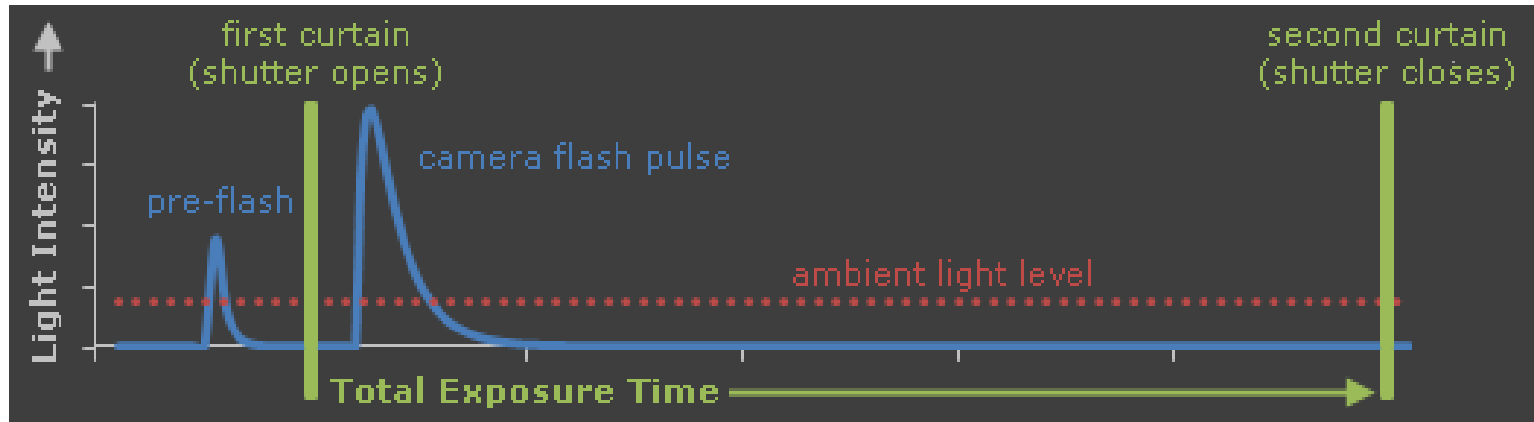
USING FLASH TO FREEZE ACTION

freezing action



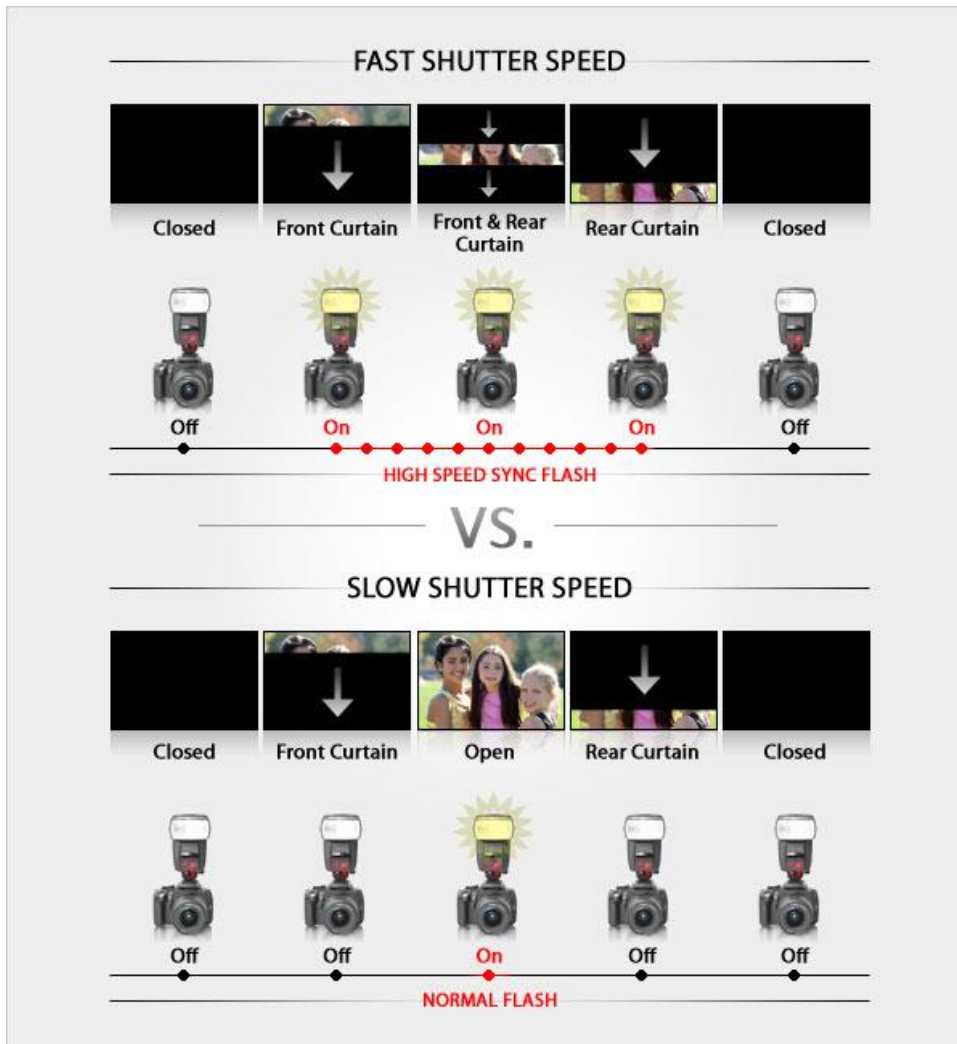
MANAGING FLASH SYNC SETTINGS

SYNC SPEED SETTINGS



- Most cameras have a maximum speed range within which the flash can properly sync with the shutter curtain
- Without this you can get banding in the image due to the shutter being part closed during flash output
- Typical sync speeds are 1/60 to 1/200
- In some cameras you can choose which sync speed is used
 - At low speed the background exposure is increased (more ambient light)
 - At higher speed the background exposure may be reduced (unless bright daylight)

HIGH SPEED SYNC

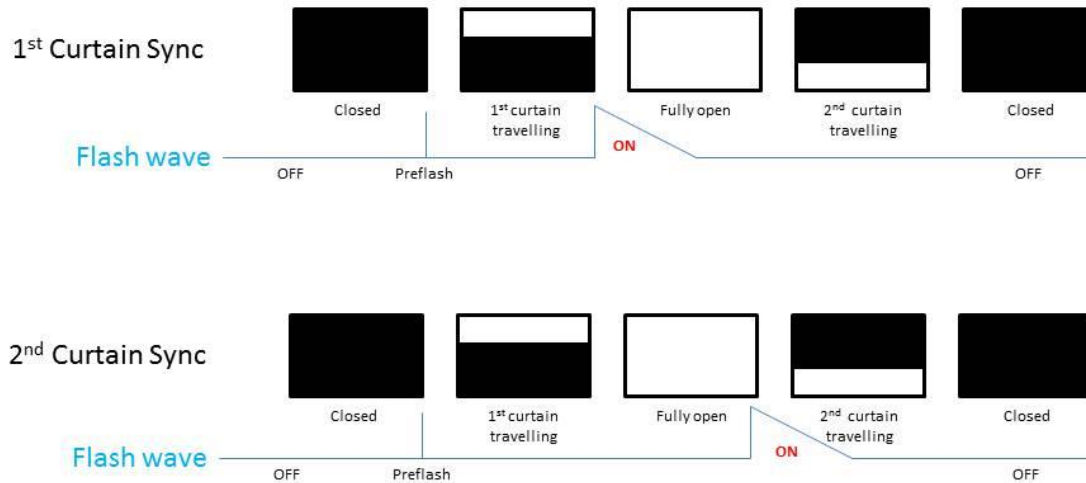


- Normal sync speed is usually between 1/60 and 1/200 to avoid banding
- But some high end cameras/flash units have setting which allows to you to use higher speeds
- This is done by “pulsing” the flash in much shorter bursts during exposure
- But this means the flash power may be reduced

WHY HIGH SPEED SYNC?

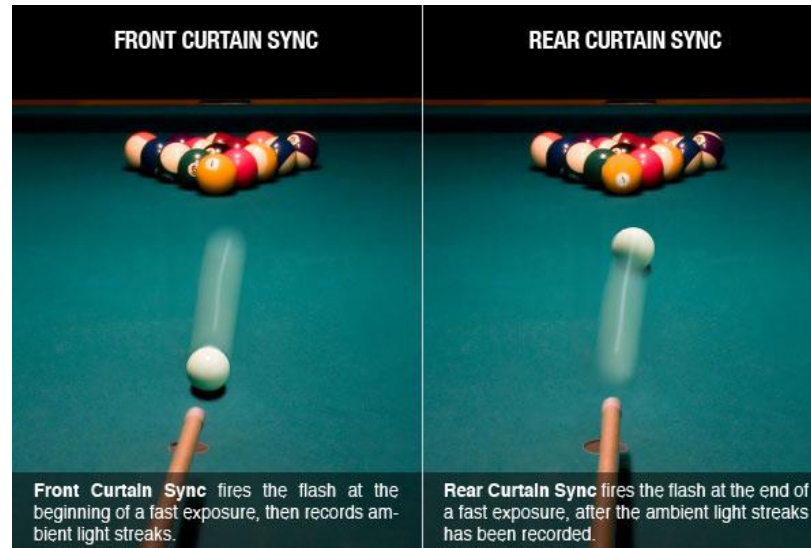
- Allows you to use higher shutter speed (to help freeze movement) but at the same time have some fill in flash to brighten subject e.g. sports or wildlife
- Can also use in bright daylight conditions to allow shallow depth of field e.g. for portraits

1ST AND 2ND CURTAIN SYNC



- Normally the flash is set to 1st curtain sync but there is another option – 2nd curtain sync
- What is it and why would you use this option?

SECOND CURTAIN SYNC



- 1st curtain sync
 - Is fine for most purposes but does not work well for moving subjects in low ambient light conditions
 - Because the flash fires at the start of exposure any moving object appears to be going backwards
- 2nd curtain sync
 - Fires the flash at the end of the end of the exposure and thus creates “light or movement trails”
 - Can be used for a variety of creative purposes
 - Typically best to use tripod with (manual) long exposure for ambient light plus flash

SOME EXAMPLES OF SECOND CURTAIN FLASH





SECOND CURTAIN SYNC VIDEO

SECOND CURTAIN [SYNC](#)



MODIFYING FLASH LIGHTING

AVOIDING HARSH LIGHTING



Direct Flash



Diffuse flash



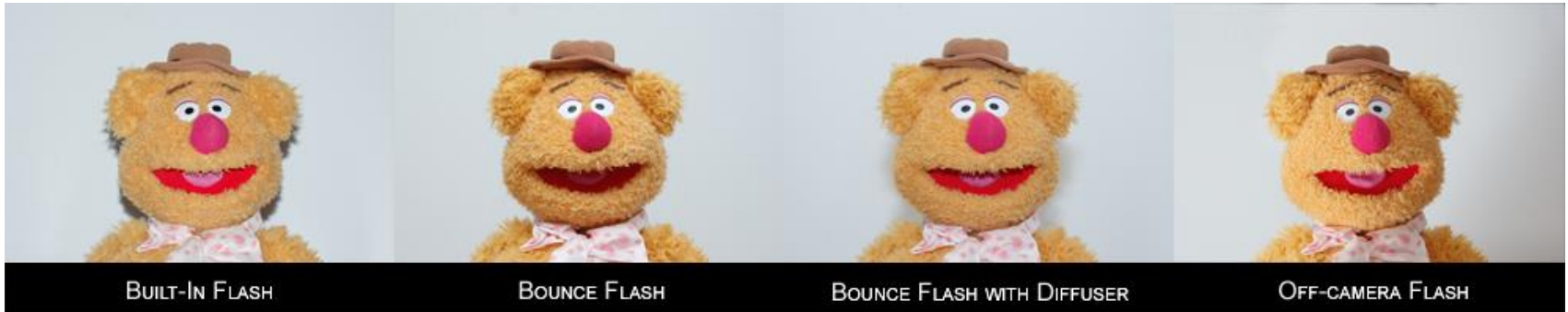
Rule of thumb - light source must be larger than the object to avoid harsh lighting

DIRECT CAMERA FLASH

- Using a camera “built in” or “top mounted” flash can create problems of very harsh lighting and/or “red eye”
- This is particularly the case with a strong flash ratio i.e. when the flash is the main source of light
- Much better to either:
 - Use some form of diffuser to create softer light
 - Bounce flash off nearby neutral coloured surface
 - Or both
- Or use flash off camera
 - On some form of bracket
 - Or within an umbrella or soft box diffuser



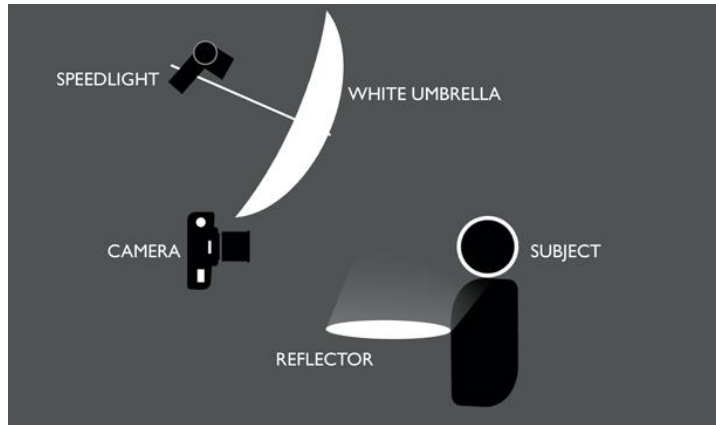
MODIFYING YOUR FLASH



Sunpak 4000AF
direct

With Lumiquest
bounce card

Bounced from
ceiling



STUDIO FLASH



- Flash heads with soft box or umbrella (bounce or “shoot through”) on stand can be used instead of “proper” studio lights
- Can use a variety of options for more creative effects
- Usually cheaper and/or more portable than “proper” studio lights
- Can use one or more flash units
- Wired or wireless sync between camera and flash units
- For wireless can use specialist trigger units or some top range flash units have built in wireless connectivity
- Set up can be as simple or complex as you wish

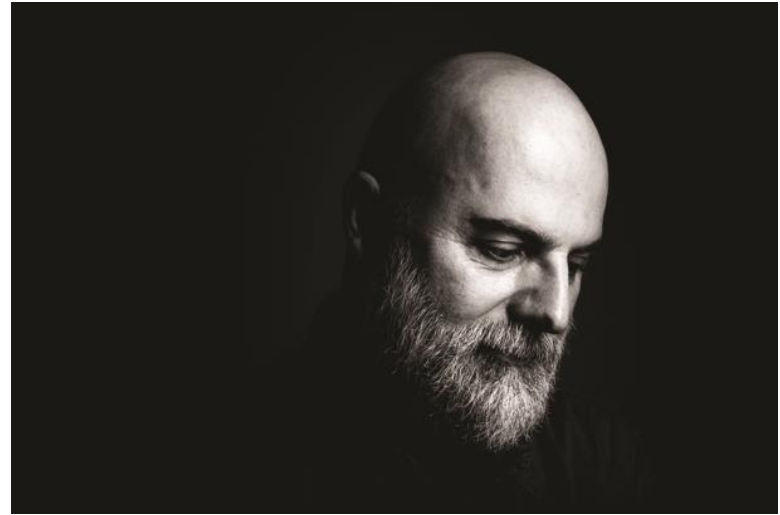
DIFFERENT TYPES OF FLASH MODIFIER FOR PORTRAITS

- Can adjust the “hardness” of light (tendency to produce shadows) using different types of diffuser
- Can also use grids to make the light more directional and/or coloured gels
- Depends on the model and effect you want



FLASH STUDIO - AN EXAMPLE

- Simple low key portraits
- Underexpose for ambient light to get dark background
- Use low power diffuse manual flash to illuminate face
- Make sure that flash does not expose the background



<http://news.dphotographer.co.uk/tutorials/fake-a-dark-background/>

YOUR TURN TO TRY AT HOME!!

- See separate notes with some ideas to try
- Boring - but useful to check your manuals first
- Suggested activities:
 - Different flash diffusion techniques
 - Flash exposure compensation and high speed sync
 - Try other forms of flash modifier
 - Second curtain flash
 - A "flash studio"

Good luck and have fun

*Don't be afraid to experiment with different settings
particularly when in manual mode
- it often takes some time to get the correct balance of exposures*