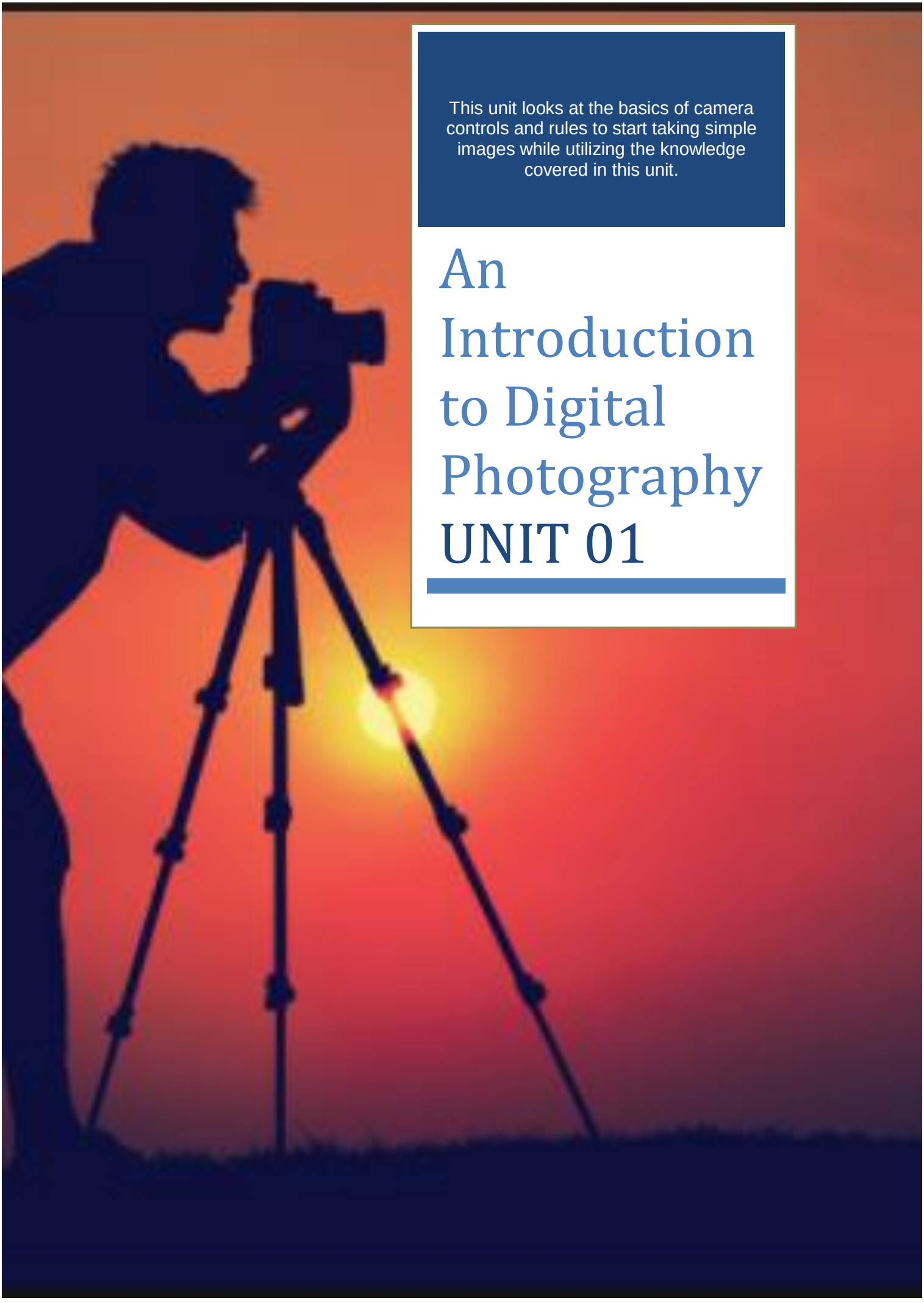


This unit looks at the basics of camera controls and rules to start taking simple images while utilizing the knowledge covered in this unit.

An Introduction to Digital Photography

UNIT 01

Unit 1 - Content

1.0 An introduction

This unit looks at the basics of camera controls and rules to start taking simple images while utilising the knowledge covered in this unit. Students will understand the history of digital photography and what equipment they will need to suit what level they would like to progress to in photography. Students will understand aperture, exposure compensation, and depth of field to be able to use these in a single image. The sections covered include:

- Progressions of Digital Photography
- Equipment and Accessories
- Aperture
- Exposure Compensation
- Depth of Field.

1.1 The history of digital photography

Digital photography has evolved in quite a short space of time since the first digital camera was invented in 1969 by George Smith and Willard Boyle. They developed the Charge-Coupled Device (CCDD). However, digital photography as a whole mainly developed around 30 years ago as a need for space exploration.

George Smith and Willard with CCDD

Technicians faced the problem of how they were going to send images across vast distances, as film and analogue photography were not possible modes of delivery. They then wanted to send visual information and developed it into the binary computer code, which is where we get the term digital imaging from.
The images that we see are made up of very tiny image pixels which contain this information. As a photographer, you will usually only see this as how many pixels per inch there are, so that we can determine the image quality and whether or not it can be edited, sent, or printed in large formats.

Digital images differ quite considerably from previous photographic formats. Conventional photographs register intensities of light through the physical changes in the chemicals, but the digital image format is when light is electronically translated into code. When we later look at aperture for digital images, it talks about the light hitting the sensor and in turn being read into digital codes.

Whereas film used to take several attempts to get this process right and sometimes hours to process without you even knowing what it looked like, digital imaging can be seen instantly. Namely, you can see where you are going wrong and try again straight away. This is a vast breakthrough from previous photographic formats. Now you can change images to sepia, monochrome, or a negative style at a few clicks of the mouse, and digital cameras can shoot straight in black and white if you choose.

1.2 Evolution of photography

Photography has taken some quite large leaps since developing through the ages into digital photography. Here we can take a look at a step by step guide to the development:

1826 – Heliograph: Here the first image was created using a bitumen that hardened when it was in contact with light. The plate was then processed with lavender oil to remove the excess bitumen. This was created by Joseph Nicéphore Niépce.

Heliograph image

1838 – Daguerreotype: This was a photographic process which had a polished surface of silver that was sensitised by the vapour of iodine crystals. Once it was exposed, the plate was then developed by the fumes from heated mercury and fixed. This process was invented by Louis Jacques Mandé Daguerre.

Daguerreotype image

1839 – Calotype: Only a year later, William Henry Fox Talbot invented the Calotype, (He used a process of a negative and positive system. The paper negative, which was made of sensitised paper, was then exposed, developed, and fixed. The image was placed together with another piece of sensitised paper, which in turn was exposed and processed for the positive print.

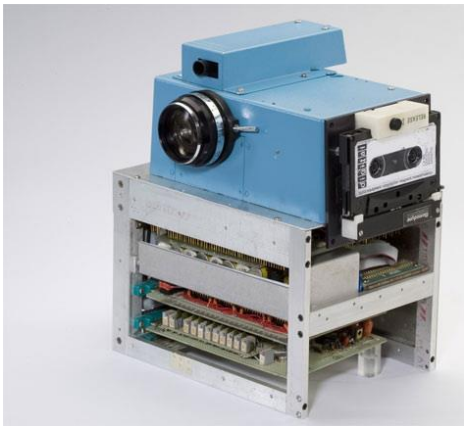
1851 – Collodion: 12 years later, the collodion wet plate was made. This combined the details of the daguerreotype with the calotype process. This used glass plates coated with a sensitised emulsion, which was then exposed and developed while it was still wet.

1880 – Roll film: During the 1880s, George Eastman popularized photography by putting it on the map with developing the roll film, which was seen as the new, simple camera system that quickly replaced the developed plate process.

1935 – Kodachrome and Agfacolour: This introduced the new colour system. The two films made it possible to have high-quality colour images produced relatively quickly compared to its predecessors.

1963 – Digital camera: D. Gregg invented the first digital camera before CCDD. This was a videodisk digital camera that could capture and store images like never before.

1986 – Megapixel CCD camera: This CCD sensor was invented. Kodak designed and created this sensor that had 1.4 million pixels.



Megapixel CCD camera

1990 – Commercial digital camera: The first digital commercial camera was created, only starting in black and white initially and then moving into the development of colour. Kodak was the first to provide these for the professional photographer.

2000: Only in 2000 did there become the mass production of the digital camera, where any level of camera would be created for the mass market, from compacts to full SLR cameras.

2012: Now we are seeing the development of the armature camera into a semi- professional, with vast new technologies to allow almost anyone to become a photographer in the home.

Not only have the cameras in digital photography evolved dramatically, but the software has too. One of the most complex programs, known as Photoshop, allows you to clone parts of an image and place it somewhere else on the picture, remove lines, add makeup where there originally was none, and, in theory, change an image completely compared to what was originally shot. Some people who still prefer the old-school system will argue that this is not photography but more manipulation, as you do not work much on an image compared to an old film or negative format.
However, avid digital photographers will spend hours editing one image, so they are still spending as much time and effort on their craft.

Nonetheless, the new technologies are having some impact on the traditional ways in which our world carried out a few things. Documentary photography is one of these examples, where the new superhuman technology of our current age allows manipulation of the images without leaving any evidence that this may have happened. This means that criminal evidence can be tampered with and the authorities may not know which version is correct. Photography used to be seen as a reality test; now, however, unless you are fully aware of the digital photograph's capabilities and the endless editing procedures, then you cannot be fully sure what is true and what is not. It can be very hard to see where an image has been tampered with or not.

Being able to almost have limitless ability to change and mould a picture is good for creative expression, but has it created problems in our everyday world?

With modern technology, an image can instantly be made available to the world and shared by several others. Later, in Unit 4, we will look at how social media can be beneficial to photographers for networking and getting your work out there. On the other hand, if an image is not meant for the public eye and it appears in our digital age, it can be hard to remove if the intended purpose was not for viewing.
Everywhere you turn on the internet there is an image for everything: Google Maps can now be in pictures, and your whole life history can be documented online in pictorial format.

With the extent of image alteration in digital photography, the fashion and editing industry has come under close scrutiny about depicting images that are unachievable to our younger generation. With the cloning tool, airbrushing, and the ability to change face and body shape, the aspirations of young women and men are said to be unattainable. This has been said to have led to increase self-esteem issues and eating disorders in younger and younger people. But can we fully blame the photographic industry for this? Some argue that is has been the development of the tools of the trade that has allowed the fashion industry to alter the images as they wish, in a sense using a creative tool for other purposes.

1.3 Photography and art

Photography has not always been considered an art form. It has come under direct scrutiny from server artistic areas claiming that a camera is not classed as a medium to be used nor the output. Others have widely disagreed.

"The blurring boundary between photography and contemporary art was determined not only by the changing oeuvre of photographers but also by the fact that photography was used by other artists as a medium for implementing their own creative ideas." (T. Pabedinskas, 2010:4)

However, digital photography has taken some dramatic leaps in the technique and execution of its practice, and we now have conceptual and artistic photographers. These people create bespoke and stunningly real images that are not unlike works of art, and they are becoming more and more recognised.

With the help of improvements in technology, people are able to create quick images on their phones and compacts, allowing the everyday person to become his or her own photographer. Some argue that this is leaving professional photographers obsolete. It has been shown in our current economic climate and financial situation that professional photographers are having to work even harder to earn their profession: the ever-increasing technology available at everyone's fingertips is becoming a tool for people to take photography into their own hands and render some professionals obsolete for a time being. Fortunately, there are still a number of people who recognise the talent and quality involved in the traditional professional photographer.

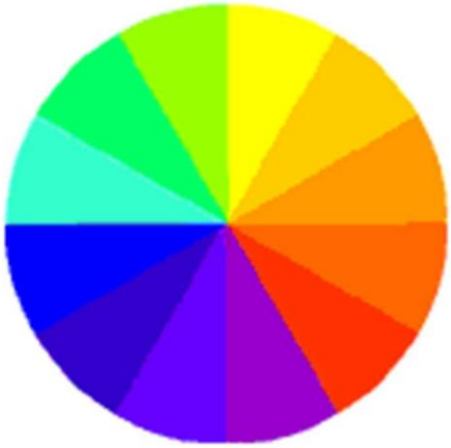
Digital photography has evolved dramatically and will continue to leap forward with our ever-changing technologies.

1.4 Traditional and digital photography

The current digital photography has often been compared with the old and tested traditional techniques that we have explored. Film cameras are sometimes preferred methods for some who wish to keep the timeless method alive but also like the style and effect that the film gives images. However, when we look more closely at the modern-day digital camera, there is less difference from the film cameras than first thought. Both digital and film cameras have the lens, viewfinder, shutter, aperture, and a place to record the image. The main difference is that digital cameras record the image onto a digital sensor rather than the film, as in the old film cameras.
If you are worried about not having the finances for a big, sophisticated camera, do not be put off, as all cameras have to follow these designs. Even if you purchase a lower-grade camera, the process will be the same. This is what has made the modern-day camera, and photography as a practice, more accessible.

One of the main changes that can be looked at from film to the digital camera will be the sensor. This is the Charged-Coupled Device (CCD) mentioned earlier, which was developed by George Smith and Willard Boyle. As we will look at further throughout the course, the sensor is a device that measures the amount of light that hits it. This then is affected by what aperture setting you have, so if less light is available then less light will be hitting the sensor, resulting in an out-of-focus image. The colours that can be seen are made up as red, green, and

blue (or RGB, as you will become familiar with once you start looking at colours and Photoshop). If we look at the colour wheel, we can see that there are many different colours, so it can seem odd that this is such a basic set.



The RGB system has been used since the beginning of colour photography and has been transferred to our digital predecessors. The RGB was first looked at when it was seen that an image could be photographed by shooting it on black and white film through red, green, and blue filters.

R	G	R	G	R
G	B	G	B	G
R	G	R	G	R
G	B	G	B	G
R	G	R	G	R

The images were then projected together through the same filters, where the colour scheme could be recreated. We have come a long way in our digital age, but the RGB colour scheme is still used. In modern digital photography, this process has been modernised: the files are produced as RGB, containing the same colour information for the scene in three separate black and white channels relating to each colour of red, green, and blue. As the viewer, we then see the file on screen or printed in the three separations which are recombined to form a full colour image.

Since digital camera development, we have seen the quality and resolution of images increase as time has progressed. Back when digital photography just started, resolution could be measured in hundreds of thousands of pixels, which was an impressive feat. In our modern age, we are shooting at more than 6 million pixels. This has allowed for a much sharper and crisper image, and it has also improved digital printing quality. Pixels will be looked into further in the printing section. The sensor resolution is measured by a pixel and is a sample that is taken by the CCD sensor during the image taking. The resolution of the sensor is measured by seeing the number of pixels widthways by the number of pixels in the height. These measurements are then multiplied to get a sensor with roughly 2 million pixels, resulting in a 2-megapixel sensor. You will see this written on boxes when purchasing a digital camera.

References

Thomas Pabedinskas (2010). *Contemporary Lithuanian Photography: Relationship between the Image and the Identity of a Person*. Lap Lambert Academic Publishing, AG & Co.KG. Saarbrucken: Germany.

2.0 Accessories and Equipment in photography

Once you start looking at digital photography, the range of equipment and accessories can be overwhelming. The thing to remember is to not get bogged down by technology speak and over-inflated pricing. Instead, what you must look at is your intended purpose.

Some questions to ask yourself will be:

- What do I want to photograph?
- What is my intended budget?
- I will I be looking to upgrade after a year?
- Will I want to turn professional after a year or so?

We can look into these in a little more detail:

2.1 Things to start

2.1.1 Buying your stuff

If you look at this question, it will allow you to figure out what sort of starting kit to buy. If you are looking at only taking family images and getting used to your camera settings for a year or so, a mid-range SLR (Single-Lens Reflex) camera will usually be sufficient. If you are looking at starting off, shadowing other photographers, and building a solid portfolio from scratch, you may want to look at investing in a semi- professional or professional camera body.

Investing in a fairly decent off-camera flash will also be a good idea. Whether you are looking at only family or professional images, this will benefit both causes.

2.1.2 Matching your Budget

If you only have a budget of around £500-£600 and are looking at turning semi- professional, it may be good to wait a few months until you can save up a little more capital and invest in your professional body. You can purchase the camera body, but make sure you invest in the right lens.

If you have a budget of around £400 for just family and friends photography, this can allow you to purchase a nice mid-range SLR camera.

2.1.3 Intend to upgrade in future

If you are looking to upgrade within a year and have already spent around £1000 on kit and accessories, you may need to ask why you are upgrading. If it is to just buy a new lens, make sure this lens will add to your kit and won't just be a lens you use now and again that has cost around £600. Make sure that each investment in your kit is worth the money you pay for it.

2.1.4 The decision of turning into professional

If you have invested in a mid-range camera and then decide to go professional after a year, you may want to add to your kit gradually as you go, finally upgrading your camera body once you have invested in the correct lens for your intended use.

2.2 Accessories you need to know

2.2.1 Tripods

Once you start taking more images, you will find yourself desperately in need of a tripod. Those little pieces of kit do become invaluable and can save you time in your editing afterwards if you are forever correcting wonky horizons or adjusting blur.

They allow for you to position your camera where you want if you do not wish to photograph hand-held or if you need to do some remote images with a trigger while you are not behind the camera. Alternatively, in low-light images, you will need something more than a steady hand, which is where your tripod comes in. Many wedding ceremonies may be conducted in this way if there is poor lighting in a dark church. You will then use your tripod for stability.

These do not have to cost you an extortionate amount of money and can easily be bought cheaply second hand. Once you have found one that suits your needs and your personal taste, it's most likely that one will stay with you during most of your shooting days.

2.2.2 Camera Bags

Your camera bag will be a reliable piece of equipment and just as important as the photography equipment itself. Having a sturdy and supportive camera bag will be beneficial in the long run. Some of these do not come cheap if you are looking at some of the top manufacturing makes, but it should be an investment piece, so try not to skimp.

You should look for the camera bags that have

plenty of compartments and dividers. Many come with Velcro that can be attached in certain places to fit the size of your lens and camera body so that they fit snugly together and do not bounce around. If you are looking to upgrade some lenses, make sure there are a few compartments spare for some extra pieces of kit. Some baggy pockets and extra dividers can carry instruction manuals and spare memory cards.

Don't forget that comfort is also important. Most often, you will be carrying your kit around while you work or walking on long hikes if you are a keen landscape photographer, so having it comfortable is a must. Don't be afraid to go in and try one on before you commit to buying one. Some over-the-shoulder carry bags are comfortable for some, but others find they drag on one shoulder and cause back ache. Others prefer the traditional backpack style, where the weight is distributed evenly over both shoulders. Make sure if you get this style that it sits on the correct portion of your back to prevent backache.

Waterproofing is also a good idea for your camera bag. It is not intended to be fully submerged, but some unplanned showers or the odd downpour may be unavoidable. You do not want to worry about your kit getting water damaged, so waterproofing is a must. Most camera bags come with it now, but make sure that this is fully sealable, instead of just a flip-over lid where anything can get in.

Don't be afraid to shop around. If you find a bag on the high street that you like after seeing it in the flesh and trying it on but feel that the mark-up is very high and not in your price range, make a note of the brand and the bag names and style and shop around online. Most photographers who upgrade sell on their old undamaged kits. This way, you can often find nearly all kit and bags for half the price of high street retailers. Some may be just under a year old but hardly used.

2.2.3 Remote Triggers

If you are looking to use an off-camera flash, you may be looking at investing in some remote triggers for your flash. These can be relatively cheap and, depending on how many flashes you have, you will typically need a transmitter and a receiver. This is one to send the signal and one to receive it, with one fitting to the top of your camera on the hotshoe and the others to the bottom of your off-camera flash. Again, look to shop online for these. Brands from Japan and China tend to have lower cost but very good reputations with professional photographers.

2.2.4 Memory Cards

The types of memory cards are covered in Unit 2, so we won't go over these in detail in terms of specific cards that you will need. Generally speaking, it is advised that you have around 2 or 3 with you. This way, you can have extra if you are take more images then intended or if a memory card suddenly becomes damaged or corrupt. It is always better to be prepared than caught short. These are relatively inexpensive compared to other parts of the kit, so it is always handy to have more if you need them.

2.2.5 Reflectors

These are also covered in Unit 2. Again, it is always good to invest in one. These are relatively cheap if found online, and you can fold them away and tuck them in a compartment within your camera bag.

2.2.6 Cameras

The normal digital cameras range from the high-end point-and-shoot to the large-format SLR camera used by the professionals.

The point-and-shoot ranges are usually aimed at the amateur
market, with people only wanting these cameras for basic family and holiday shots. These cameras cannot hold the capacity or technical ability to produce high-end images and will easily become obsolete if you are looking to take digital photography more seriously. Lenses cannot typically be fitted onto these, and you are 'stuck' with the lens that comes with the point-and-shoot and its limitations.

At the top end of the point-and-shoot, there is a new breed of digital cameras which is still aimed at the amateur market, but which has the option of some interchangeable lenses. These are normally compact, portable, and easy to use without having to have excess baggage.

The digital SLR is the more complex choice, where you will have a semi-professional or professional camera body. These are aimed at individuals who take their images more seriously or who are looking to make money from their images. The main market is dominated by two leading manufacturers: Nikon and Canon. Each offer exceptional quality in both cameras and lenses. With only slight differences, this will usually come down to personal preference. If you start speaking with professional photographers, they are often fiercely loyal to one brand or the other.

If you are looking to have a professional camera body, they will normally have two shutter release-buttons – one on the top and one on the other side – to ensure comfortable holding for long hours and to make landscape and portrait images easy to photograph. If you are looking to go down this route, you will usually have one main camera body and a mid-range back-up camera in case anything goes wrong on a shoot so that you do not have to pack up and go home. This would be especially unfortunate at weddings, so this would be an essential piece of kit to have it you were seriously looking into this avenue.

2.2.7 Lenses

Before you look to go out and buy a whole range of different lenses, make sure you look into your needs and fit the right lenses for your purpose. Lenses are the extension of your camera body: your camera body will do part of the work, while your lenses do the other half in producing a good image.

The best motto with lenses is that you get what you pay for. If you are looking for a cheap lens because you are on a budget, be aware that you will probably only use it a small number of times before the flaws become apparent. The quality of your work will show through after a few attempts and comparisons with other images that have been taken with better lenses, particularly if you are working with other photographers.

If you have decided on a manufacturer for your camera body, such as Nikon or Canon, look to stick to these brands or a Sigma lens. This way, you can guarantee the quality and be sure that you can claim on the warranty if anything were to happen. If you are thinking about getting lenses online, make sure it is with a reputable retailer and that you know you can return it if there are any problems. The last thing you want is to be spending over £400 for a lens that does not work and have no way of getting a refund.

You will normally have a standard lens in your kit that will cover a good range of things; most photographers may say that this is the 24-70mm lens. This is a lens that photographers may say is the lens that stays fitted to their cameras the most.

You will want to start off with some basic lenses to cover specific areas. From here, you can choose the best one to fit your needs. For example, if you are not interested in photography close-up macro shots, you will not need a macro lens.

24-70mm

This lens is a good mid-way lens and can be used for a variety of shots, from the standard wedding shots to studio work and some simple landscapes. This lens has the benefit of multiple focal lengths, which in theory has three lenses in one. This is why it is a popular starting choice.

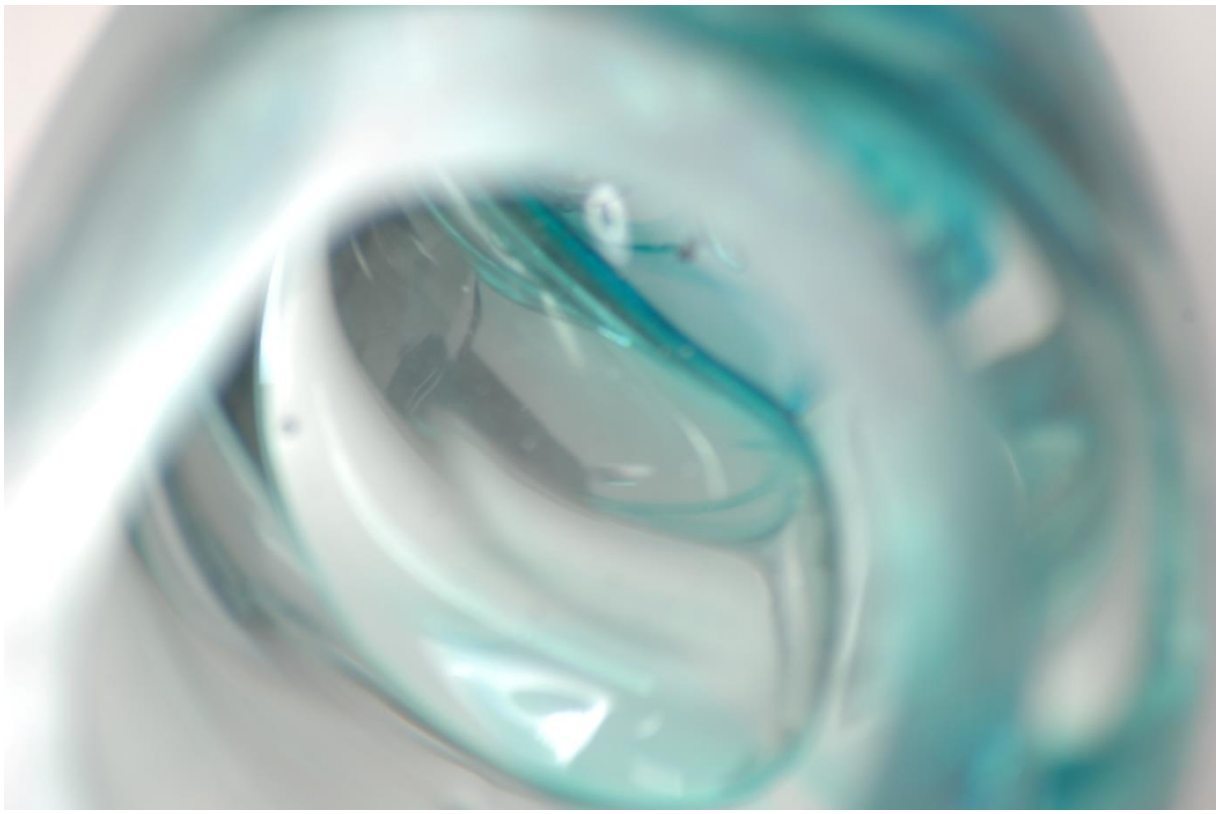
50mm

Photographers tend to love their little 50mm. This compact, petite lens is the 50mm f/1.8 prime. These lenses are good as they are relatively inexpensive depending on what brand you get. This lens is a great portrait lens, as it has an aperture of 1.8, meaning that it has an extremely shallow depth of field when you photograph with the lens wide open. With the majority of prime lenses, you will get lovely quality on your images.

70-200mm

This is a good starting point on the telephoto lenses. If you are looking, however, for a greater distance, then this one is classed as the baby of the telephoto series and may be too short for photographers who want larger magnification.

With the 70-200, you can have the option of putting the setting on a simple macro switch. Granted this is not a great detail, but if you are interested in experimenting with macro before you become serious about it, this lens can allow you to have a dabble.



© EJL

These close-up detail shots were shot with a 70-200mm sigma lens on the macro setting. These are not too bad for some starter shots.

Fisheye

The fisheye lens is one of these lenses which looks very appealing to start, but you will soon get bored of the effect, which can be overused in images. As these can be fairly expensive, you will need to look to see if you can justify the purchase with how much use you will get out of the lens.

3.0 Using zoom

Deciding whether or not to get a zoom lens can be a deciding factor in picking out a lens. Some of the zoom lenses are fast and will allow you to shoot at a wide aperture, such as f2.8. The more you go from wide angle to telephoto, the less optical quality you will be getting on the images. Drawbacks with the zoom will usually be based on a matter of opinion and preference, but some find that it can be heavy and cumbersome. Photographing with the zoom can be tricky: if you are looking to rely on the zoom to take close-up pictures, it can make the image unstable and some blur can occur. If you are fully relying on the zoom, you may need to look at you technique more.

3.1 space of studio

One of the questions that may arise when you start completing this course is whether or not you need a studio space. The answer is no: it is not a compulsory aspect of completing this course.

However, at least trying out the space at some point will be beneficial and allow you to fully understand some sections.

If you are looking at acquiring a studio space, these are usually fairly accessible in towns. Studio space is either rented out by the hour, half day, full day, or monthly. Some studios also have contracts where you can have a reduced rate per month with a key to the premises. If you are looking to pay per month, you can expect to pay over £200 depending on the size and equipment in the space. If you are renting per hour, this is usually between £15-20 with full use of the lights, backdrops, and accessories. The good thing about renting studio space is that you do not have to worry about the insurance, upkeep, or (more importantly) the bulbs, which can be expensive. You are able to come and go when you like, only booking it out when you need it.
This can also be a good way for you to decide if building or renting permanently is for you. Some photographers like studio space over any other type of photography, as they are fully in control. Other photographers like the flexibility and unpredictability of location work. This will be down to personal preference.
If you are looking at trying out a studio space, the best thing to do will be to look online or in the Yellow Pages. Most photographers or companies that have studio space for hire will be listed under photographic services or studio space and are very easy to find. Try to look for any reviews from previous users so that you know what you will be getting. In addition, ask if it is possible to see the space in person before you commit to a session.

Once you have tried out a studio space, you will find that you will have a favourite studio locally, and this will be the one that you regularly use. This is good, as you will get used to the kit, the owner, and how you both work. Often, some photographers who work on a monthly rota have a studio share, where other photographers use it at the same time. In this case, there may be a shared calendar with each photographer, so you will be able to see when studio space is available.

4.0 Aperture

In this section, we will look at aperture. A camera's aperture is the circular opening in the lens that controls the amount of light reaching the sensor.

The aperture goes hand in hand with exposure compensation, depth of field, and ISO settings, which are also covered in Unit 2. We will be going through each of these in each subunit, so there will be some repetition to remind you about the areas covered. For each image to be of an adequate standard the settings need to be adjusted in the camera.
The easiest way to remember aperture is that the larger the number, the smaller the hole and the smaller the number, the larger the hole. Therefore, when the aperture number is smaller, there is more light being let into the camera and hitting the sensor.

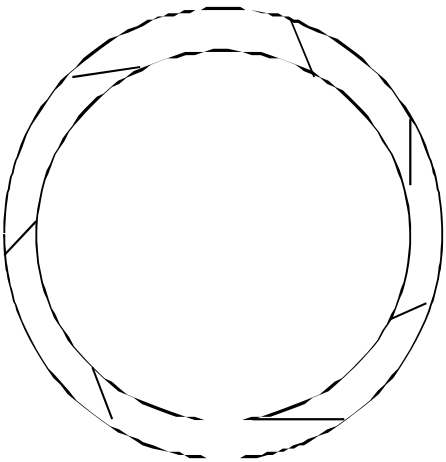
4.1 Aperture-Priority Auto

Most digital cameras will have the aperture-priority auto mode, where you will be able to choose the aperture while the camera automatically selects the shutter speed that will produce the optimal exposure.

4.2 Aperture - Manual Settings

Once you have completed this course, you will want to look at going onto an advanced course or look to investigate into manual settings. This will allow you to control both the shutter speed and aperture settings separately. This is more advanced and will require a greater understanding of your camera settings and focusing. Most new photographers will work on aperture-priority mode, where the camera works on the best settings.

Here we show some simple aperture settings:



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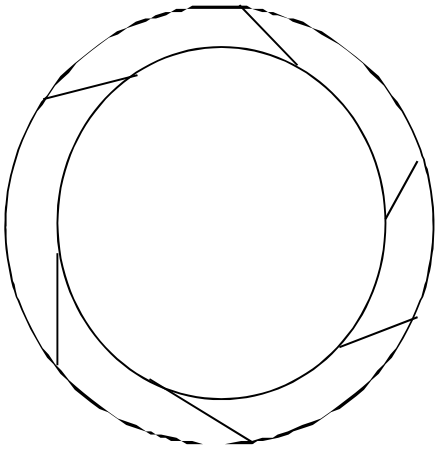

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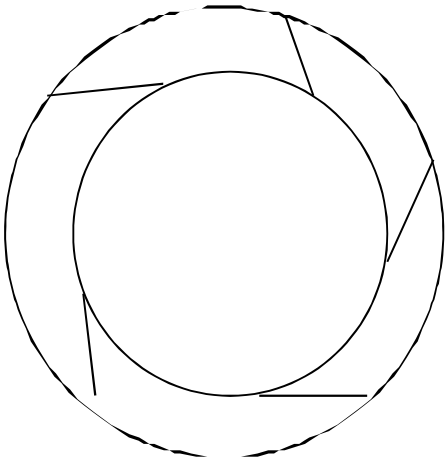

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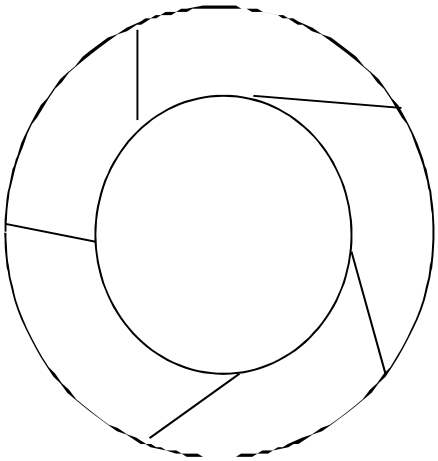
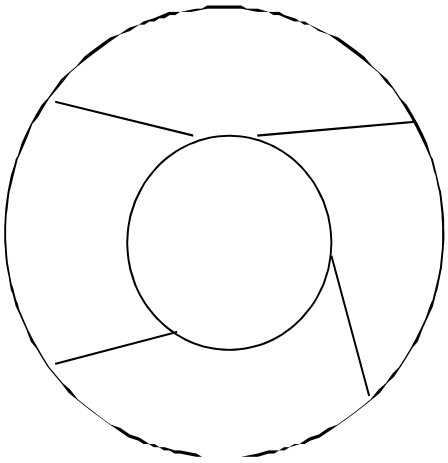
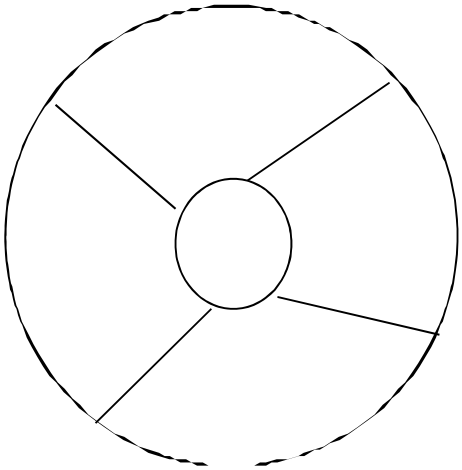


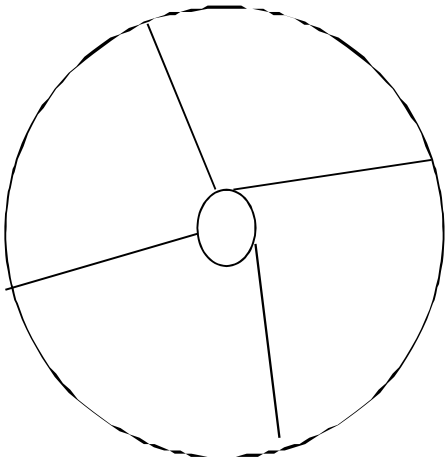
F5.6



F8



F11



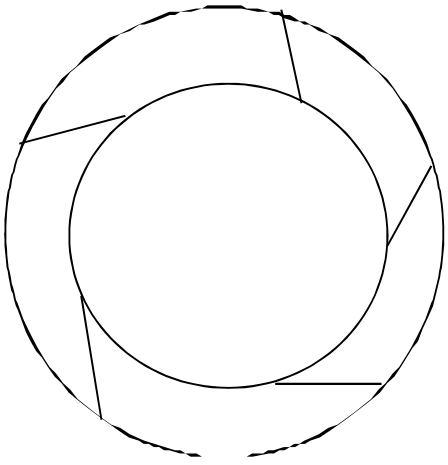
F16

As we can see from these examples, the curricular area varies depending on the setting that you have the aperture set to.

The way you set your aperture will depend on your camera. Some will want the aperture to be set on the lens itself; others will prefer it to be controlled by buttons or dials on the camera body. The aperture amount will depend on your lens, as some lenses will not go any lower than a 5.6, while others go down to a 1.8. This will come into play when you decide what sort of images you will be shooting: if you are photographing weddings in low-lighted churches, you want your aperture to be able to go down quite low to let as much light in as possible, as well as adjusting your ISO and exposure compensation.

Here we have experimented with the apertures of a camera. Each time, the ISO was set to a low 100, so you can see more of the changes to the images. These were shot on an overcast day, with changing winds and no exposure compensation added. The lens used was a 18-70mm and no Photoshop was used.

Here the aperture was set to 4.5. We can see that the flower is within focus and that as it is set to 4.5, as there is quite a bit of light going through to the sensor. Let's look back over to our diagrams again:

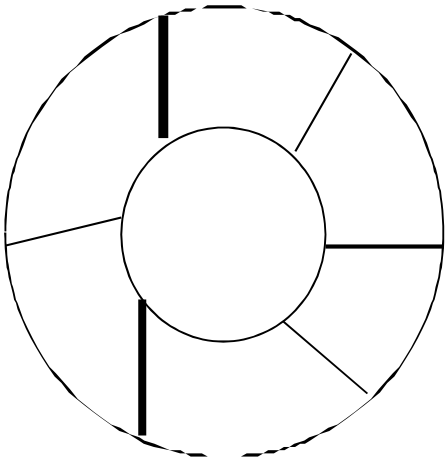


So we can see that there is a nice amount of light going in to compensate for the overcast day. If this were then edited in Photoshop, we could increase the contrast and colours if needed.

Here our aperture is set to 5. No change can really be noticed between the 4.5 and 5 aperture settings.

Next, we have increased to 5.6 aperture. Here we can see that the flower is still in focus, but the overall image is slightly darker, as there is less light going into the sensor.

Here the image is set to an aperture of 8. This is the point where the image quality starts to go downhill. We can see that this has started to blur and become out of focus with the overcast day and slight winds.
If we look at the diagram for f8 again:



We can see that the hole is noticeably smaller for the light to hit the sensor, so with no added f/Stops of ISO increase, the camera cannot light or fully focus on the intended subject.

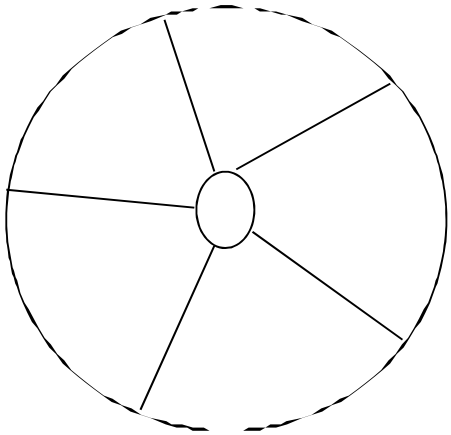
Here our setting is set to an aperture of f9. It appears slightly lighter with a break in the clouds, so the overall light in the image looks brighter, but as the aperture has been increased to f9, the hole is again smaller, resulting in a blurred image of our subject.

Here our image is set with an aperture of f11. We can see that the image has become darker and more blurred on the centre point and more around the edges of the focus.
Here our aperture is set to f13. Again, there is some dramatic differences in the amount of

blurring: we can see that the camera is not able to focus with this small amount of light.

We can then take this further with these high aperture settings:

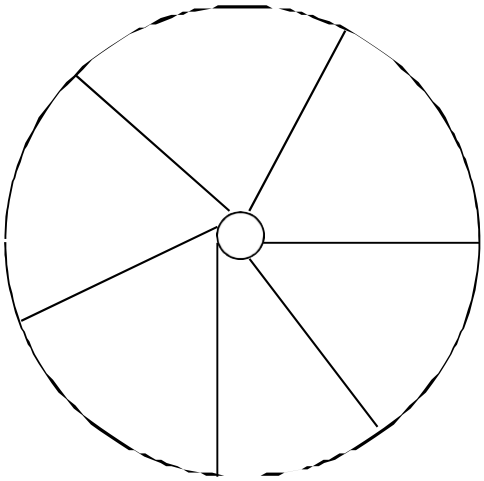
F16



As we can see looking back to our diagram, the f16 is a very low amount of light hitting the sensor, so our image is quite blurred.

F20

We set our final aperture for demonstration purposes of f22. As you can see, the image is very blurred and out of focus, the lighting is dark, and this image could not really be used for anything.



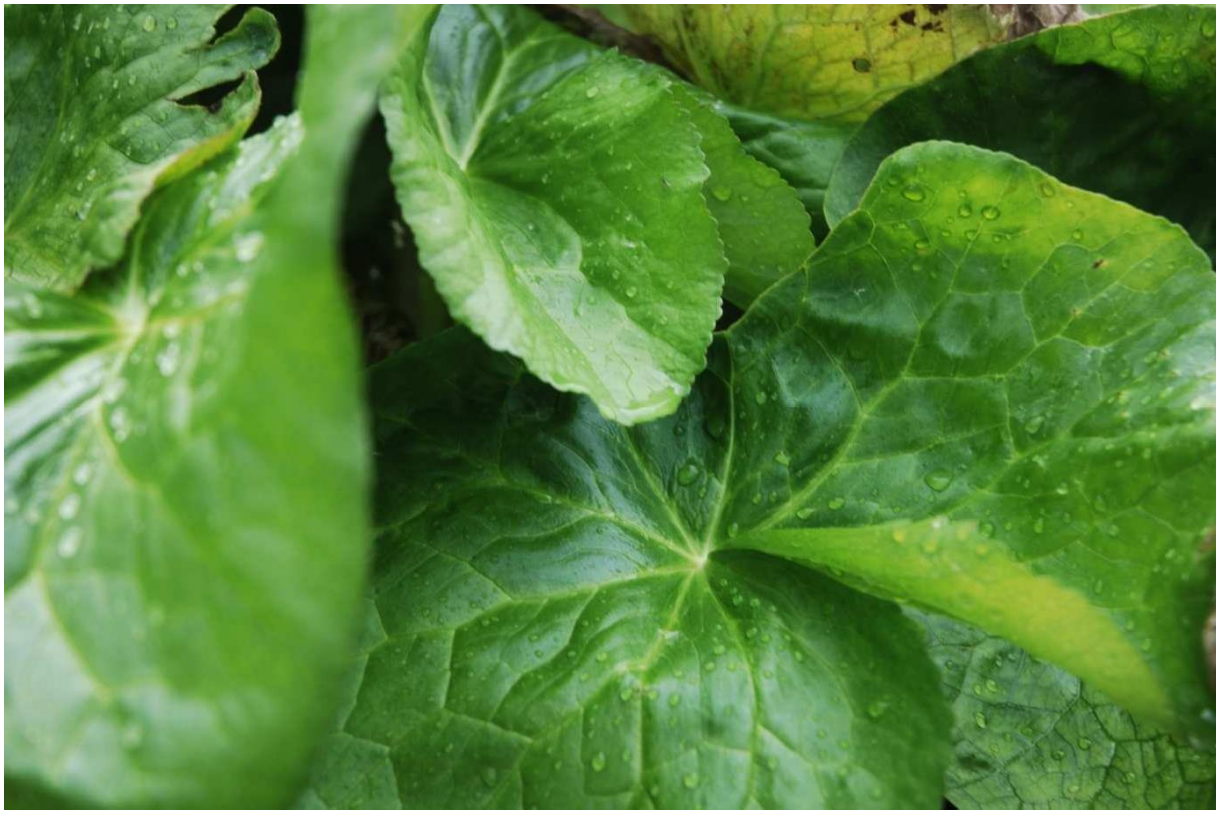
The diagram shows that the amount of light that can come through to the sensor is very, very small. Even a higher ISO and added exposure compensation would not be good at this high an aperture.

5.0 Exposure Compensation

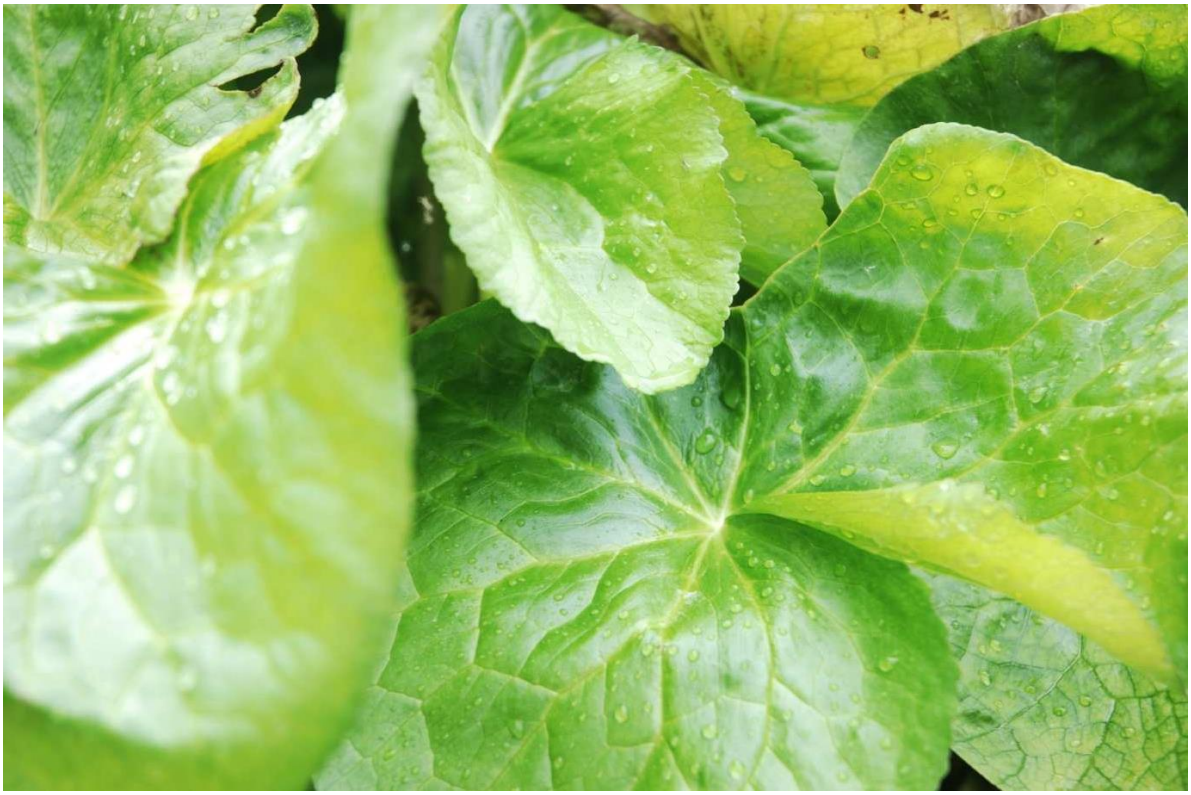
Exposure compensation is where you will alter the exposure from the values suggested by the camera for your shot. These work well when adjusting the aperture, ISO, and exposure compensations together to create an ideal image in camera.

The values run from positive to negative (+/-). Most cameras will go up in third steps, some with a maximum of 5 or 7. For example, it may go from -1.0 to -1.3 to – 1.7and so on. Most photographers find this handy to use and add or take away exposure when they feel they need to.

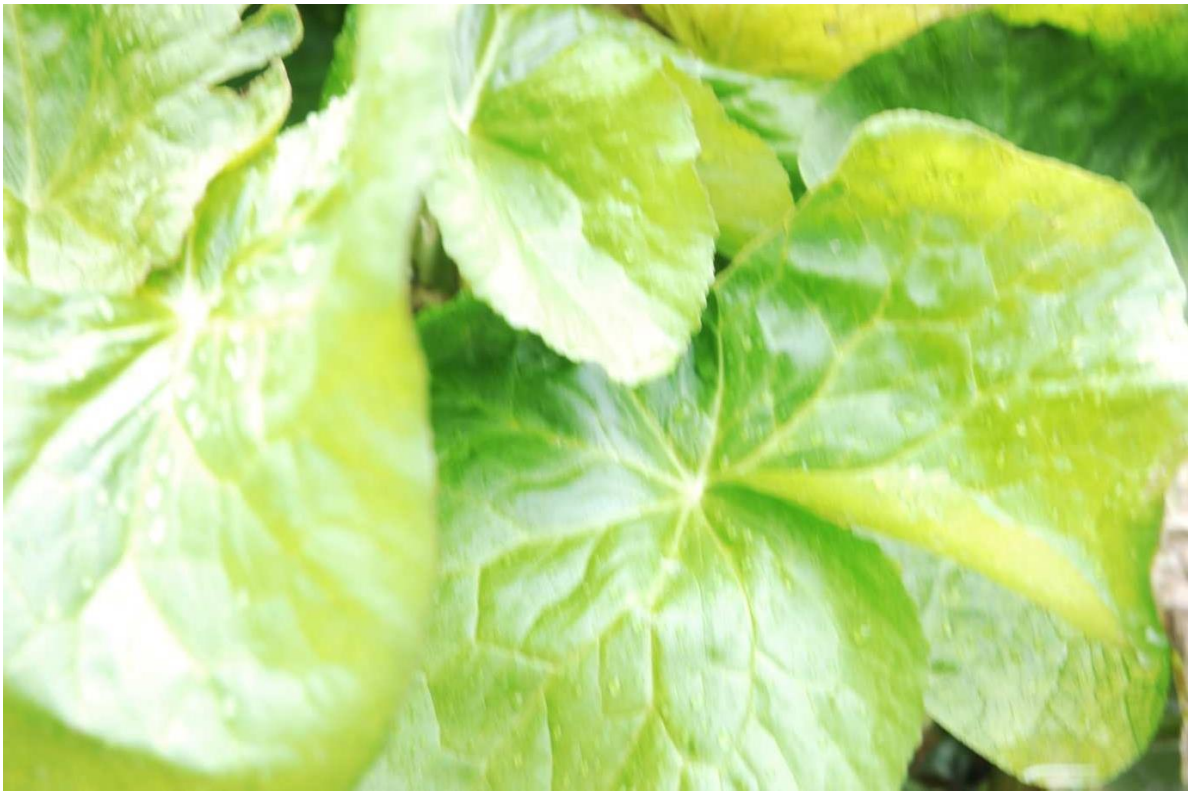
Here we look at some examples for adding extra exposure (overexposure in increments). Exposure value will be abbreviated to EV on the examples provided. Each image has been shot with an 18-70mm lens at an ISO of 100:



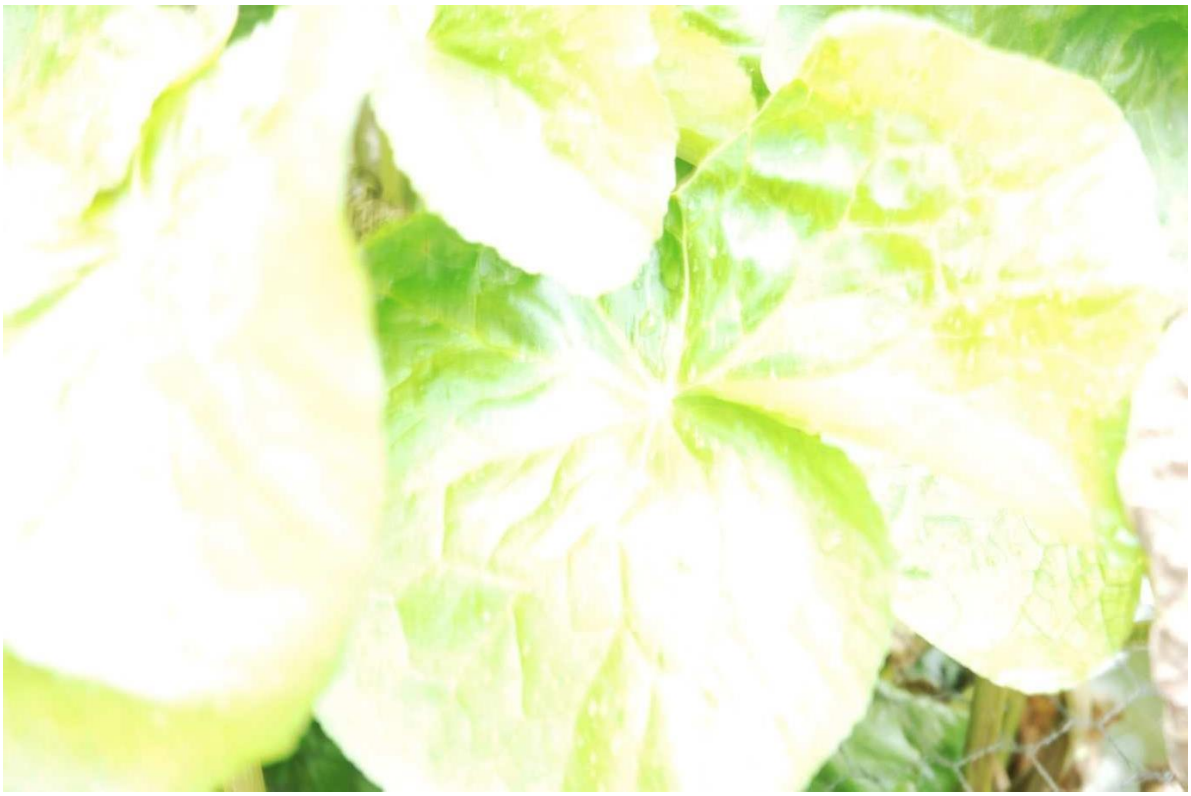
Here we have started with no added EV. As we can see, this is fairly well lit, and if we wanted to, this image would be suitable for use.



Next we increase the EV to +1.0, as we can see this has already increased the exposure and can be very noticeable. As the chosen subject has been the green leaves, this shows up very well for exposure, as an increase will instantly add yellows tints and any decrease will bring back darker green shades.



Next we have increased the EV to +1.7. Again, we can see even more yellow tones, but instantly we can see that this image has started to be overexposed to the point that the camera is now having trouble finding a focusing point.



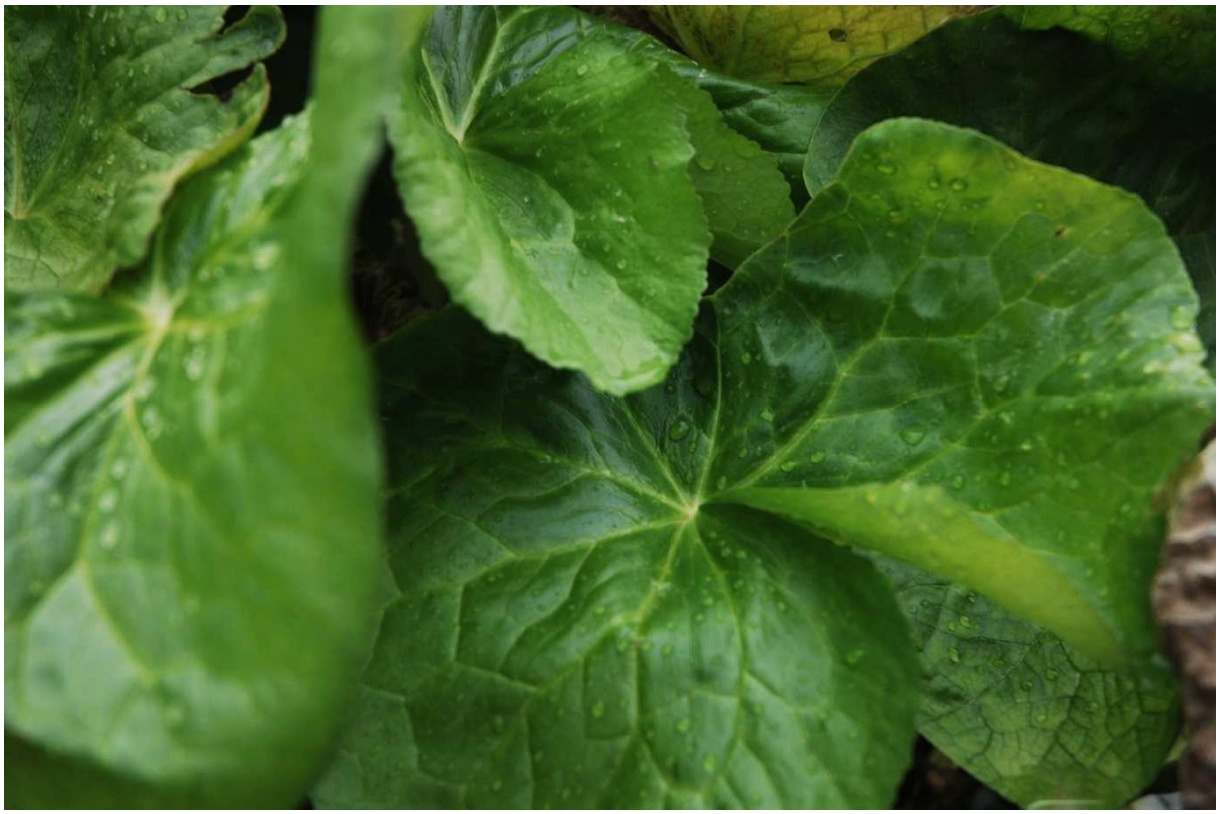
Here we have a very shocked version of our leaves. The EV have been increased to +3.0, making the image very overexposed, again with the camera having a very hard job finding something to focus on.

Finally, our camera has a maximum of + and – to 5, so this EV has been set to +5.0. A border has been added to this image to show the edges of the image itself, as it is just about blending with the white of the page. Here we can see that this is massively overexposed, and this is something that could arise if there is too much ISO added with too much EV. Ideally, you would not be producing images like this, but showing the +5.0 values does allow you to see how much exposure can be added to an image, so if you are struggling in low light conditions then this maybe a good option to add to your settings.

Now we can look at the negative exposure values. For the negative values, we will go up in slower increments, as the changes are more noticeable:

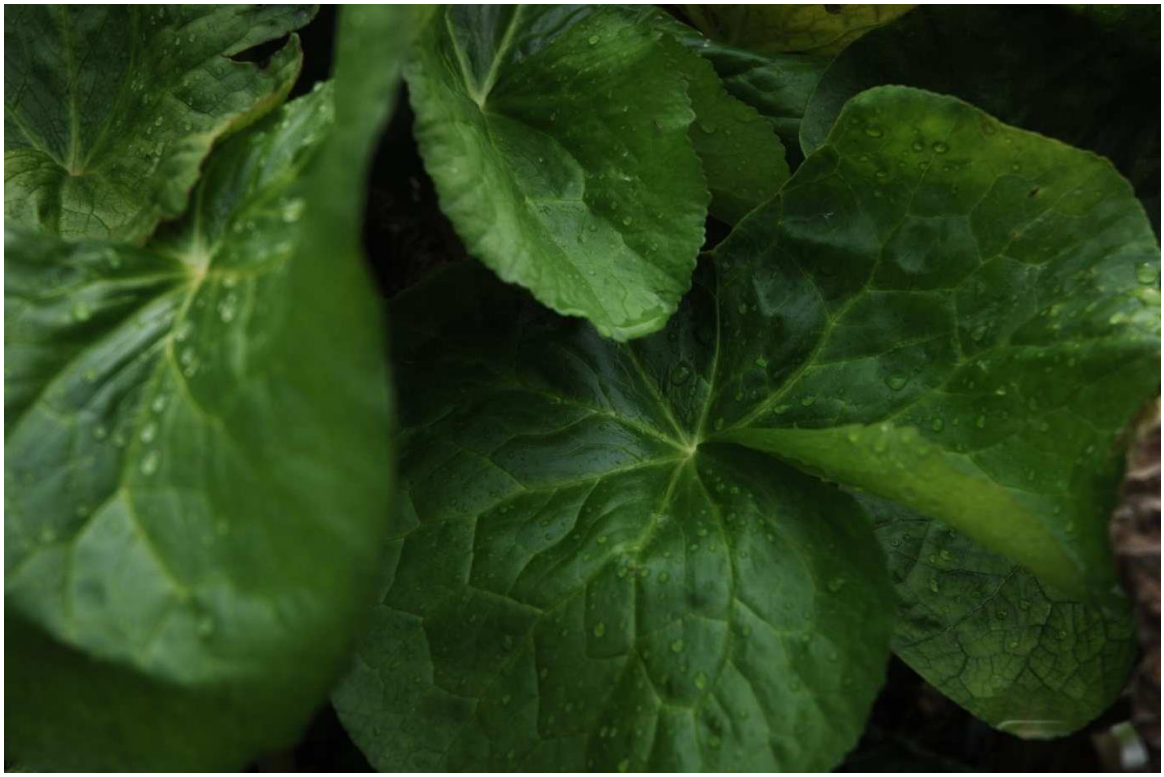
Again we have started from 0 EV as a starting point. We can see that this is a good image which can be used.

Here we have our EV set at -0.3. This is only a slight change, but it is still noticeable. This has set the greener tones as a bit more vibrant and stands out.

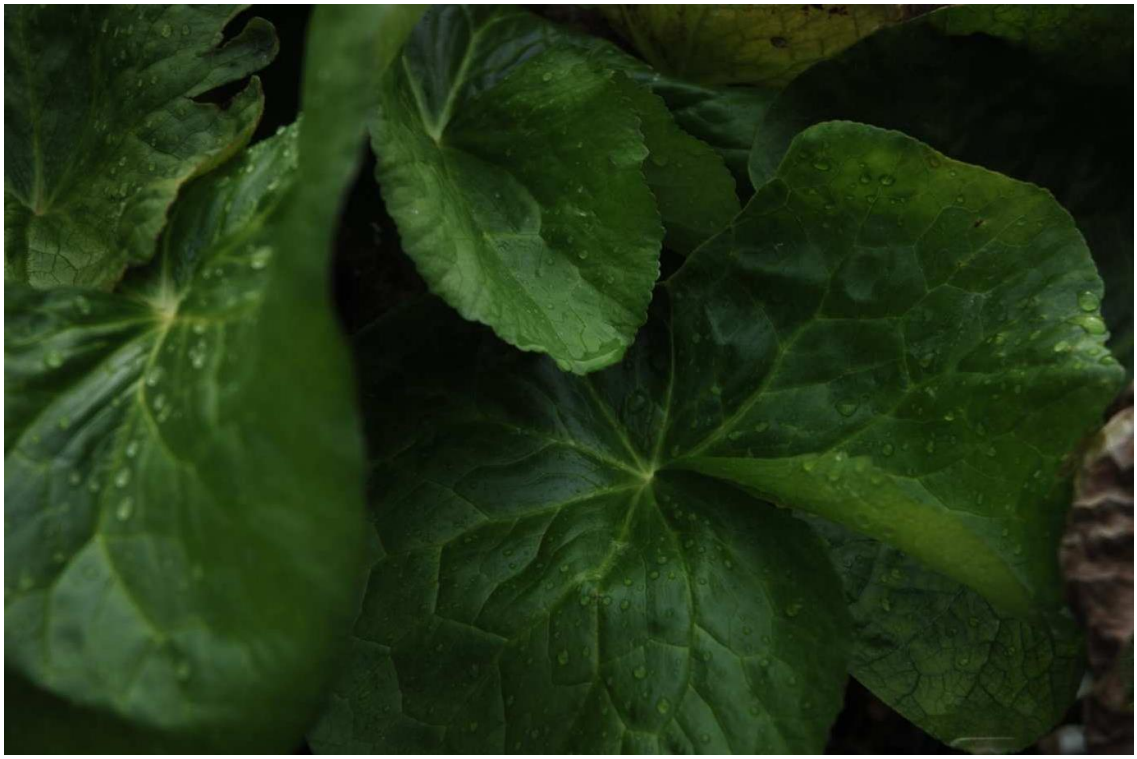


Next our increment goes up to -0.7 EV. Once more, this can be seen as more vibrant: the veins in the leaves are more prominent and the yellow tones are being lost.

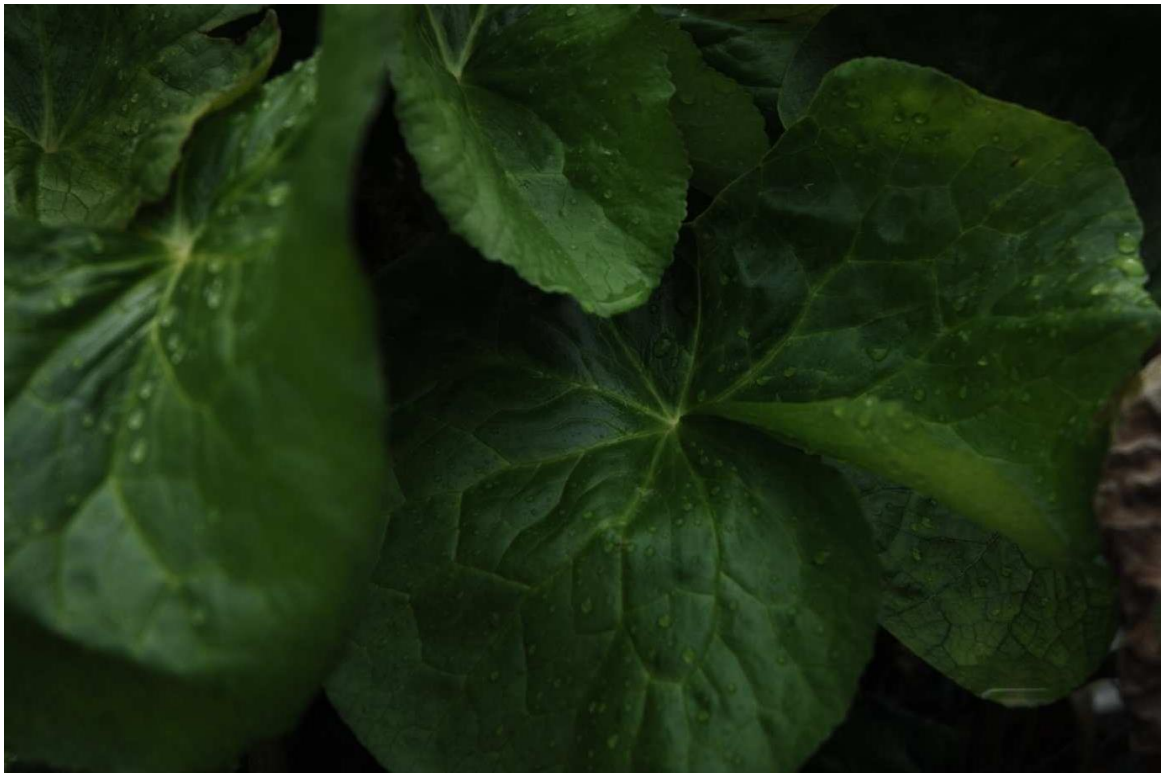
Next this increment has been set to -1.0. As this has gone down one stop, we can really see the tones taking shape, and the yellows are all but gone. For some, this may be bordering on too dark, and it is where most would stop. For the purpose of showing the increments, we will continue from -1.0.



Here we have our EV at -1.7. Personally, I like the dark rich colours, but this would be my final adjustment for the tones.



Our increment has now been set to -2.0. Here we can see that we have gone darker, losing some of the definition and tones of the colour.



Here our final value is set to -3.0. This is the darkest that would be able to be seen on this, and the next stage would be all but a black screen, especially if this was increased to 5.0 EV.

However, this shows the extent of the negative values and how underexposing an image can lead to some lovely tones in the images. Often, this can be used on portraits to bring out cheekbones or add a darker mood. Remember that images are all about evoking emotion in the viewer.

5.1 How to use exposure values in photograpy

When you start playing around with these settings of exposure values, you will start using these settings. Here are some examples of them in action:

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Here our pregnancy shot is all about emotion and the feelings that the image invokes. Often pregnancy will be a very emotional time for all involved, and it often passes slowly for the woman herself when she is pregnant. However, pregnancy can seem as though it has gone all too quickly when the baby is born, so as a photographer, it is about capturing those moments and freezing them in time.

The image shows the mother with her hands overlapping the father's. A low-lighting set-up was used in the studio with only one light directed away from the bump, casting a soft glow. The image was then taken at an angle to give the bump itself a slight depth of field near the belly button. A value of -0.3 was set to slightly bring back more shadows in the backs of the hands. Having the image then converted to black and white really brings out these settings. Pregnancy can be a good time to utilise these settings.

Below is an image from a pregnancy shoot where a blue ribbon was provided for a close-up; however, it was discovered shortly afterwards that they were having a girl, so they knew that they wanted the image converted to black and white so that you would not know that the ribbon was the wrong colour.

However, blue can show up with different tones in black and white images, so an EV of +0.7 was selected with a low-light set-up in the studio.

Once the image was placed into Photoshop, a conversion with black and white and a further removal of the blue tones allowed for this to be achieved.

6.0 Depth of Field

The depth of field can most easily be explained as the area of sharpness from near to far within a photograph. Most people will view this as what is being focused on and what is not, as one will be slightly blurred compared to the part that is not being focused on. In part, this is true, and it can be the preferred interpretation for some. However, it is also about the type of lens used and how you utilise the aperture that you are shooting at on your subject.

These are normally the influencing factors in creating depth of field:

The distance between the subject and the photographer
The aperture selection
The focal length of the lens.

Most photographers will say that the aperture that is selected will be the most important factor.

The theory is that the farther away things are from the in-focus subject, the more out of focus they will become. When using apertures at a lower value where the aperture is open to a larger hole, such as 2.8 or 5.6, only the light that falls on the subject is registered as sharp by the camera, and all excess light will be scattered across the sensor, being recorded as out of focus or blurred in frame. It is said that with a higher aperture, things will become more focused, and with a lower aperture, things will become more blurred in the background. However, as previously seen with aperture, this will depend on the quality of available lighting, so if you wish to use a higher aperture setting (such as f30), you will need to compensate with extra light and better ISO selection and balance these until you get your desired depth of field.

We will now look at some example depth of fields.

These were taken with an ISO of 100 and a lens 18-70mm with an aperture of 5.6:

Here we can see that the focal point has been the closest water lily. This has kept this subject sharp, with the depth of field blurring both the reeds and the oriental ornament. This produces quite a soft outcome, and most desire this sort of look.

Here we can see that the focal subject is the reeds. This has resulted in an odd, middle-ground sort of depth of field, as the closer water lilies become more out of focus compared to the oriental ornament.

Finally, on this example, we have the oriental ornament in our focus point. We have put an opposite end to our depth of field by having the background as the focal point.

Here is a contrast on the different focal points creating depth of fields:

Here our aperture has been set to f7, where our focus is on the garden feature. This example is looking at how close the photographer is to the subject. As the photographer is standing fairly close to the subject in question, this does not place the background in as much depth of field and is not quite as blurred.

Here we can easily see that the focus has been placed on the background trees, creating a blurred near image.

7.0 Type of the lense

As mentioned earlier, the lens type can also be a deciding factor. Here we try out different lenses to see the difference in the overall perspective in the depth of field.

These images were shot with a 50mm 1.8 lens. The ISO was kept at 100.

Here is our finished image. With this lens, we can see that the image seems well balanced and does not have as much blurring in the depth of field, even though the focus is still on the near lilies.

We can bring back the two for comparison:

Here is the original shot with the 18-70mm lens. compared to the 50mm lens:

We can see a very clear difference in the depth of field when we compare these. The 50mm seems to have placed everything in a nearer focus, with the depth of field not being as noticeable on the image.

We can also see the difference in a telephoto lens with the 70-300mm:

© EJL

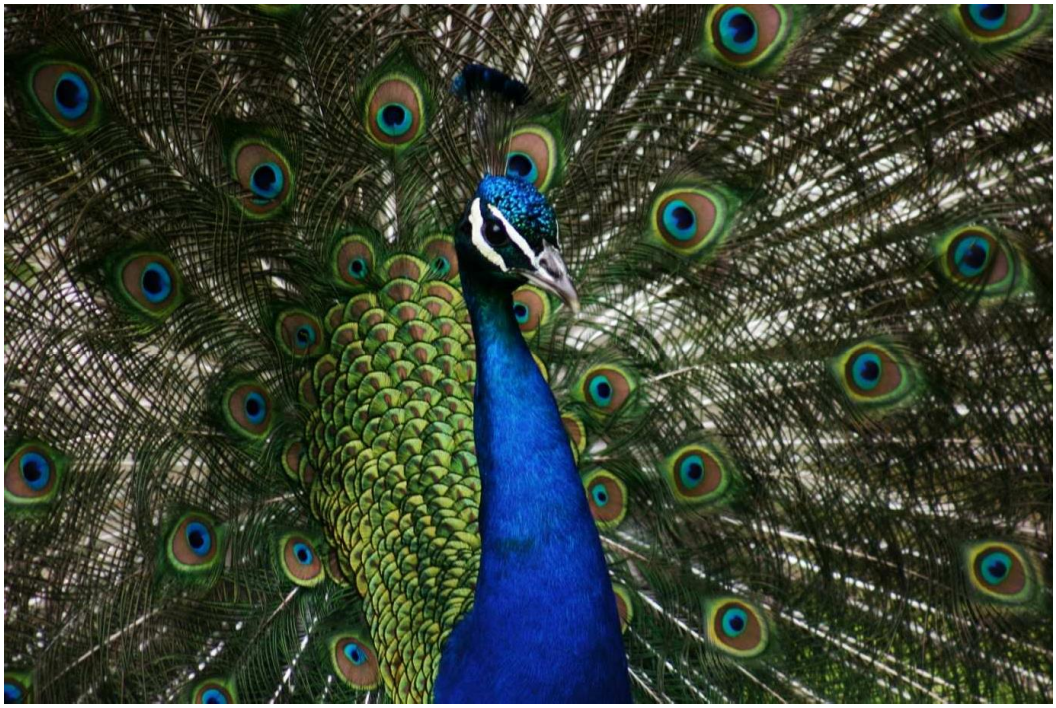
This can be more noticeable in the changes with the telephoto lens. The photographer has stood stationary in the same position used, but the telephoto lens will look to bring the image closer to focus on the lily and create its own depth of field. The depth of field appears to be more softly focus then the other two lenses. Photographers will tend to prefer the telephoto lens for the overall soft depth of field that it creates.

7.1 Use these values for a perfect click

When it comes to using depth of field in your photography, you will often not realise that you are doing it, unless you are fully approaching an image based on having something very out of focus in the background.

Here we have our pine, with the main pine in the middle in the sharpest focus. There has been a nice depth of field created with a 50mm prime lens with an f8 aperture.
This has allowed for the background to be unrecognisable and to also have the top pine slightly out of focus as well.

Here we will work on three images where depth of field has been added gradually. The overall look works on each image, so having the depth of field added will be a personal preference that you will come to decide as you start photographing more.



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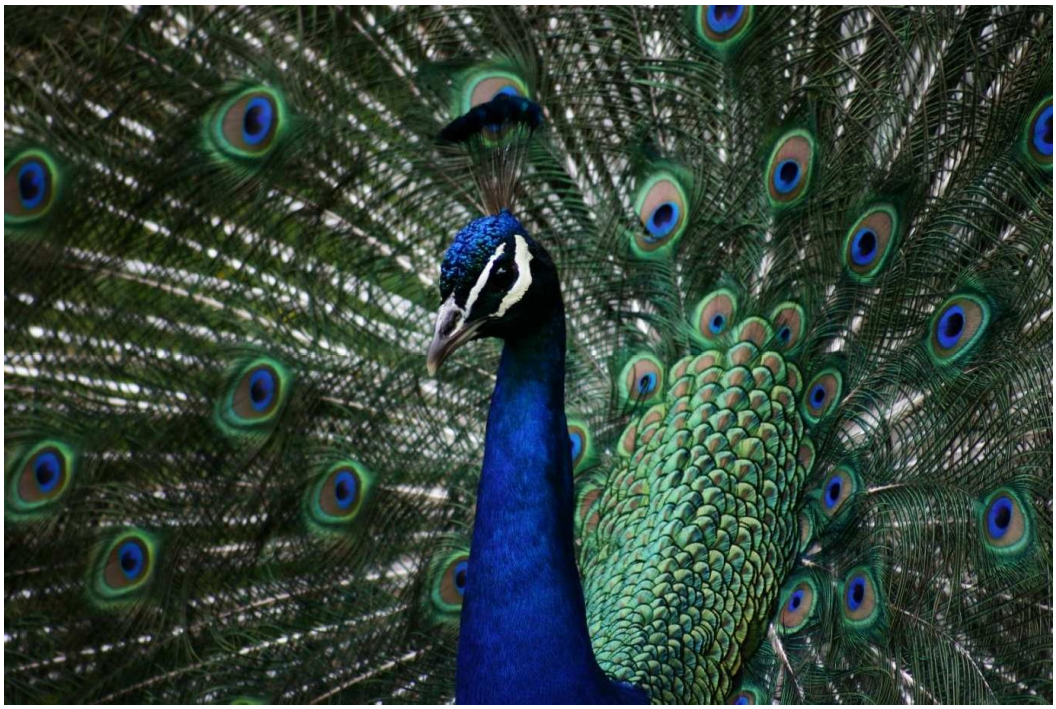
Here we have a front on shot of our peacock; the background is completely taken up with the feather display.



© EJL

Next, a slight side angle has been achieved with our peacock. With the lighting coming from the right, the feathers are given a blurred tone compared to the first

image. Also, a slight depth of field is only just noticeable in the far left-hand side of the frame as the feathers are disappearing form focus.

© EJL

Here, in our final shot, we have our final depth of field added. This was shot using a 24-70mm lens using f6. As it was a relatively sunny day, the aperture was set at a middle setting, allowing for some gentle blurring once the peacock had turned slightly.

Overall preference for some may be this composition with the added depth of field, as it gives a dynamic look to a beautiful creature. Others may prefer no depth of field, with a full view of the peacock so that it does not detract.

This will all be down to personal preference: once you start experimenting, you will decide if depth of field is something that just happens on your images or is something that you wish to use more artistically.

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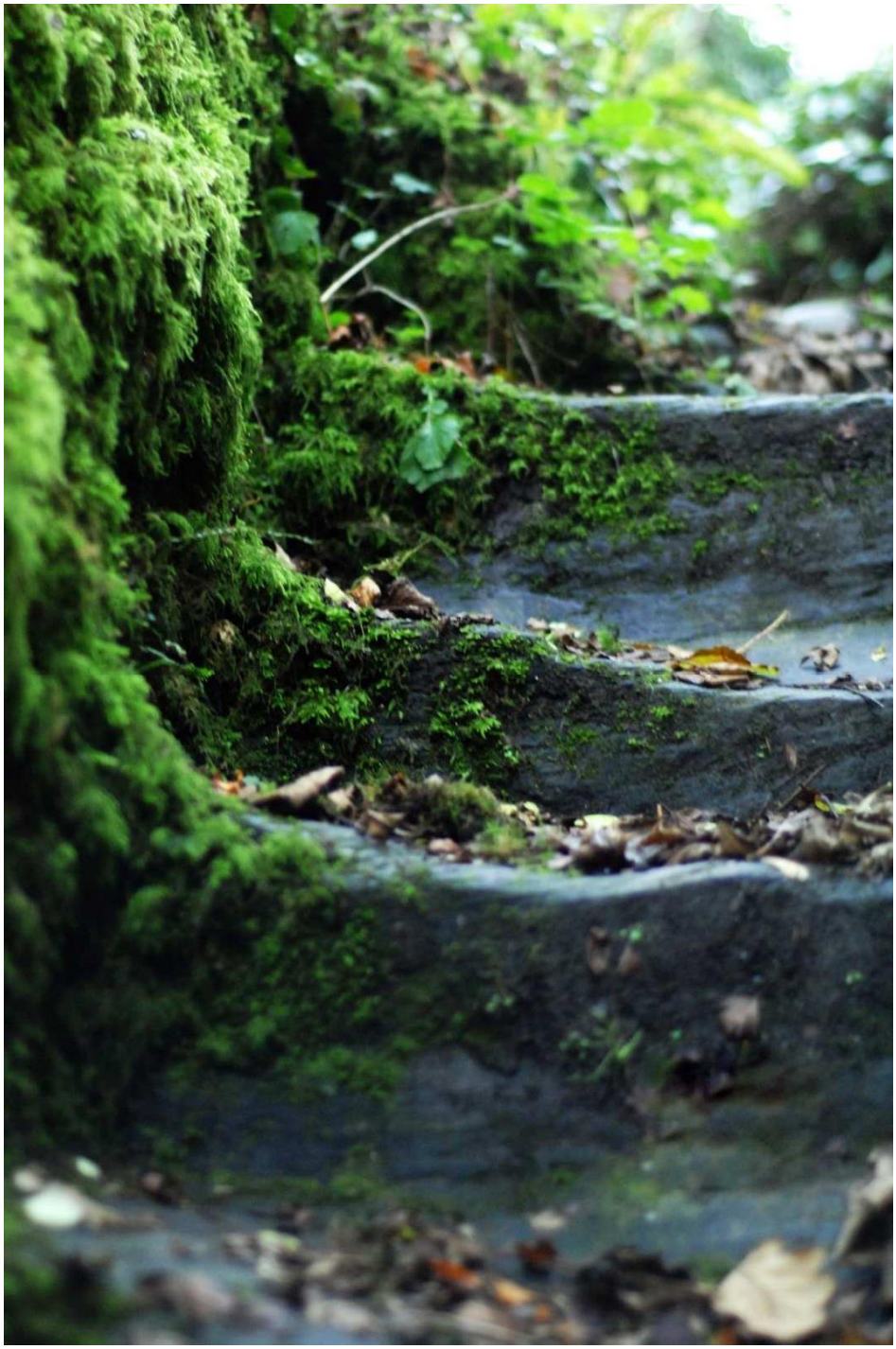
Here we have our soft grasses, with a focus on the grasses themselves. As we have cropped quite close into the image, the grasses are the main focus, so a depth of field is hard to see on a blue-sky background, as there is nothing to compare this to.

© EJL

However, once a focus has been added in with the rocks in the background, this gives the image some perspective. It also allows for a nice depth of field to be added with the rocks out of focus and the waters looking crystal-like and inviting. Depth of field often adds to the mood of an image, so this may be the main reason you choose to add it in.

Here we have another image of our late-afternoon shots. This image was taken further into the evening with a low-setting sun, allowing the thistle to be shot as a slight silhouette. The depth of field in this one is easier to spot, as the extra grasses and clouds in the sky are out of focus. This provides a rather dreamy effect.



© EJL

On this image, we only have a very slight depth of field when using a macro lens. This has been set at an aperture of f13 to allow for a less blurring depth of filed when focusing on the middle two steps, so that the nearest step is not quite as blurred.

Distance of field can also be used creatively with some close-up self-portraits. Here we can see that the background is blurred due to how close the subject is to the camera.