What is Photography?

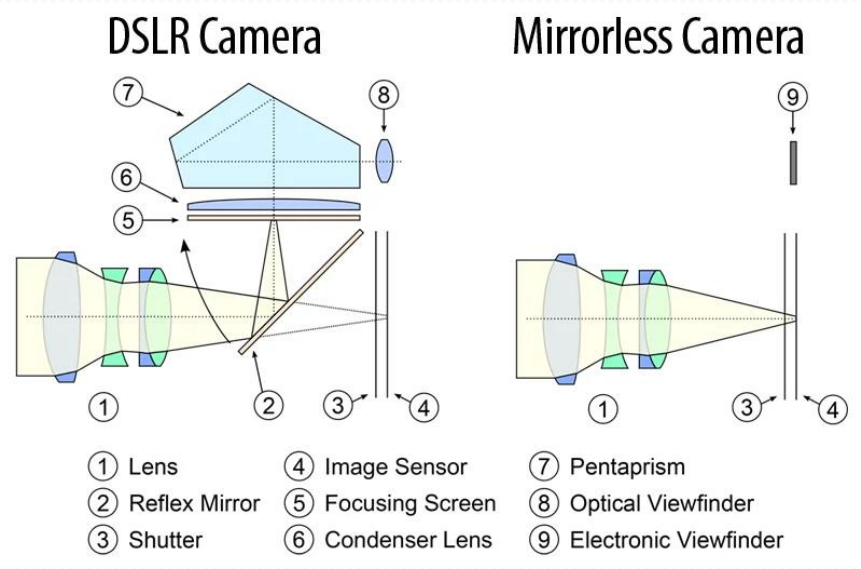
A Beginner's Guide

Produced by Gloucester Camera Club

How does the camera take a picture?

- A photograph is taken when light falls on the camera's image sensor and you press the shutter button to record the image into the device's memory.

- The 'shutter' is a thin metal curtain which passes over the sensor to control the exposure time.



Exposure

- The exposure is simply the amount of light reaching the sensor
- Two things control the exposure: -

1. The intensity of the light

2. The amount of time for which it is recorded

Correct Exposure

- The correct exposure is where the image looks how you want it to!
- Usually this is a faithful representation of the scene

- An overexposed image is too bright

- An underexposed image is too dark

How the Exposure is Controlled

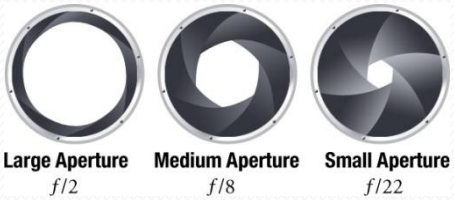
- There are 3 settings you can change to alter the exposure: -

1. The aperture
2. The shutter speed
3. The ISO number

- Adjusting these settings helps us to achieve the exposure we want.
- Sometimes this will depend on the subject - what's happening in the scene we want to photograph, as well as the available light.

Aperture

- The first way to change the exposure is to alter the size of the hole (called the ‘aperture’) through which light reaches the sensor.
  - Larger hole = more light
  - Smaller hole = less light



- The size is given by the ‘f number’ (e.g. f8, f11, etc)
- Each number represents half as much light as the previous one.
  - Smaller f number = larger hole = more light
  - Larger f number = smaller hole = less light

Shutter Speed

- The second way to change the exposure is to alter the time for which the shutter is open (the time that the sensor is exposed to light from the lens):
- Longer time = more light
- Shorter time = less light

- The shutter can be opened for set periods usually expressed as fractions of a second.
- For example: -
  - 1/125th of a second is twice as long as 1/250th
  - 1/250th is twice as long as 1/500th

ISO

- The third variable is the ‘ISO’ setting.
- The setting controls how sensitive the sensor is to light, so each ISO setting is twice as sensitive as the previous one.
  - Smaller ISO setting = less sensitivity
  - For example: ISO 200 is twice as sensitive as ISO 100

Note: ‘ISO’ means ‘International Standards Organisation’ and the numbers refer back to the sensitivity (or ‘speed’) of the photographic film that was used before the digital age.

Exposure Settings

- If we want to, we can achieve the same exposure by using different combinations of the 3 exposure settings:
  - For example, at ISO100 on a sunny day, an typical exposure might be 1/125th of a second at f8.
  - But we could also use half the size of aperture for twice as long, which is 1/64th of a second at f11.
  - Or twice the size of aperture for half as long, which is 1/250th of a second at f5.6.
- In each of these examples, the total amount of light reaching the sensor is the same.

Why Change the Settings?

- The choice of settings has other effects on our final picture.
  - A larger aperture reduces the nearest to furthest distance from the camera that is sharp (in focus). This is called ‘depth of field’.
  - A faster shutter speed reduces the effects of motion and camera shake (the image may be blurred if the subject or the camera moves during the exposure).
  - A high ISO setting can introduce ‘noise’ and the picture may look speckled (because of errors introduced by the increased sensitivity), especially if you view on a big screen.

Camera Controls

- Cameras usually have four operating modes:
- Automatic
  The camera sets aperture, shutter speed and ISO.
- Aperture Priority (Av)
  The user selects the aperture and the camera sets the shutter speed.
- Shutter Priority (Tv)
  The user sets the shutter speed and the camera sets the aperture.
- Manual
  The user sets aperture and shutter speed.

Hints and Tips

- Fully automatic mode will usually produce a perfectly acceptable image but is the result exactly what you wanted?

- In most situations where the subject is not moving much, such as landscapes and portraits, many photographers prefer to use aperture priority mode. They set an aperture to control ‘depth of field’. The shutter speed is unimportant until it becomes so slow that camera shake could affect sharpness.

- If shutter speed is less than about 1/100th second, you may need to steady the camera on a tripod or a hard surface such as a table, fence post, wall, etc. Alternatively, the camera may have electronic stabilization, which can help up to a point, or select a higher ISO setting.

- Mobile phones and some cameras have a mode called ‘scene detection’ where, you can choose the type of subject such as sports, landscapes, portraits, etc or let the camera choose automatically.

Hints and Tips

- Get to know how your camera or phone's camera works by *reading the instructions* and becoming familiar with the various controls and what the buttons on the screen actually do.
- Practice by taking pictures in different situations and trying out different settings.
- If you don't like the result, there is always the 'delete' button!
- When you are happy operating your phone or camera, it's time to start experimenting with composition and the more artistic side of photography.
- Don't forget that creating a picture that is pleasing to the viewer (whether that's you, friends, family or anyone) is massively more important than the kind of camera (or its age or cost) that you are using!

Photo Composition

- Once you have sorted the technical parts of the photograph, which is easy these days as camera's and phones can take care of all this for you in automatic modes until you are ready to take control of settings yourself, the composition is probably the most important part of a photograph.

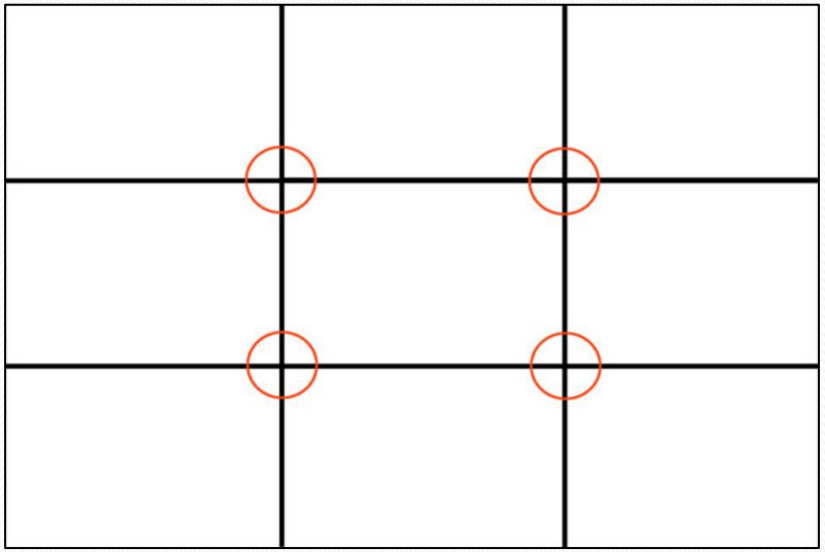
- In order to begin to understand composition, there are a number of guidelines of composition. The most commonly known and used are "The Rule Of Thirds" and "Leading Lines"

The ‘Rule of Thirds’

This is where we imagine the image to be divided into three equal columns and rows.

Parts of the subject may be placed at the intersections, known as the ‘thirds’, to give a more pleasing effect.

Take a look at the following examples.



The ‘Rule of Thirds’

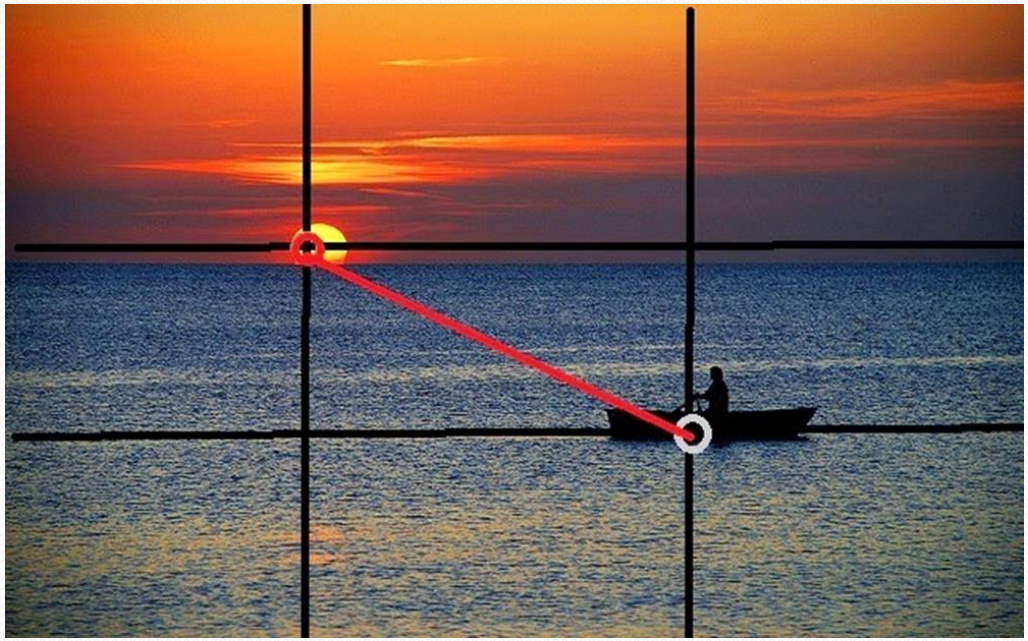
- Which of the following images do you feel looks best?

The ‘Rule of Thirds’

- Most people choose the right hand image, which uses the ‘Rule of Thirds’

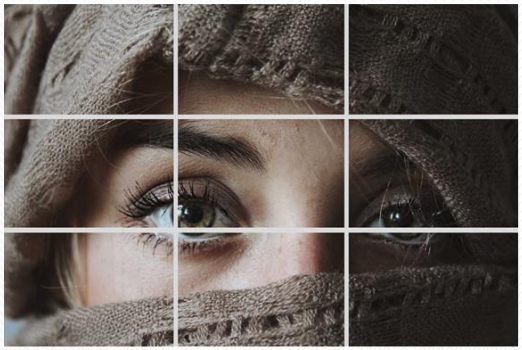
The ‘Rule of Thirds’

- Here, you can see that the sun and the boat are on intersections - often called “Hot Spots”

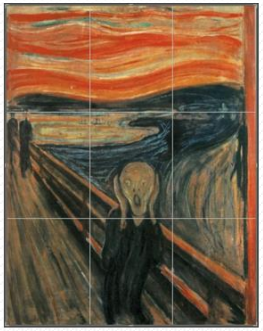


- Note how the horizon lies along the top third.

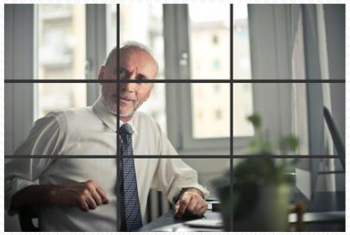
Examples using the ‘Rule of Thirds’



Dominant Eyes Placed On Hot Spots

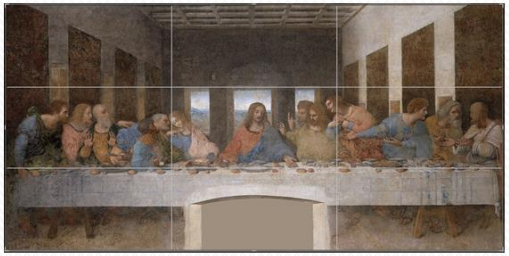


The Horizon in “The Scream”



Subjects Placed On Left or Right Third

Scenes In Film Use Thirds

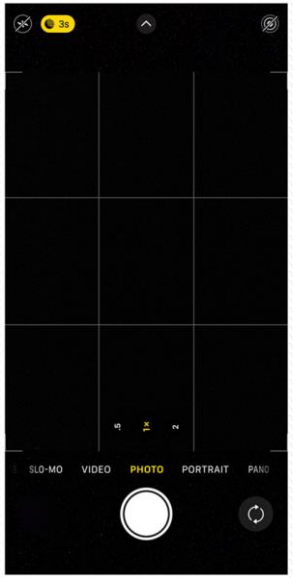


Da Vinci’s – The Last Supper

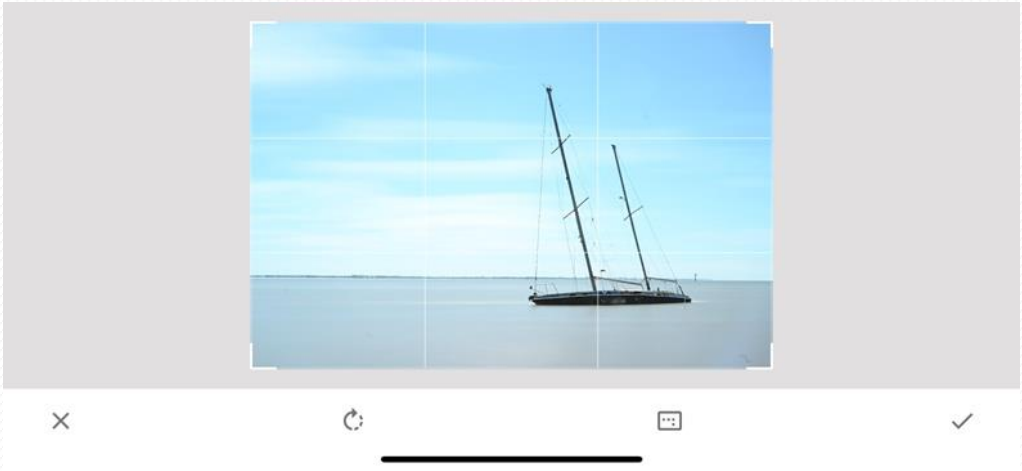
Classic Photographs

Help using the ‘Rule of Thirds’

- Most cameras and phones can put grid lines on the sceen to help your composition:
  With an iPhone go to Settings > Camera > Grid.
  Try to find it on your camera or phone



- This is how it appears using the mobile app Snapseed



Symmetry

- Instead of ‘Thirds’, this photo uses ‘Symmetry’, which is where elements of the image are ‘balanced’ either side of a vertical or horizontal centre line.

Leading Lines

- Leading (or ‘Lead-In’) Lines are a compositional technique where you, the photographer, use features in the scene to guide the viewer’s eye through the photograph.

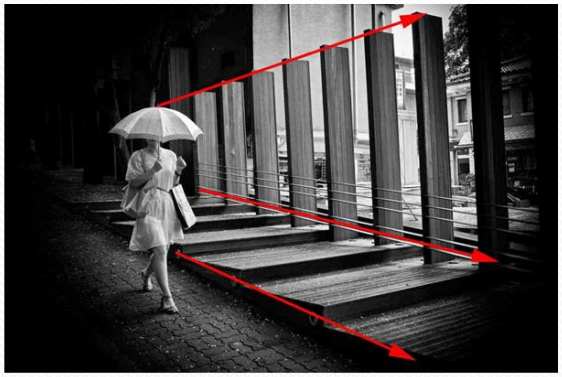
Here, the photographer has used the path to take the viewer from the front of the image, though to the tree…

The leading line also continues beyond the tree along the horizon

Leading Lines

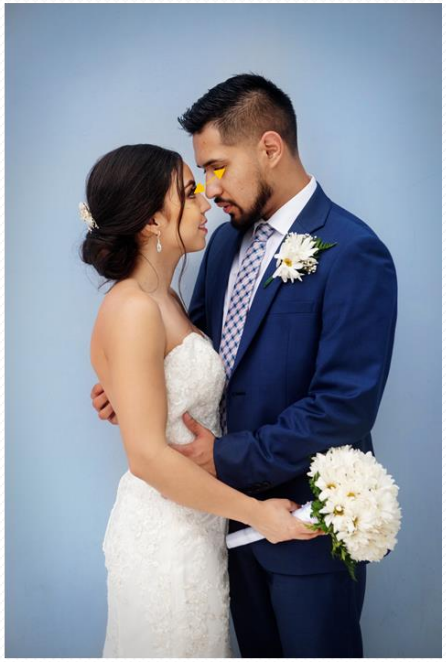
- Leading Lines can often be found in nature

Leading Lines with People



To Emphasise Direction Of Travel

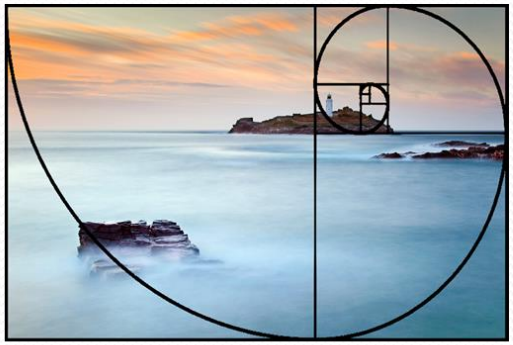
To Bring Attention To The Subject



Line Of Sight Is Often Used To Connect People

Other Composition Guides

Framing



Golden Ratio

Symmetry

Diagonal Lines

Odd Numbers

Perspective

- Taking a different viewpoint or changing the relationship between two (or more) objects within the image can make a 2 - dimensional photograph feel like a 3 - dimensional scene.

Get down low

Get up high

Look up

Having Fun with Perspective

- Try something like this with a building or object near you: -

As tall as the tower

Hold it up

Take it away

Photo Editing

- Now you have taken your picture, you might want to alter or improve it’s appearance.
- Using an editing app you can change the brightness, contrast or maybe the colour or just re-frame part of the image to cut out things at the edges.
- Phones and cameras have built-in methods for basic editing.
- You can also consider a free or paid-for app or PC software that will allow you to do more.

Photo Editing

- Photoshop may be the most well known but it is expensive and takes a lot of time to learn but you can do almost anything in it to change your picture 

- GIMP is a free alternative 

- Snapseed is a powerful editor for use in mobile phones 

- There are many more apps to consider. Try out the free ones first.

Activity

- To get started you could try out this puzzle with your camera or phone.
- Go for a walk (any place will do) and look for shapes in the surroundings that you can imagine forming into letters of the alphabet.

- This series of pictures spells the name ‘Paige’.
- Don’t see it? – See the next image

Activity

- Have a look below to find the hidden letters.

- Now that you know the formal elements and the basics of photography, try and retake your photos to spell out a name and see if you can incorporate the elements you have learned about, to take a more visually interesting picture. Good luck!