

Project 1: Focal Length Angle View



Exercise 2.1: Focus set aperture



Exercise 2: Workflow Journey



OCA PHOTOGRAPHY 1
ART OF PHOTOGRAPHY
LOGBOOK

INTRODUCTION
BASIC
TECHNIQUES

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Exercise 3.1 Movement



Exercise 3.1 Movement



Exercise 3.2 Panning



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MY PROFILE

I am a consultant in International Development and travel a lot to Africa, Asia and Latin America as well as Europe and US. My work involves both research and developing training material for people who cannot read and write as well as staff at all levels in development agencies. I get a chance to see many amazing things which most people do not have access to – and many opportunities to really get to know any people I want to photograph. We have been giving training on participatory video as part of a change process. I also want to establish processes for collaborative photography as part of peoples' own documentation of their lives.

I am simultaneously studying for all 4 of the Photography 1 courses and aiming to follow the degree path.

Previous photography qualifications/ courses:

I did ICS City and Guilds Photography correspondence courses in both video and photography in 2003 – before digital. I also did a course in Photography Marketing with Bureau of Freelance Photographers. And I have done quite a lot of digital photography since for websites, reports etc. But I have a lot to learn before I can take the sort of photographs I really want to – either for work or as art.

Equipment/software:

I have just bought a Canon G12 camera which I am very pleased with, and I am proposing to use that for most of the level 1 courses. I also have an EOS D20 but it is much more difficult to fit in my suitcase these days with all the security and it does not have things like histograms and previews on the LCD screen. I am considering upgrading my SLR when it is my birthday in May.

I have Adobe Master Suite CS4 and Adobe Lightroom 3 and am familiar with Photoshop and Bridge as well as Dreamweaver and InDesign.

Other relevant interests:

I also draw and paint. I have completed OCA level 1 Drawing, Watercolour and Painting courses in 2012 but then decided to change to Photography. A Photography degree at this stage is much more useful for my work and will open up quite a few new possibilities alongside my core consultancy work, and is much easier to fit in with my travel. In the longer term it will also be an important component of my art - I expect a lot of interesting parallels/contrasts between the two. I am also doing the OCA Graphic Design course over the next two years.

I design and manage simple websites for my work – I shall be completely updating these over the next few months and will be transferring all my work materials to a new website, leaving my own personal website now for my creative pursuits – including OCA Photography - and family.

MY PHOTOGRAPHY GOALS IN THIS COURSE

I have a number of rather separate goals in this course, which I expect will increasingly converge:

Work:

I want to explore ways of taking images of people and places in a way which increases understanding of other cultures. This links to my other course People and Place. A lot of photography from other cultures is voyeuristic, portraying the exotic or the shocking. This is true to some extent even of many well-known photographers. I want to work photographically with people I know through my work and help them have a voice to say what they want to say about their lives.

Personal:

I'm very interested in people and portraits and how photographic skill can be used to show different dimensions of people.

Artistic:

I am fascinated by light, colour and design as things in themselves. I want to increase my technical and also artistic skill to portray the world as I see it - a world where there are amazing things even in everyday things we take for granted. In many ways I find this more satisfying and important than photographing things which are in themselves generally recognised to be beautiful.

I have not studied photography industry in detail and looking forward to extending my understanding and knowledge. My main photographic influences at the start of the course:

- Lee Miller - I went to see an exhibition of her work in Paris and am really interested in her use of light and design in the way that she portrays places.

- Nan Goldin

- Don McCullin

- Seydou Keita

- Gerhard Richter

!!!To be finished

My camera is a Canon G12 compact camera with full manual control.

I got the Manual from the Internet.

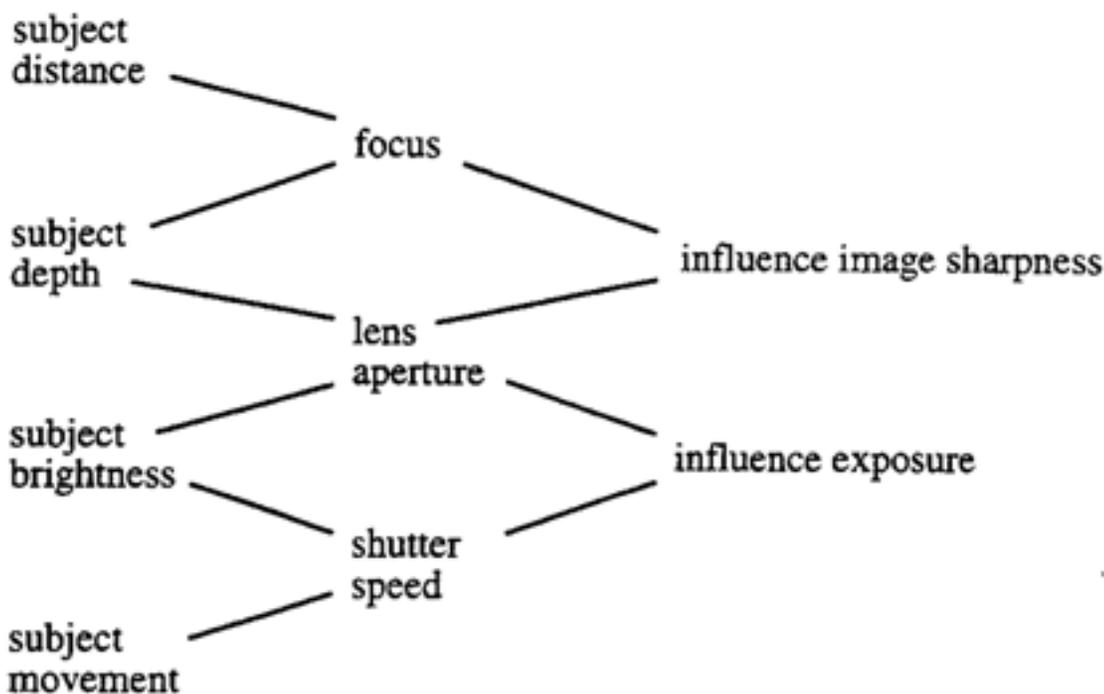
I also came across and bought:

Carlson, J. (2011). Canon Powershot G12: From Snapshots to Great Shots. Berkeley CA, Peachpit Press.

This is very useful in going beyond the technical details and how these can be used in practice.

BASICS: GETTING TO KNOW MY CAMERA

There are four basic subject conditions to be considered when deciding the best way of taking the photograph. These are mutually dependent on each other:



Aperture	Light requirement	ISO sensitivity	Detail	Shutter speed
Large	low	slow	good	fast
Small	high	fast	lower	slow

Aperture

In the aperture diaphragm a set of curved blades close and open in synchronisation to give different sizes of circular apertures. Each main step halves or doubles this opening, so halving or doubling the exposure.

MAXIMUM APERTURE

The diameter of the beam of light the lens transmits determines the maximum brightness of the image it projects onto the film.

RELATIVE APERTURE: f/NUMBER

The ratio of the focal length (F) to the diameter (d) of the lens (F/d). Relative aperture is expressed as numerical value, f/number. It indicates the same image brightness with lenses of all focal lengths.

f/numbers are fractions and a bigger number is therefore a smaller aperture. f/4 gives twice the exposure of f/5.6, four times the exposure of f/8, eight times the exposure of f/11 etc.

f/stops

1.4	2	2.8	4	5.6	8	11
16	22	32				

In bright light we seldom need a lens which is larger than f/8 but in dim light we need a larger aperture of at least f/4. To work in very dim light, we may need an aperture of f/1.8, f/1.4 or f/1.2.

Reduction of the aperture allows us to control exposure and also has an effect on the range of distances which are imaged sharply.

Stops

f/numbers and shutter speeds are both referred to as stops. 'Increase exposure by two stops' can be taken to mean increase exposure by four times using:

- a larger lens aperture, such as f/2.8 instead of f/5.6
- a slower shutter speed 1/60 instead of 1/250
- a combination of both, 1/125 @ f/4

Shutter speed

The shutter is the means of controlling the duration of the exposure.

Shutter speed is the time interval between opening and closing the shutter during which the film is exposed the image projected by the lens.

Shutter speeds are written as fractions. 1/30 is twice the duration gives twice the exposure of 1/60 and is 4 times the duration gives four times the exposure of 1/125 etc

Shutter speed scale

1 2 4 8 15 30 60 125 250 500
1000 2000

B (bulb) setting keeps the shutter open long as we keep the shutter release button pressed - useful for exposures of several seconds.

T (timer) setting opens the shutter the first time we press the release and holds the shutter open until the pressed the released again - useful for exposures of several minutes.

Exposure

Exposure is represented by $I \times t = e$

NB written eg 1/100 @ f/8

There are two ways of controlling exposure:

- adjusting the lens aperture to limit the image brightness
- adjusting the shutter speed to limit the duration of exposure

IN-CAMERA METERING SYSTEMS

- Evaluative metering used for general subjects. The exposure setting is based on the focusing point in use, taking into account such factors as subject size, position, overall lighting level, front lighting and back lighting.
- Spot metering used when there is a big difference in brightness between the main subject and the background, or for subjects that require precise measurement, such as close up photography. The metering area is limited to the central part of the viewfinder (approximately 3.5% of the image area).
- Centre-weighted average metering metering is averaged over the entire scene with emphasis placed on the centre area.

Exposure must take into consideration the levels of contrast between different objects in the picture. The contrast between most subjects is not likely to be more than the equivalent of the difference between four stops.

- Subjects with a large brightness range e.g. room interior with a sunlight view, dark objects in the shade into southern white wall, white objects in the sun against a background in the shade, landscape in the shade with white clouds in the sky, sunset behind buildings etc. Here we may have to give two stops more exposure for dark area and two stops less for the bright area.
- Subjects with very low contrast e.g. flat lighting on landscape on buildings, misty atmosphere. Then we have much more exposure latitude to one or two extra stops.

The lens

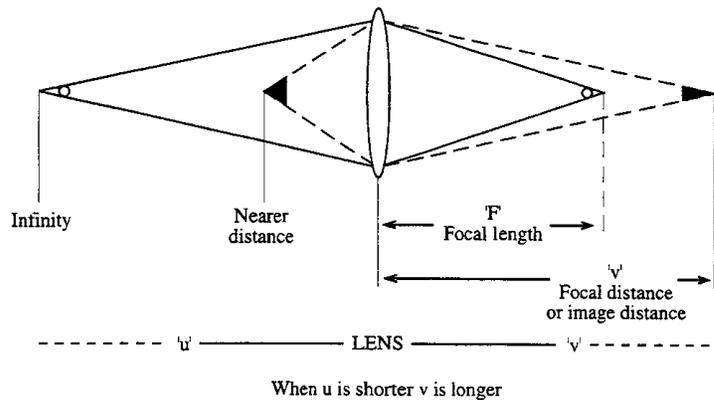


Fig 4.3 – Focusing on a near object

Lens Terminology

Aspect ratio : shape and size of the frame. Most common (and best setting) for digital cameras is 4:3. Full frame (35mm equivalent) is 3:2. Other proportions are 16:9 (widescreen) 1:1 (square) and 4:5 (vertical).

Focal length (F): the smallest lens-to-CCD sensor distance (v) must be in order to make a sharp image. Focal length is determined by the curvature of the lens. It is measured in millimetres. Standard focal length is 20-25mm with 4:3 frame and with full-frame 3:2 is about 40-50mm. A smaller image needs a shorter focal length lens (wideangle). A larger image needs a longer focal length lens (telephoto).

Angle of view : a geometric ratio between the focal length and the aspect ratio, and determines the amount of the subject included in the image. It is usually considered most convenient if the angle of view of the camera lens is about the same as our eyes ie about 50°-53°. This is obtained when the focal length is approximately equal to the diagonal measurement of the aspect ratio.

Focal plane: the plane in which the image is focused. This is at right angles to:
 optical axis : the centre light passing through the lens
 real image: the image formed on a flat surface in the focal plane we can see .

Focal distance or image distance: the lens-to-film distance (v) at which any object nearer than infinity produces a sharp image. The sharp image of an object near the camera is focused further behind the lens than the image of a distant object so usually requires a shorter focal length (wideangle).

When the lens-to-subject distance (u) is equal to infinity, the focal length is a fixed measure, whereas focal distance varies with the object distance. The focal distance, as a proportion of u, determines the scale of the image.

Focal length and angle of view are related. E.g. for a 35mm camera a 50 mm lens will have an angle of view of approximately 45°, a 28 mm wide-angle lens around 76°, and telephoto lens of 500 mm only 5°.

My camera

Lens has a 5x optical zoom from wideangle 6.1mm (28mm focal length equivalent) to telephoto 30mm (140mm focal length equivalent) .

At maximum telephoto of 30cm maximum aperture is $f/4.5$, minimum aperture $f/8.0$

At maximum wideangle maximum aperture is $f/2.8$, minimum aperture is $f/8.0$

Shutter speeds range from $1/4000$ to $15''$
no B or T setting???

Minimum focusing distance

Macro

FOCUSING

Autofocus normally focuses only on the centre. A quick way of focusing is to put the centre of the frame on the object, press the shutter half way. Then recompose and take the shot.

The G12 has 3 autofocus modes:

Flexizone which allows you to move the centre of focus.

Continuous AF where the camera continually scans the scene and focuses on objects until the shutter is pressed half way. This speeds up focusing on action shots, but rapidly depletes the battery. With this off the camera only focuses when the shutter button is pressed half way.

Servo AF gives continuous focus only when the shutter button is pressed. AF frame appears as a blue outline. You can also use the frame selector to select point of focus.

For action I can also use the continuous drive mode.

PROJECT

Point the camera at a scene and keep both eyes open - one eye looking through the viewfinder, the other at the scene.

With aspect ratio 4:3, at standard focal length 20-25mm the two should be about the same. Check this, take one photo and make a note of the setting.

Then put the lens to the smallest wide angle and shoot a second image. In Canon GX this is 30.5mm.

Then put the lens to the longest telephoto and shoot a third image. In Canon GX this is 6.1mm.

Print all 3 photos onto A4 paper. Stand in front of the same scene at the exact position where you took the photograph and hold the 'standard' print in front of you at eyelevel. Move it towards or away from you until the printed scene appears the same size as your view of the real scene.

What is the distance? Should be a comfortable viewing distance.

Wide-angle - will need to hold much closer.

Telephoto further away.

But effect of glasses? longsighted etc???

STILL TO DO LAST PART

There are though issues here as the brain compensates for differences in size. So it is somewhat subjective/arbitrary what one decides is the same size as what when viewed from a distance - the reason why photos are sometimes disappointing because they don't show things as we think we see them - distant objects look much smaller in 2D than we think in 3D.

PROJECT 1: FOCAL LENGTH AND ANGLE OF VIEW



This was the distance at which the two images looked the same - very near the maximum telephoto of 25 cm.

This is the close-up at 30cm.
The objects look a bit larger.

There is a digital zoom, but this
reduces image quality. Only use
this when absolutely necessary
if any shot is better than no
shot.



Wideangle 6.1cm. The objects
look much smaller.

The wide angle on the G12 is
quite powerful - equivalent to
28mm on a 35mm camera.

Medium focal length 18cm.



PROJECT 2: FOCUS



When you focus on something, its image is made sharp. If you focus beyond or in front of it, the image will look soft. If there is great depth in the picture from foreground to background, decisions need to be made about how much can or should be in focus.

If there is considerable depth in the picture, focusing on the main interest point means that much of the scene will be out of focus.

Focus f/2.8 near - on the graffiti. I quite like this shot - but maybe the figure is a bit of a distraction. It might have been mor powerful to focus on the ice right to the front. Focal length 6.1mm

Focus with a set aperture



Focus f/2.8 Middle. This was focused on the back of the front puddle. But actually shows reasonable focus on the figure at the back. I think actually this is the best shot.



Focus f/2.8 distance - here the background trees are marginally sharper. The figure is not significantly sharper because it has moved further away. There is also less ocntrast in the image.

f/2.8 widest aperture. This gives good sharpness and attracts attention to the middle pillar and sharp shadow on the back of the puddle.

EXERCISE

Focusing somewhere near the middle take 1 picture with the lens at its widest aperture, the second at mid point and the third at smallest aperture.

Make prints, number and compare.

I enlarged in Lightroom instead.

Shot at focal length 6.1

I should have used a tripod to get exactly the same composition.
Repeat this???



Focus at different apertures

Hyperfocal distance

You get a much greater sharpness of image if you focus about 1/3 into the photo.

NOTE the wider the lens, the greater the depth of field you can achieve. And the nearer the HFD.

The minimum apertures on compact cameras are quite large ie f/8 compared with f/32 on some SLRs. This decreases the depth of field which can be achieved.



Focus f/8 middle gives a better sharpness on the near objects. Far objects are similar.

PROJECT 3: PHOTOGRAPHING MOVEMENT

The shutter speed controls not only the light - and so exposure - but is a key element in determining the sharpness of focus. It affects the level of camera shake in images taken without a tripod. It also affects the way in which subject movement is captured and can be controlled for artistic effect.

The amount of subject blur depends on:

- speed of movement of subject: Here creative decisions can be made as to whether or not the subject motion should be frozen or deliberately blurred to provide enhanced impression of movement. In considering shutter speeds it must be borne in mind that many action subjects also have secondary movement that may be more important than subject movement e.g. legs and arms in a walking person. Many actions have a dead point e.g. pole vaulter at the top of their leap etc. Where motion is to be exaggerated a slow shutter speed combined with panning will blur the background rather than the subject or as well as the subject.
- angle of direction of movement: if the movement is passing diagonally across the field of view there will be less movement of the image of the new shutter speeds half the speed of those suggested above. When the movement is directed towards the camera, image movement is very slight and we can use even slower shutter speeds to obtain a sharp image.
- distance of the subject from the camera if the subject is far away from the camera image movement will be less, in proportion to the scale of the image, than when the subject is close, and we can use shutter speeds half, or even a quarter, as fast.
- steadiness of the camera: as a general rule shutter speed should be at least equal to focal length of the lens. Slower shutter speeds are possible with lenses of shorter focal length. Long telephoto lenses will generally require a tripod unless they have image stabilisation.

SOME TYPICAL SHUTTER SPEEDS

Speed of subject	Shutter speed
To blur movement of water	4 sec to 1/8
Sharp image of stationary subject	1/30
Freeze a moderate amount of movement	1/125
People walking	1/250
Shooting from a moving vehicle	1/250 – 1/1000
Sharp images of action subjects	1/500-1/2000
To arrest the movement of a racing car at high-speed	1/1000/2000

Speeds for panning:

1/500 or 1/250 for motorsports

1/125 for cyclists at full speed, race horses and traffic at average speeds

1/60 slow moving traffic and bikes and joggers

1/30 walking speed

(letter in Photography Monthly 2001)

If the shutter speed indicated for the required exposure is slower than 1/125 and there is possibility of camera shake, we can:

- use a tripod
- use a faster shutter speed but within the exposure latitude of the ISO setting
- use a larger aperture and sacrifice some depth of field
- use a higher ISO setting, but with possible increase in grain and noise.

If the shutter speed indicated is faster than 1/125 and the subject needs a slower shutter speed, we can consider using:

- a smaller lens aperture (but G12 only goes to f/8)
- an ND filter to reduce image brightness (the G12 has one of these in the functions)
- a lower ISO setting

Where there is normal or bright light, to maintain the correct level of exposure with very slow shutter speeds it may be necessary to the lowest ISO settings, a neutral density filter as well as a small lens aperture.

The image stabilisation on the G12 enables reasonably steady shots at about 4 stops lower than normal - 1/8 or even 1/4 at wideangle.

Shutter speeds: water and birds



1/1000



1/250



1/200



1/60



1/40



1/20



1/13



1/10



1/6

- **Birds**
- **f/100 gives a good blur on the wings in flight**



• f/20

- **Birds f/250 freezes most flight**



Shutter speeds: streets and people



MOTION BLUR

1/8 completely loses a bicycle as it goes past - becomes just a ghost.



1/6 can be quite sharp and acceptable photo at small sizes. If the subjects are almost stationary.



1/40 keeps reasonably still even at telephoto.



1/40 retains more



1/8 gives quite a bit of blur on movement.



1/40



1/40 still shows quite a lot of blur on a runner.



1/40 OK for diagonal movement, with blurred feet.



1/50

1/60 sec almost freezes the movement of these two people. I like the way their position sort of echoes each other.



1/60 makes this woman quite sharp, but blurs her foot though she is walking. This shot was a static version of the panned one overleaf.

Again 1/60 sec. This shot is not sharp - it is slightly panned to follow the woman and gives a sense of her haste.

I could play around a lot more with this concept - having the subject blurred against a sharp background - given the fact that any other people are likely to be moving at different speeds and angles to the camera.

Compared with panning to keep the subject as sharp as possible against a blurred background.



Panning



I found this difficult at first, but then switched off the continuous shooting autofocus mode. This keeps the subject relatively sharp. And although the first and last shots are usually not any good, it enables you to follow through with the movement.

I use the LCD screen because it is quite difficult to compose. But with hindsight maybe I should try using the viewfinder in future and turning with my whole body.

Some interesting effects.

It is very difficult to get real sharpness in the figure. But sometimes the motion blur with the panning can be quite interesting in itself.

Something to practise more and see how I can use the range of effects here.

1/30 sec gives reasonable sharpness here. I left enough space for the cyclists to move into, and I quite like the tree in the middle. The tree branches are interesting.



1/30 sec

Again I did not move at the right speed for sharpness. But I quite like the motion blur here.

Still 1/30 sec.

This is relatively sharp because the cyclists are coming towards me - the beginning shot of the pan.



1/30 sec. This close up is quite effective I think and the blurring just about right.

Again 1/30 sec.

Here the motion blur gives a sense of speed.



Panning continued



1/30 sec

I like the composition of this - plenty of space to move into

Here I moved too fast - with a very interesting shape in the hat. Maybe I could use this to artistic effect sometime.



I found this one quite interesting - I focused on the front of the van, and this is quite sharp, whereas the back of the van is blurred.

It was shot at f/8 @ 1/30 but the picture has a lot of depth and the camera must focus on a fairly tight area.

Images on this page were done at 1/60 sec.

Here panning in one direction can create a sense of speed even in someone walking. I like the way the panning makes the woman stand out clearly from the background



This is quite interesting - panning in the direction of the cyclist makes the cyclist sharper than the person walking in the opposite direction.

The front of the cyclist's face here is quite sharp which gives him a clear direction. I am quite pleased with which one in terms of the sense of speed.

I need to think about the background more.

