

Photography

Tutorial



the Beginner

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An in-depth guide to the elements that make up a photograph.

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[Composition](#)

The rule of thirds, the rule of odds, Leading lines, Frame within a frame, Selective focus, Diagonals and triangles, Repetition and patterns, Layers of depth, Using light, and many more.

What is the exposure triangle

Aperture, shutter speed, and ISO make up the three sides of the exposure triangle. They work together to produce a photo that is properly exposed.

If one variable changes, at least one of the others must also change to maintain the correct exposure.

Before we go too far, let's start our discussion by talking about a stop of light.

Understanding what a stop is is key to understanding the exposure triangle.

In photography, a stop refers to the doubling or halving of the amount of light that makes up an exposure.

Each photo that we take requires a certain quantity of light to expose it correctly.

Adding a stop of light by doubling the exposure will brighten an underexposed image.

Conversely, decreasing an exposure by one stop (halving the amount of light) will darken an overexposed image.

So how do you add or take away a stop of light? To do this, we need to change the aperture, shutter speed, and/or ISO. Let us look at each of these individually.

Shutter Speed

Shutter speed is the length of time light is allowed to hit the sensor.

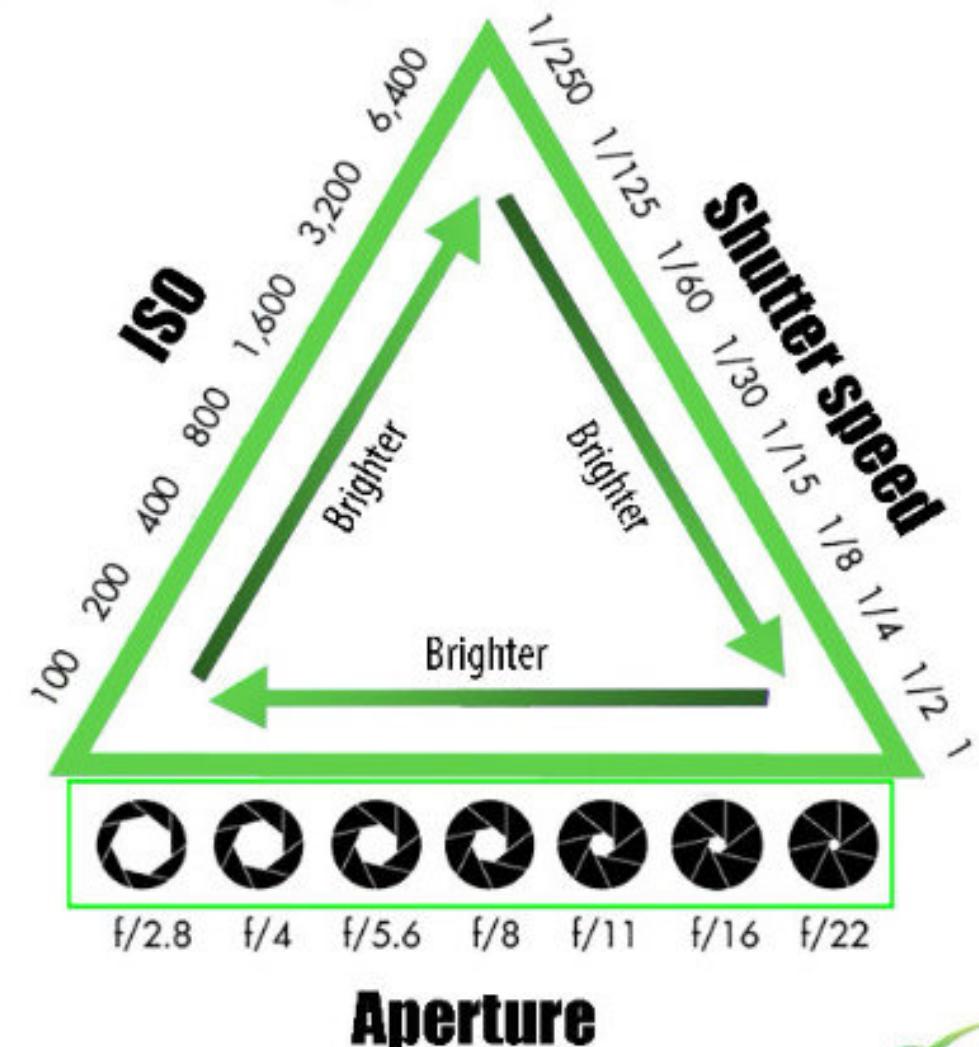
It is measured in seconds. Shutter speed is probably the easiest of the exposure triangle sides to understand.

To double the amount of light, we need to double the length of the exposure. For example, moving from a shutter speed of 1/60s to 1/30s will add a stop of light because the shutter will remain open twice as long.

Changing from a shutter speed of 1s to 1/8s will decrease the exposure by three stops.

Why? From 1s to 1/2s is one stop. Then 1/2s to 1/4s is another stop. Finally, 1/4s to 1/8s is a further halving of the time the shutter remains open or the third stop.

Exposure Triangle



Shutter speed in seconds

1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1
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Less light



More light

Subject movement frozen



Subject movement blurred

Aperture

Aperture refers to the size of the circular hole in the lens that lets in light.

The bigger the hole, the more light that reaches the sensor. In fact, each time you double the area of that opening, you double the amount of light or increase the exposure by one stop.

On the other hand, if you half the area of the opening, you half the amount of light hitting the sensor decreasing the exposure by one stop.

Now I could go into a lot of mathematical mumbo jumbo to explain the f/stop calculations, but I'm going to suffice to say the guy who thought this one up needs a good slapping.

Essentially, the size of the aperture is measured in f/stops, which varies the amount of light that hits the sensor.

The larger the aperture, the more light - the smaller the aperture the less light.

Paradoxically, the larger the number the smaller the aperture and vice versa as can be seen from the diagram opposite.

ISO

The final variable in the exposure triangle is ISO. You can think of ISO as the sensitivity of the digital sensor to light.

The lower the number, the least sensitive to light - the higher the number the more sensitive to light.

In practical terms choosing a higher the ISO is saying the camera needs less light from the other two elements, shutter speed and/or f/stop to get the correct exposure.

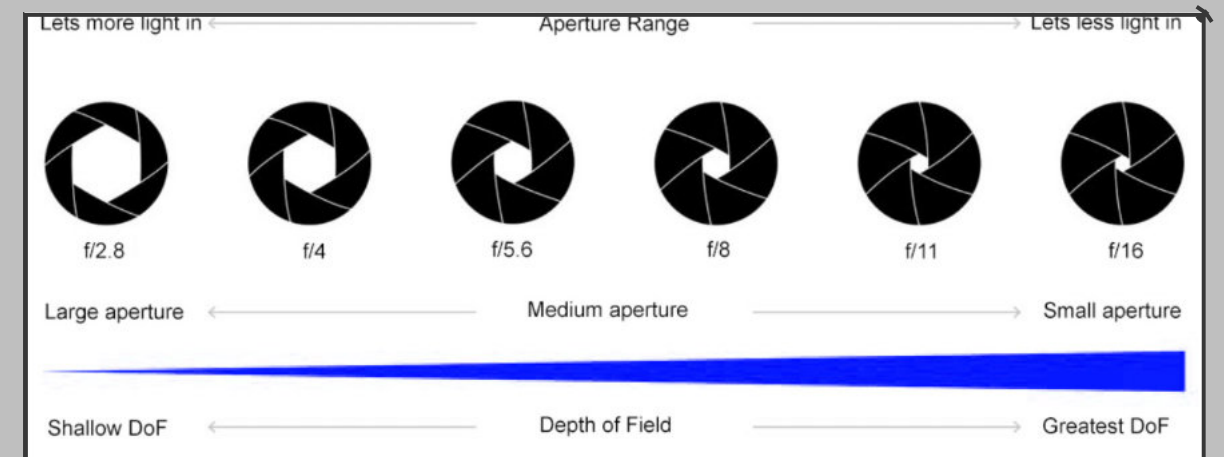
Note that each of the elements have a sting in their respective tails.

Fast shutter speed will capture movement - slow shutter speed won't.

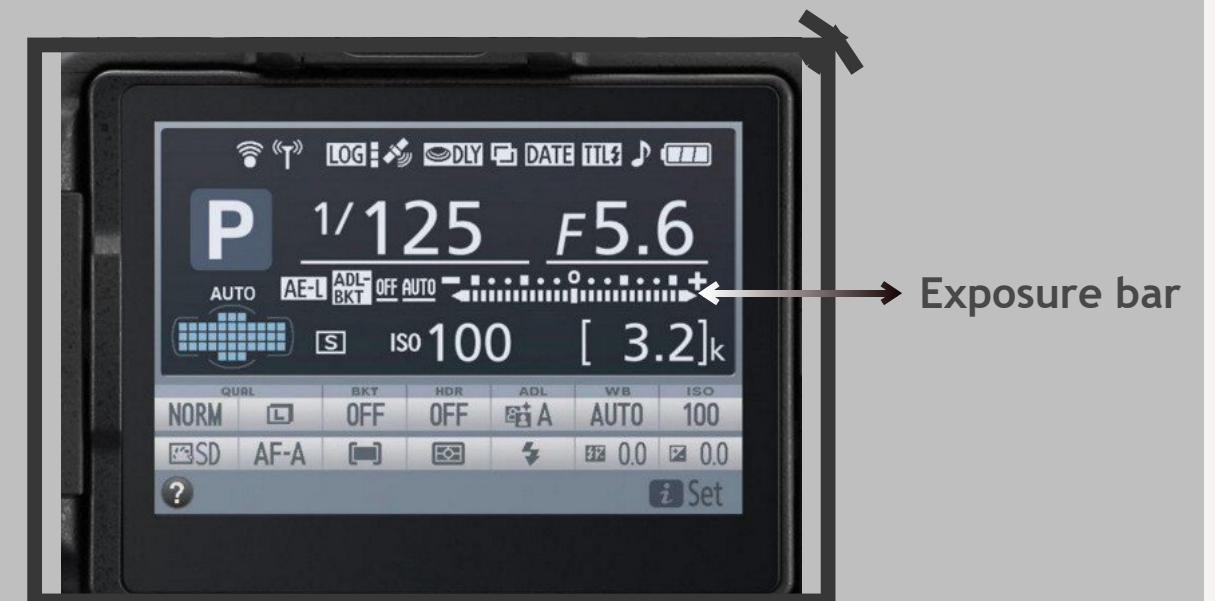
Large aperture will have a shallow DOF - small aperture will have a deep DOF.

Low ISO will have no noise - High ISO will be very noisy.

Aperture



Camera Viewfinder



If the indicator is on zero, then the exposure will be good. Left of zero will be under exposed, right of zero will be over exposed.

You can also regard the ISO as a sort of light multiplier.

ISO

100	200	400	800	1600	3200	6400	12800	25600
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Least sensitive to light

Most sensitive to light



Least noise

Most noise

Taking the photograph

When we look at a scene, we see it three dimensionally. This is because we are seeing the scene through two lenses and our brain is processing what we see and giving the scene depth. (Three dimensional).

When we take a photograph of that same scene, the photograph will be flat and uninteresting, because it is seen through just one lens. (Two dimensional).

Teaching my Grandmother to suck eggs? We'll see.

The scene opposite was a stunning vista, one you could look at for hours, yet as a photograph it is dull and uninteresting.

Yet this image is a lot more interesting to look at. It is still a two dimensional image that has a three dimensional feel about it.

The reason for this is the Gorse bushes are leading the eye from the edge of the frame into the centre of the scene;

is diminishing in size as it reaches the centre of the scene.

The first line of hills are occupying 2/3rds of the frame and overlapping the distant hills.

All these factors are lending to creating an optical illusion of three dimensional depth on a two dimensional surface.

There are many ways to create this illusion and we'll be looking at those later on.

Understanding Dimensions



Taking the photograph

It's already been said that photography is all about capturing light. While this is true when we consider the stops of light in the exposure triangle, there is also capturing light as it's happening.

In the first photo, it was a case of waiting until a shaft of light struck part of the scene, changing a very dull vista into a dynamic image.

It's always a good idea, when the lighting is changeable to wait a few moments before taking the shot.

This shot was taken with the ISO at 200, f/16 aperture using hyper-focal distancing. (more of that later).

The second image was taken in a hot house in Wisely Gardens. Again it was a case of waiting for the sun to strike the plant and taking the shot at the right time.

Somebody did point out to me that I could have got the same result if I'd shone a torch on the plant.

There's always somebody, isn't there.

Nevertheless, it's the lighting that is the making of these two images.

This shot was taken in low light with a wide aperture, to capture the fern with a shutter speed fast enough to underexpose the background

Capturing the light



Taking the photograph

This image is using the extremes of light and dark to create the illusion of depth.

The shadows of the windows start the illusion and the human eye continues it.

The subjects are placed in the right third of the frame and the negative space gives the image dynamism and drama.

Natural side lighting is always good for portrait photography.

Again, taken with a wide aperture and a fast shutter speed.

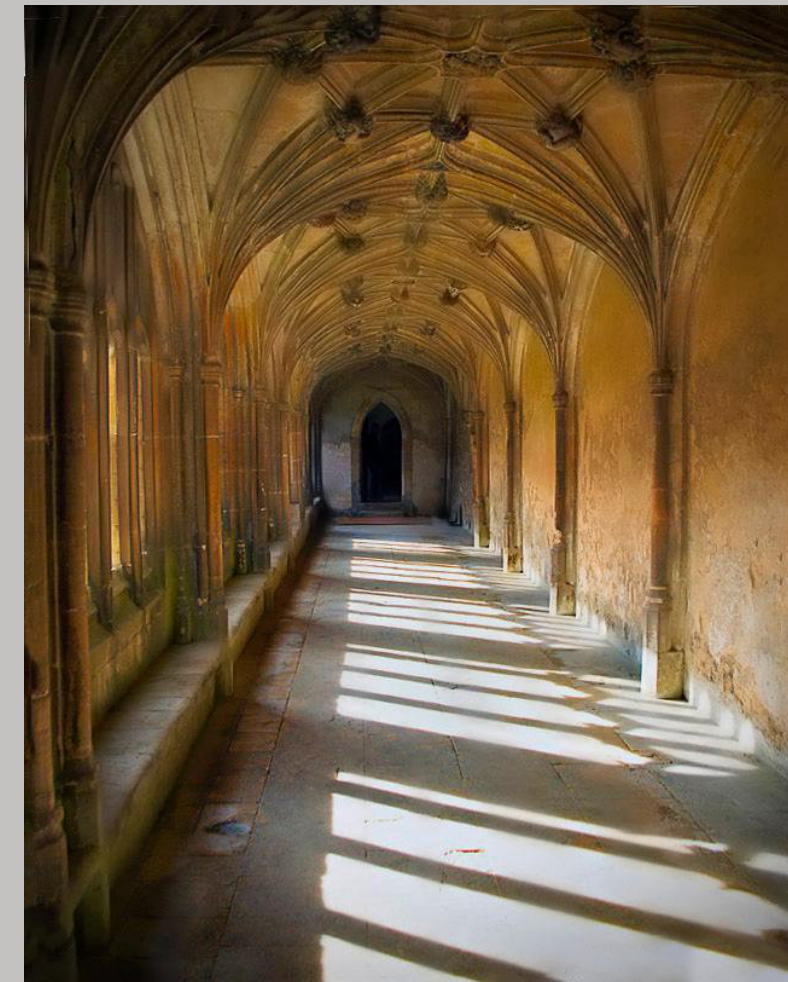
Combining illusion and light



The receding lead-in lines are the making of this image, accentuated by the strong sunlight.

This is still a two dimensional image - but my life, just look at the depth of field a small aperture gives.

F/11 aperture on Aperture priority.



Taking the photograph

If you are capturing macros in situ, that is as it happens in nature, there are two ways to go about it. With the camera hand held or the camera on a tripod.

This shot was taken with the camera stabilised and with a macro lens; the aperture was set to f/2.4 returning a very shallow depth of field.

In order to get the spider sharp through the entire length of the subject, I took several shots, focusing on different focal lengths of the subject's body and stitched them together in post processing.

This shot was hand held, using a 300mm zoom lens.

Aperture at f/5.6 with a shutter speed of 2000th of a second.

Capturing Macros



Taking the photograph

Look for the unusual - these are water droplets caught on a spider's web.

One step either left or right and the illusion would be lost.

A series of macros, focus stacked and stitched together as a panorama.

Spray some sugar water on blooms - the hover flies love it - they'll stop there for ages

This shot was hand held, using a 90mm fixed lens.

Aperture at f/5.6 with a shutter speed of 1/2000th of a second.

Capturing Macros



Taking the photograph

Taking shots like this is easier than you would imagine and I offer it as an incentive for the learner to try for themselves.

Set the camera on a tripod or steady surface and focus on the flower. Then wait for a bee to alight on the flower.

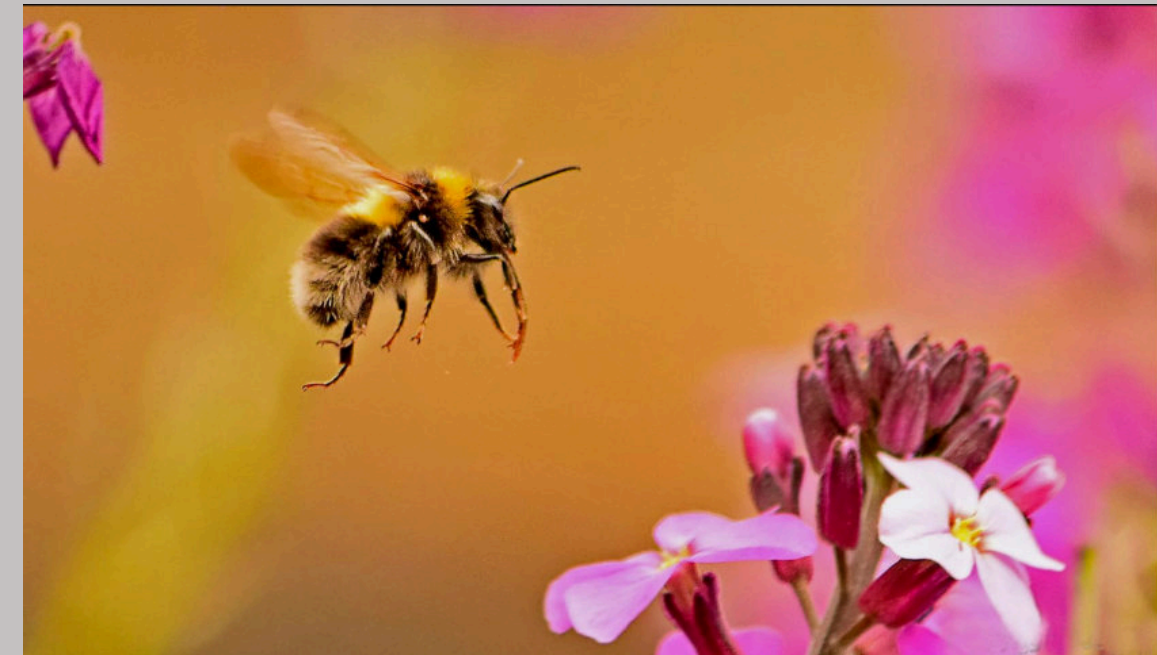
When the bee leaves the bloom she will fly backwards before moving onto the next bloom.

That is the time to ambush the little buggers.

Note the blurred background caused by a large aperture.

F/5.6, 1/1500th sec ISO 200

Capturing Macros



This isn't strictly a macro shot.

I offer it as an incentive to beginners to show what is possible with a bit of thought.

The subject is a midge. This little lady was, periodically, flitting up and down just in front of me. So I pre-focused just about where the midge was flying, reset the camera to automatic focus and set the audible beep.

When the midge returned, I half pressed the shutter and when I heard the beep, fired off a high speed burst of shots.

I had seven totally empty, under-exposed frames apart from one, which had a small spot of light.

A massive zoom in post processing and an adjustment for exposure produced the image you see.

Hand held, using a 300mm zoom lens.

Aperture at f/5.6 with a shutter speed of 4000th of a second.



Taking the photograph

While it's true we can photograph what we like in a public place, photographing people without their permission in a street photography scenario, can prove to be a hazardous experience.

People do not like to be photographed without their permission
Be aware of it!!

I always try to photograph scenes so the people are just figures in a landscape and non identifiable.

When asked, I always tell them I'm using them as props to add credence to the scene.

F/11, 1/250th sec ISO 360 for both images.

Also use people as a sense of scale.

Note the person, placed at one third of the frame, to give a sense of scale for the distant forest.

Note also, the red of the subjects jacket is a complementary colour for the green of the fir trees.

Not deliberate, I hasten to add - but I'll grasp a happy accident with both hands.

Street Photography.



Taking the photograph

We will soon be moving into the realms of the rules of composition, so I want to make a start with these two images.

Both shots were taken with a 600mm zoom lens, shot at f/6.3, (the widest possible for the lens), and 1/2500th sec.

Note the background in both images is very pleasantly blurred, making the pin sharp images really stand out, giving an almost 3-D effect.

We're back to another method of giving a two dimensional surface some depth.

Note, also, the placing of the subjects within the frame.

The subjects are placed within 1/3rd of the frame and both subjects are looking **into** the frame, not out.

By doing this you will be, on a subliminal level, getting the viewer to include the negative space as the natural habitat of the subject.

Try this the other way round and see how jarring and out of kilter the image will be.

Wildlife photography needs patience and a keen eye. Any turn of the head or body will give a dynamism to the photograph you won't get with a static stance.

Wildlife and nature



Composition

Rule of Thirds
Rule of Odds
Lead-in Lines
Frame within a frame.
Selective Focus of D.O.F.
Diagonals and Triangles
Repetition and Patterns
Negative space
Layers of depth.

Rule of Thirds

The image opposite is a typical example where the thirds grid is used to place a subject

An in-depth explanation on the page below.

Nine elements of composition



Composition

Rule of Thirds

Some basic rules.

Landscape photography: Never split a photograph in half with the horizon. Always place the horizon on the horizontal 1/3rd or 2/3rd line.

Portrait photography: Always place the nearest eye on one of the crosses, ensuring the subject is looking into the frame.

General photography: Use the vertical thirds to place the subject in the frame to create negative space, ensuring the subject is facing into the frame.

This is to make room for the subject to look, run leap, fly, or otherwise move **into the frame**.

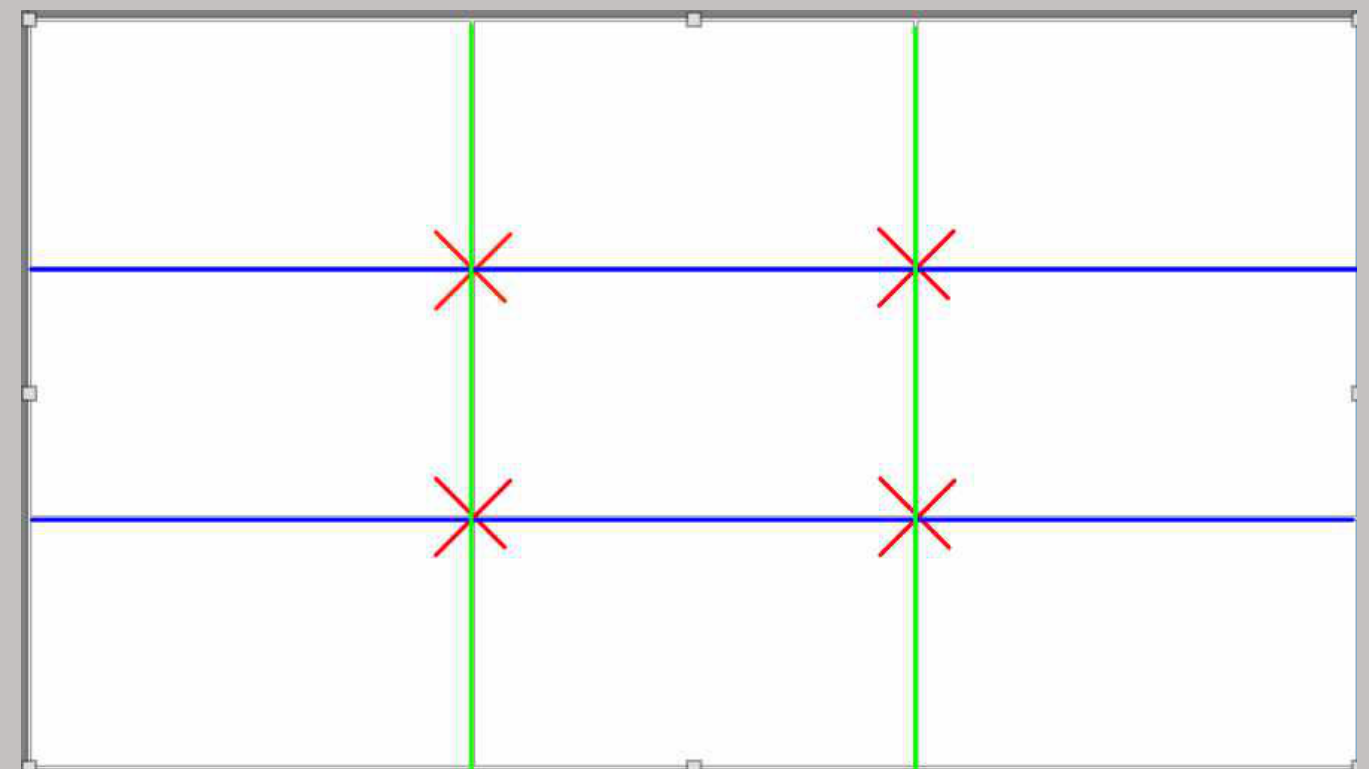
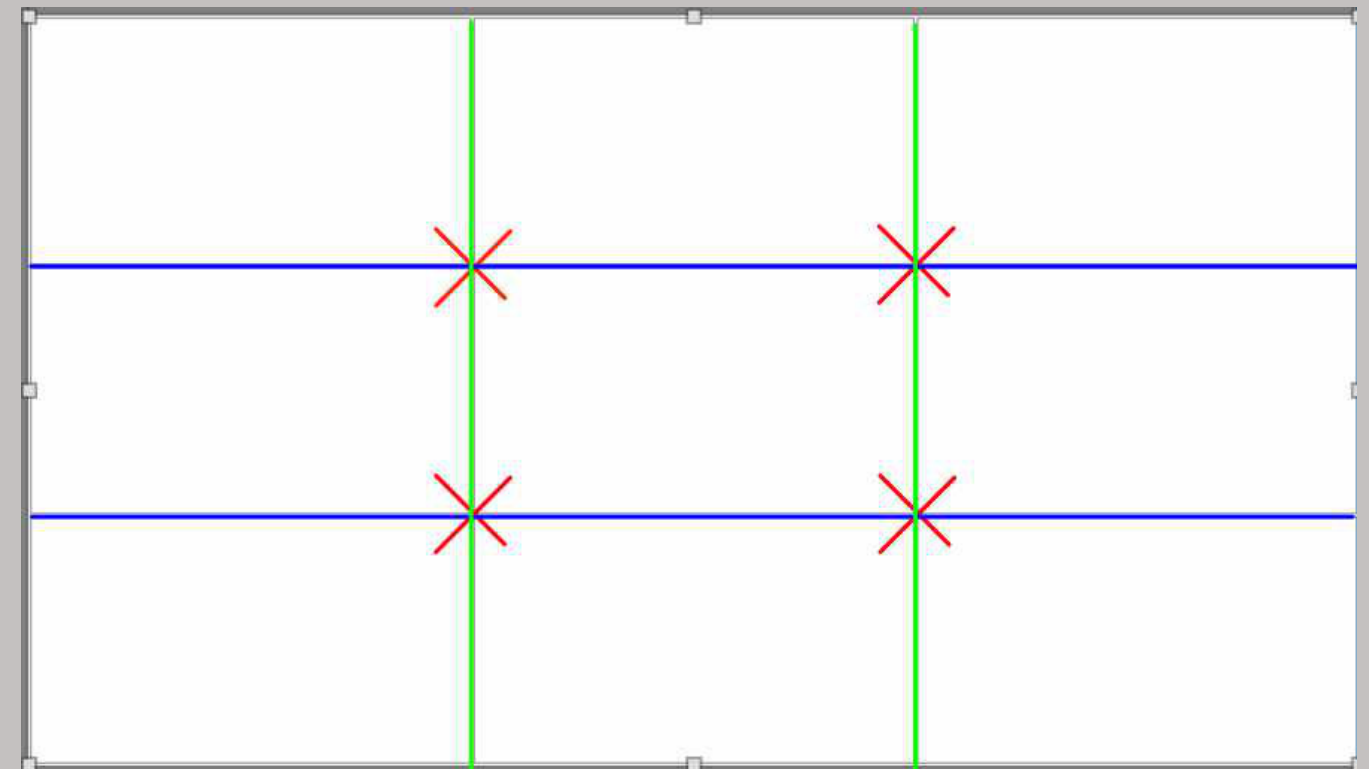
Also use lead-in lines to converge on the crosses/thirds lines.

This principle will always ensure there is a dynamism to action shots, such as sports, wildlife, candid street photography.

Patterns can be enhanced if the rule of thirds is followed.

Do not underestimate the power and versatility of the rule of thirds.

Nine elements of composition



Composition

Rule of Thirds

If you can imagine, when taking your shot, a grid dividing your viewfinder into thirds, try placing the subject either in one or two thirds of the frame.

Alternatively, place the subject in the middle of the frame and crop in post processing.

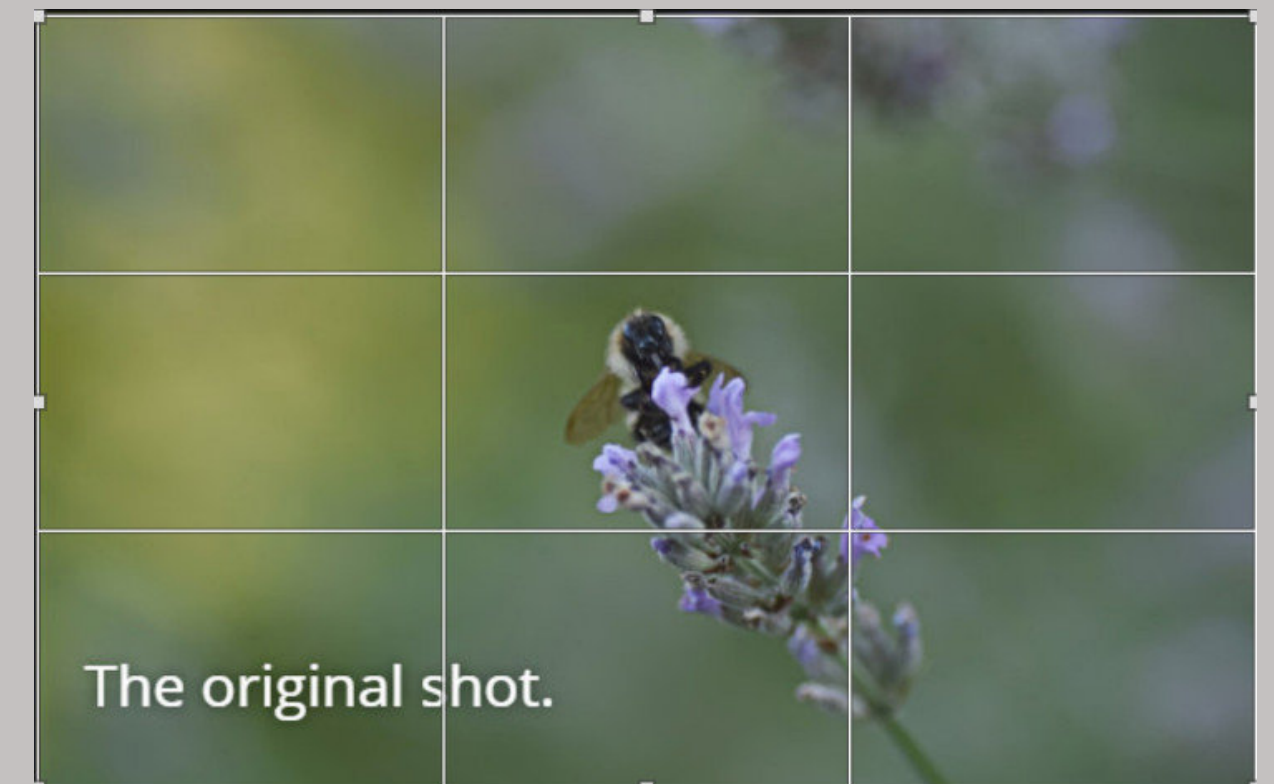
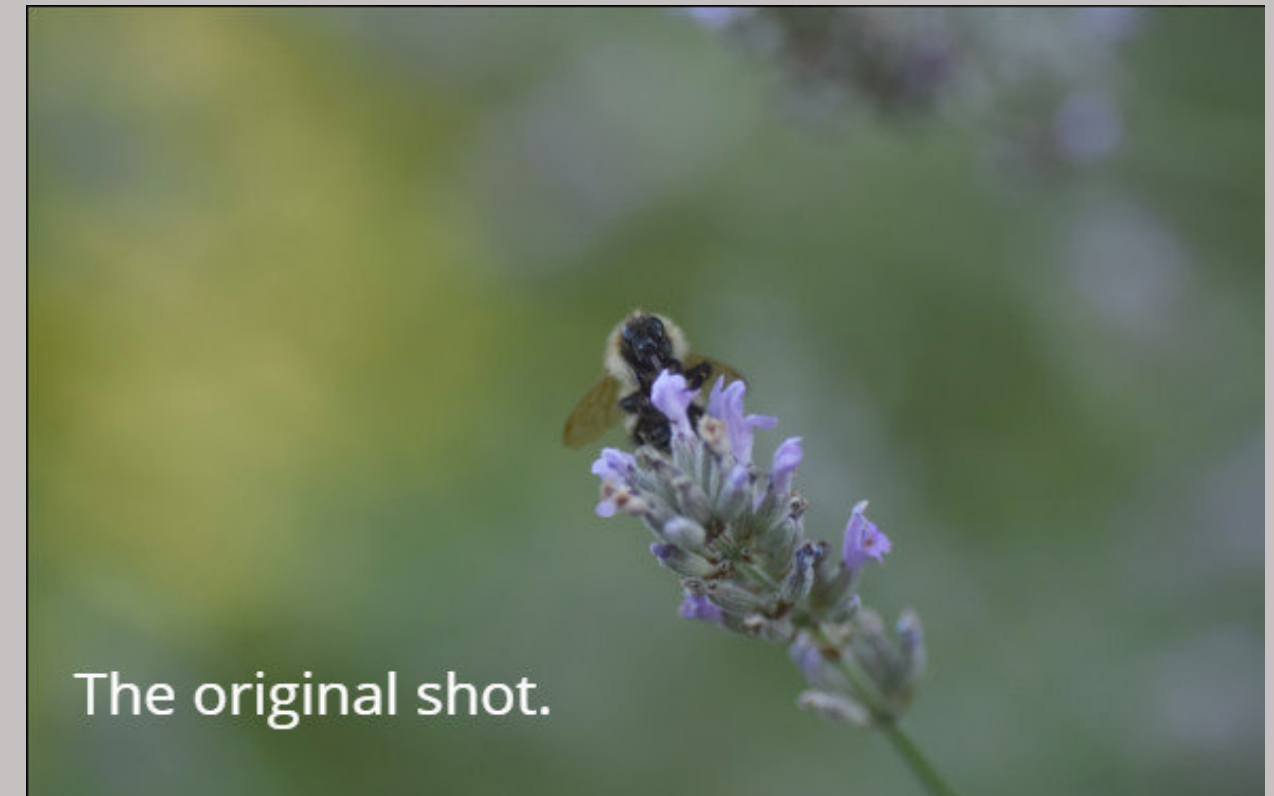
On the right is the original image, below is the same image with the thirds overlay applied.

Note the subject occupies two thirds of the frame.

Now while this is quite a pleasing image, I want to improve the composition by moving the subject so the stem of the flower is entering the frame from the right hand corner of the frame.

I want the head of the bee exactly on the third of the frame line from the right.

Nine elements of composition



Composition

Rule of Thirds

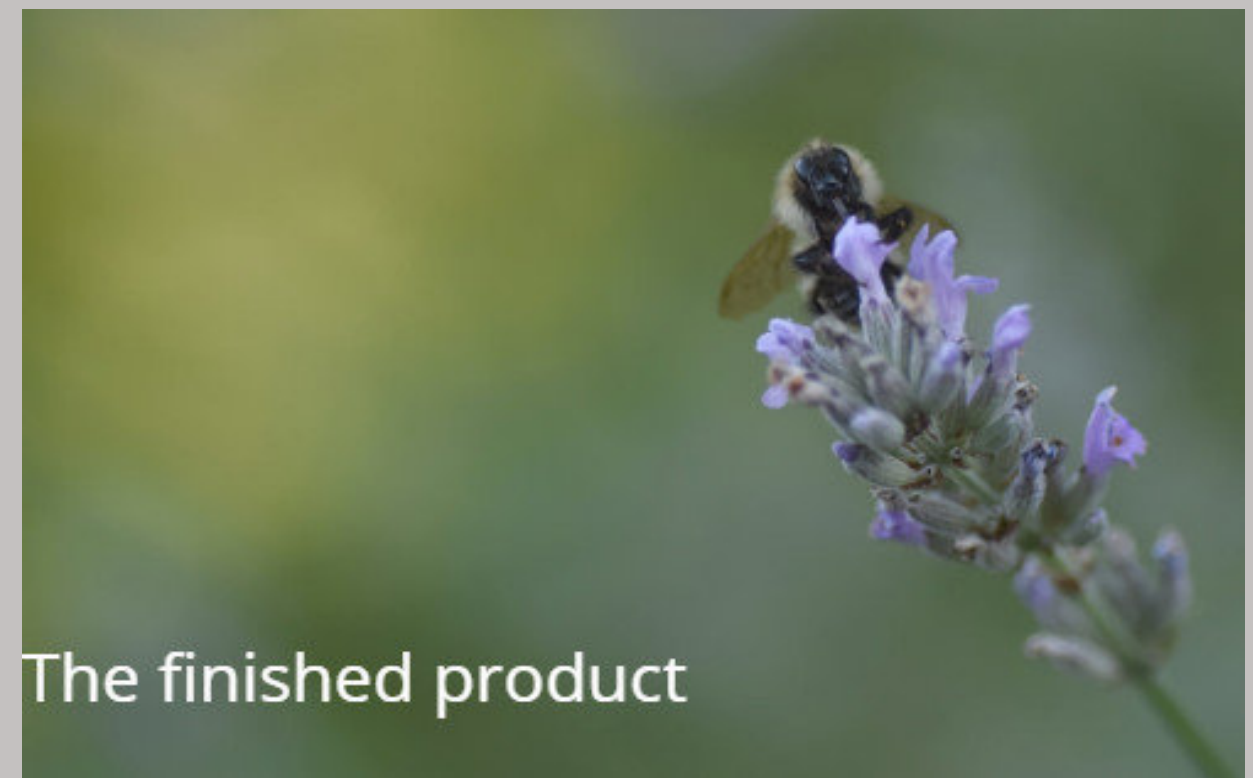
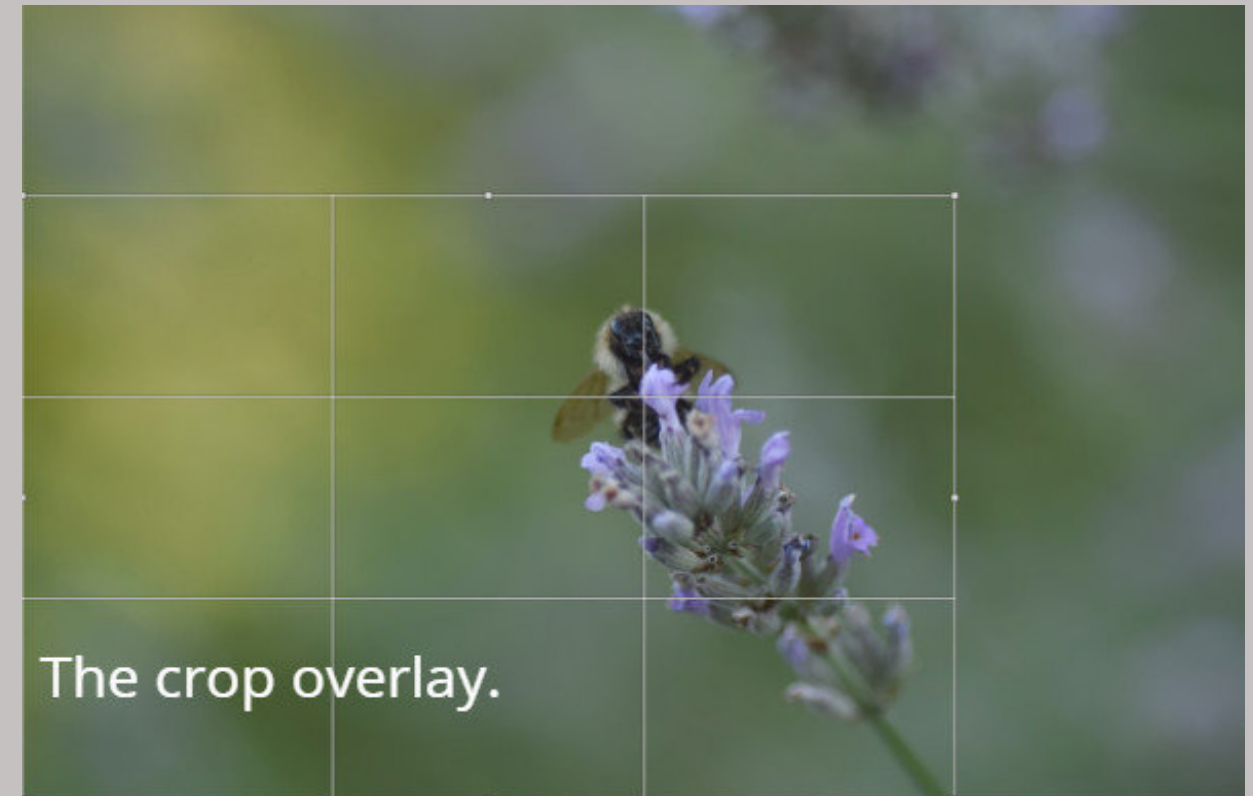
By placing the image so the flower is entering the frame on the diagonal, the flower is leaning in to the frame, pointing to the subject, the bee, leaving a pleasing negative space.

By using the flower as a lead in line to the subject, dynamism has been created, the focal point is accentuated by the blurred background, both giving the image punch.

It's very important, in nine times out of ten, to place the focal point, where the horizontal and upright lines of the overlay cross.

This principle is following the Fibonacci sequence and will, in the vast majority of cases, produce an aesthetically pleasing photograph.

Nine elements of composition



Composition

Rule of Thirds

I very often use this overlay when I'm cropping. Still the rule of thirds but with a twist.



Rule of Odds.

The rule of odds is simply the idea that things are most visually pleasing when displayed in odd numbers; 1,3 and 5.

This can be individual items or similar elements.

Keep your eyes open for this type of repetition.

Notice the three sets of couples?



Composition

Rule of odds

Note the three promontories.

Also the horizon is on the upper line of the rule of thirds.

Rule of Odds.

Three equestrians.

Note the frame within a frame?

Nine elements of composition



Composition

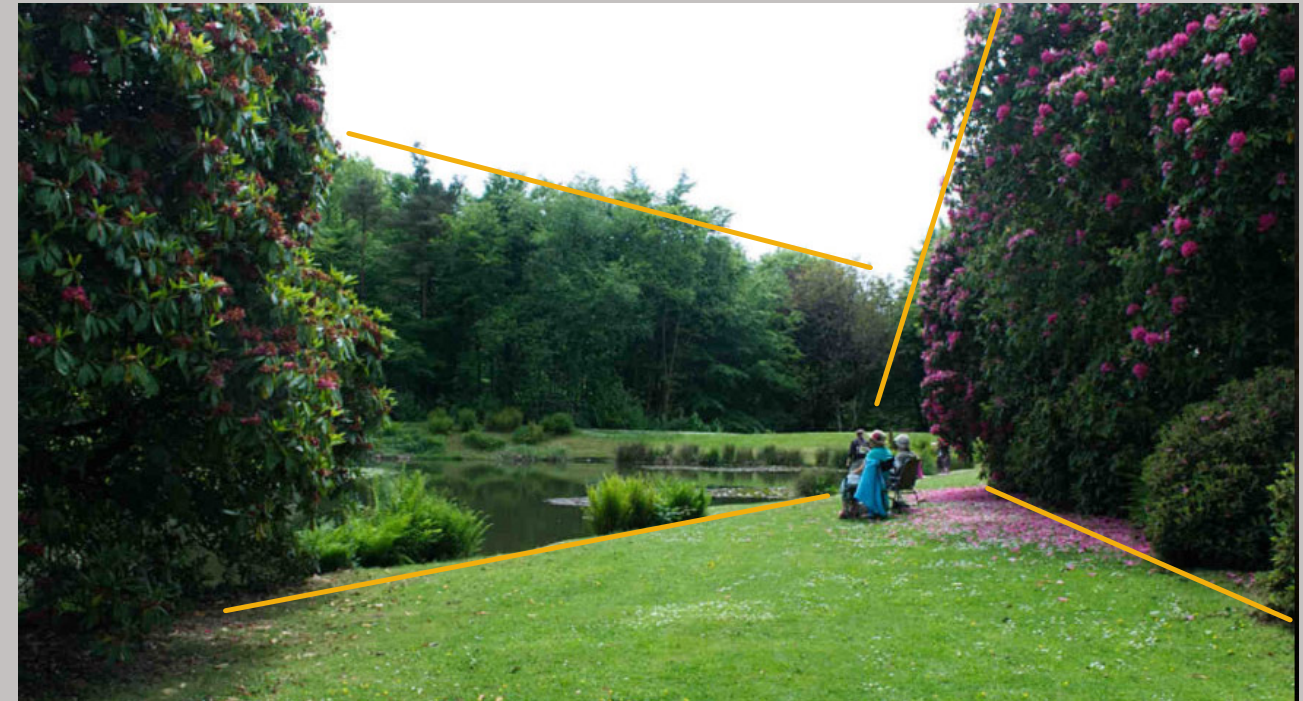
Lead in lines

As the name suggests, these refer to any line – straight, curved, parallel, converging, intersecting, etc. – that leads to the image's focal point.

This technique, literally, guides the viewer's eyes right to your intended target.

A good example of lead in lines, not only creating depth, but leading the eye to the frontage of the central building.

Nine elements of composition



Composition

Frame within a frame.

This one refers to placing your subject inside of a frame within your frame.

This can be taken as literally as your model physically holding a photo frame around their head while taking their portrait.

All of these work a little bit like lead-in lines, emphasising your subject or focal point.

Framing your subject doesn't have to be obvious, either; it can be done subtly and still be effective.

A frame within a frame can be really subtle.

Nine elements of composition



Composition

Selective focus of D.O.F.

Selective focus simply means keeping one area in focus while allowing everything else in the frame blur out.

Shallow depth of field, (also known as Bokeh), is often used to isolate a specific area or subject in a photograph.

Bokeh is prevalent in macro photography.....

..... nature photography.....

Nine elements of composition



Composition

Nine elements of composition

Selective focus of D.O.F.



.....and portraiture



Composition

Diagonals and Triangles.

Using diagonal lines and triangular shapes add dynamic tension to a scene that is more visually interesting.

Nine elements of composition



Composition

Repetition or Patterns

The repetition of patterns creates a sense of continuity and unity in a photograph; it is very appealing to the eye.

This element of composition works very well with the rule of odds where the repetition works exceptionally well in odd numbers – 1, 3, 5, etc.

Look for patterns in nature. Close ups of the centre of flowers shows the Fibonacci sequence and will always produce a strong image.

The fibonacci sequence is what this section, 'Composition', is based on.

Look it up - it's a fascinating subject.

Nine elements of composition



Composition

Repetition or Patterns

Don't be afraid to skew the camera to get an abstract view of a scene.

Nine elements of composition



Composition

Negative Space

Negative space refers to any area within the frame that is virtually unoccupied.

There is a fine line between negative space and dead space; negative space accentuates the subject matter - dead space detracts from the subject matter.

Learn to differentiate between the two.

Negative space

Dead Space

Nine elements of composition



Composition

Layers of depth

This element of composition refers to the foreground, the middleground and the background.

Generally speaking, a successful photograph combines all three of those layers.

I'm going to combine this part of the composition rules with the concept of hyper-focal distance.

Normally used in landscape photography, hyper-focal distance, at its simplest, is the focusing distance that gives your photos the greatest depth of field.

For example, consider a landscape where you want everything — foreground and background — to appear sharp.

If you focus on the foreground, the background will appear blurry in the image.

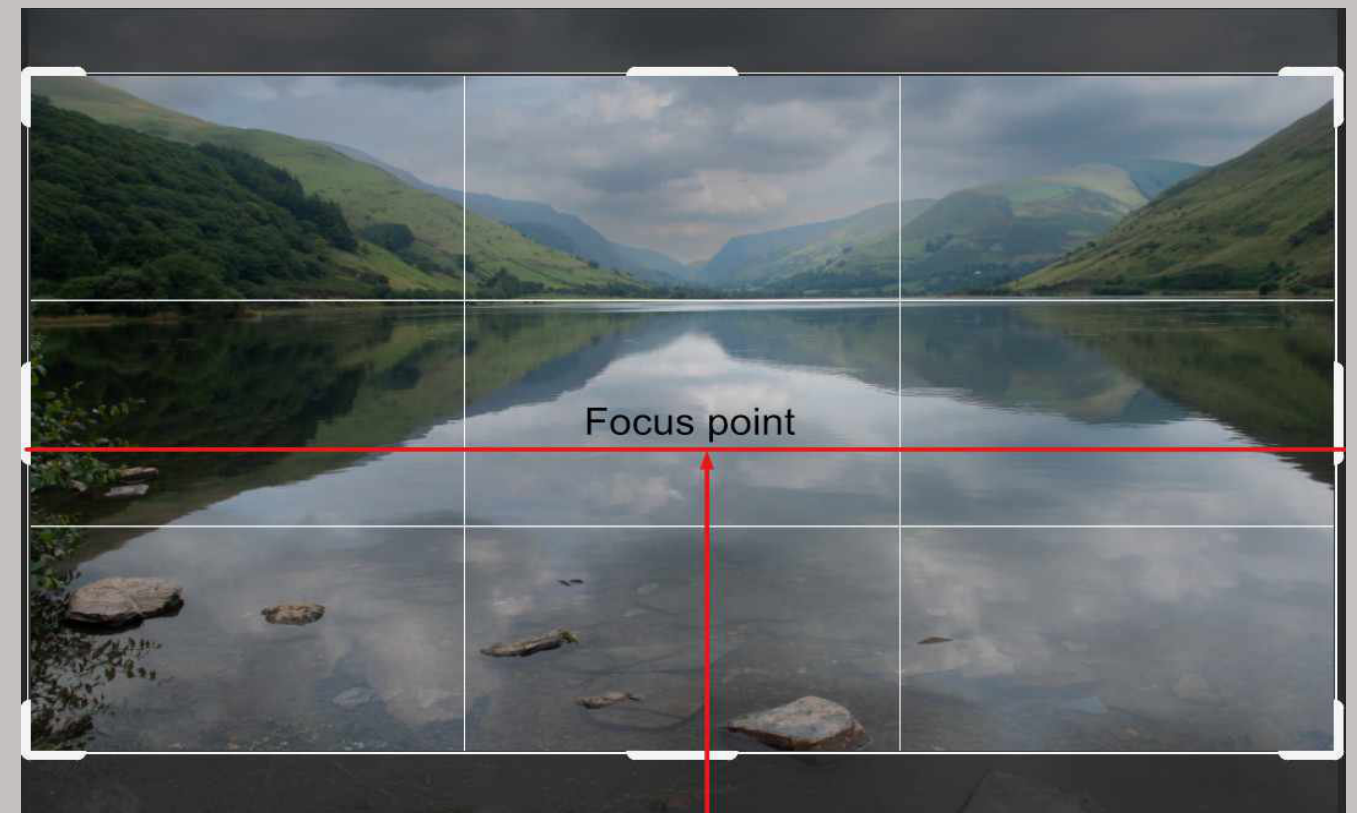
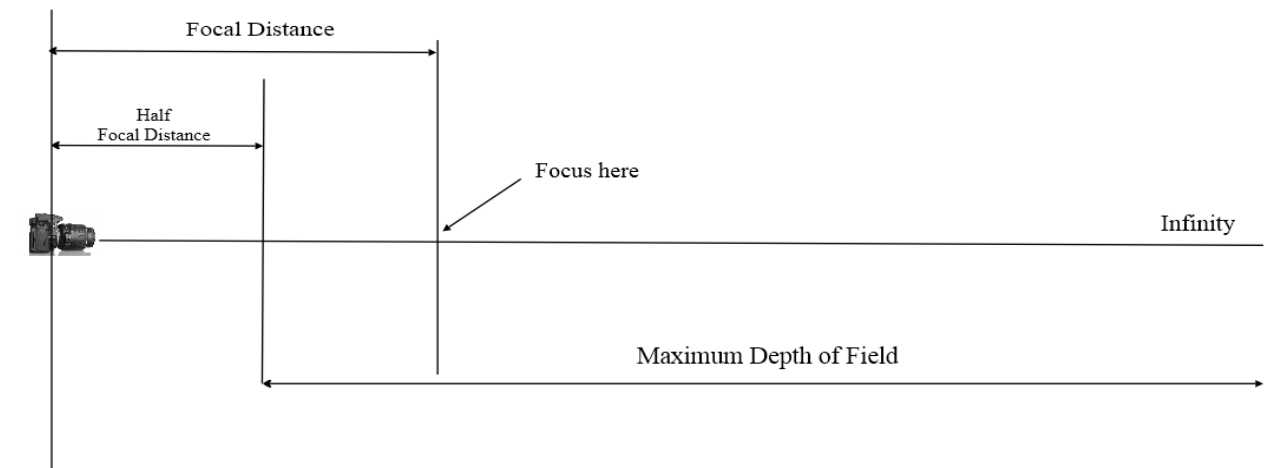
And if you focus on the background, the foreground will look out of focus!

How do you fix this? Simple: you focus at a particular point between the foreground and the background, which makes both the foreground and the background elements of the scene appear reasonably sharp.

This focusing point is called the hyper-focal distance.

Setting the aperture to f/9 and focusing on the hyper-focal distance, (focus point), will allow half the focal distance to infinity to be reasonably sharp

Nine elements of composition



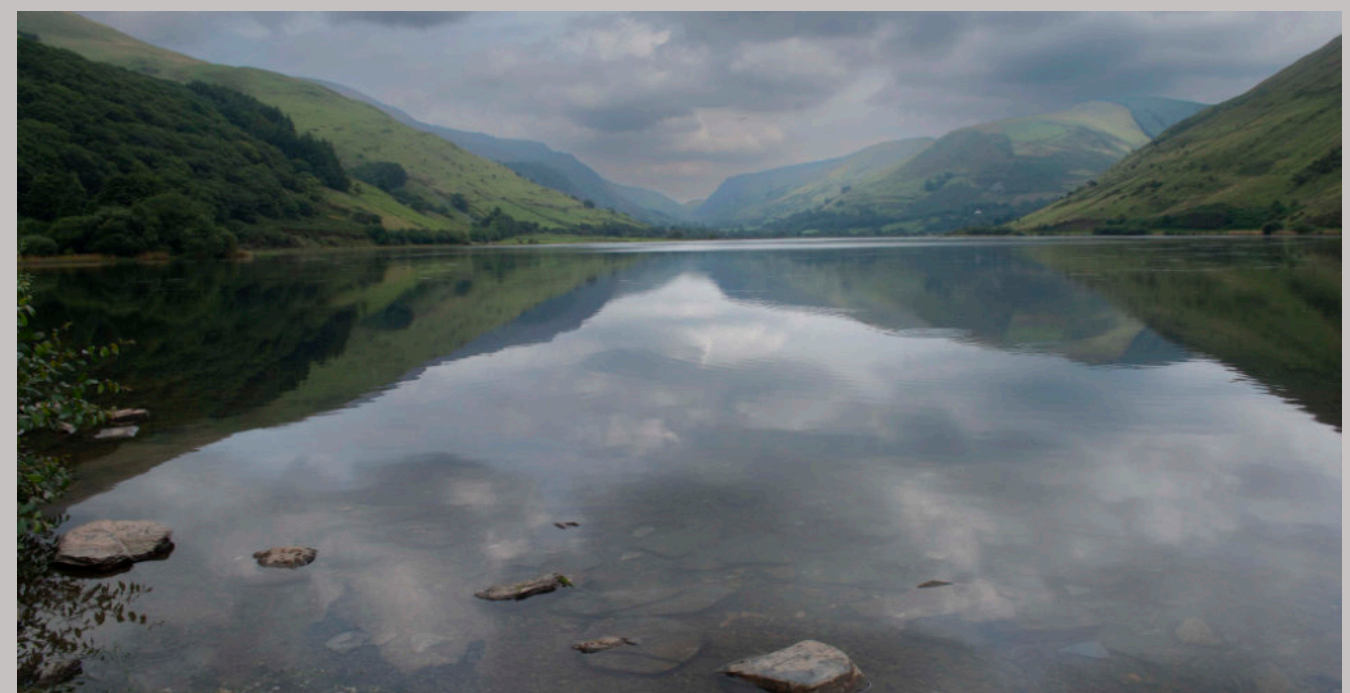
Composition

Layers of depth

Crop to the rule of thirds.....

.....For the final image.

Nine elements of composition



Composition

Layers of depth. (Manipulating Hyper-focal Distance).

In this photograph, the hyper-focal distance is the outcrop of rocks on which the subjects sit.

The foreground is reasonably sharp as it is within the hyper-focal plane.

However, the aperture has been deliberately opened making the background slightly blurred ensuring the subject is isolated and prominent.

Open the aperture too much and all the background detail will be lost; however with the detail captured as it is, it gives depth to the image.

It also gives a sense of 3 dimensional scale showing the precipitous nature of the habitat the subjects survive in and finally a sense of danger and drama.

Note, also the rule of odds.

Nine elements of composition



In this shot, the focal plane can be clearly seen. The aperture has been opened wide giving a very narrow depth of field.

The foreground is clearly out of focus and the background, while blurred, is detailed enough to give a sense of the habitat of the subject, making the subject stand out.



Composition

Nine elements of composition

Layers of depth

Again, the focal plane can be clearly seen, both front and back, really emphasising the subject



This principle can also be used to give a 3-D effect to the image.

So, experimenting with the aperture opens up a whole new world of possibilities



Composition

Layers of depth

Examples of images with a 3-D effect.

Nine elements of composition



Composition

Formats.

There are a number of formats you can choose from depending on your subject.

Panorama

Square

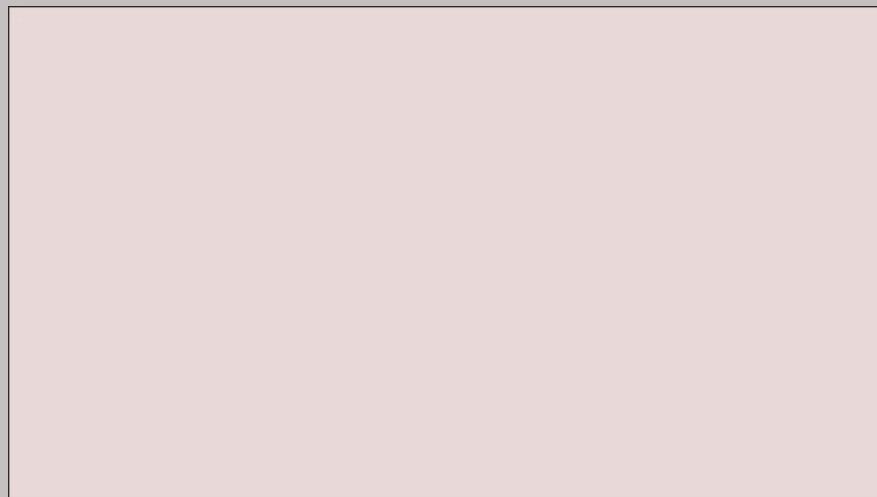
Portrait

Landscape

And finally, (Below), 16 X 9, which is my favourite.

16X9 is a ratio. It could be 1600 X 900 pixels, 16 X 9 inches/centimetres.

In fact most videos follow the 16 X 9 ratio as do all the images in this tutorial.



Formats

