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Camera Corner: Lenses and filters

CAMERA CORNER: LENSES AND FILTERS

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There are in principle, two types of lens - Prime Lens and Zoom. Prime lenses have a fixed focal length, whereas a

zoom lens will have a variable focal length, enabling you to zoom in and out. This means that a zoom lens is more flexible, and will inevitably be the type of lens you have with a compact or bridge camera, when the lens is a fixed

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part of the camera.

If you have a DSLR camera you will be able to change between prime and zoom lenses according to circumstances.

The jargon

The spec of a lens is written on the barrel or round the border on the front. There are two specs for lenses that are common to all makes, and others that are specific to a particular manufacturer.

The latter include references to quality of glass and suchlike, and you would have to check on the manufacturers website to know what they mean. For example, on a Nikon Lens you may see 'G' which means it will not have a focusing ring and you can only focus it via the automatic focusing in the camera body. The two specs common to all lenses are the Focal Length and the Maximum Aperture.

Focal Length

The focal length of a prime lens is fixed, so it will say on the barrel '50mm' for example. A zoom lens will give the range, for example '28-200mm'. The focal length determines the angle of view. So, if you are taking a landscape picture at the minimum focal length you will capture a wide vista, whereas if you zoom to the maximum focal length things in the distance will look closer, but you will only be able capture a narrower vista.

The human eye works at a focal length of 50mm, and therefore cameras in the old 35mm film days came with a standard 50mm lens. These lenses would take a picture of a scene with exactly the same width of vision as you would see it without moving your eyes. Any lens with a shorter focal length than 50mm was considered a wide-angle lens, and any focal length over 50mm would be considered zoom. This principle is the same today, except the numbers are slightly different.

Instead of recording our pictures on 35mm film we record them on a sensor, and in all but the most expensive cameras, the sensor is smaller in size than 35mm film - about 2/3rds the size in fact. Ignoring the physics theory behind it, this means that lenses on a digital camera have effective focal lengths of one-and-a-half times what it says on the box. So on a digital camera a lens

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at 200mm zoom will give you the equivalent zoom to a lens at 300mm on a film camera, and will give a comparative view to the human eye at 31mm rather than 50mm.

So, that is the theory behind focal length, but how do we use it to get good pictures?

If you take a picture using the zoom, the lens will flatten distances, whereas on wide angle distances are exaggerated. This mostly shows up in subjects close to the lens. If you are using a zoom lens to take a portrait it is better to stand a little distance away and use a bit of zoom, than to stand close and have the lens on wide angle. If you do the latter the nose and mouth will be exaggerated, whereas at about 60 to 80mm the picture should look natural.

What is Digital Zoom?

A lot of compact and bridge cameras refer to 'Optical Zoom' and 'Digital Zoom'.

Compact cameras in particular have small lenses, which even on full zoom only extend a couple of inches or so. This means that optically (in other words like binoculars or a telescope) they can only zoom to a limited extent. However, often you get tremendous zoom with these cameras, so how is that possible? The answer is 'Digital Zoom'.

What the camera is doing is showing you only the part of the picture that will be recorded on the centre of the sensor. It is rather like when you zoom in on a picture on the computer. So if you have a 10megapixal camera, the resultant photo will only be 1 or 2 megapixels because the outer part of the sensor is not being used. As a result, the photo may look good on the camera, but the resolution may not be enough if you want a good print.

Aperture

You will see numbers on the lens barrel written in this format '1:2.8' or 'f2.8'. In the case of a zoom lens there will be a range – 'f2.8-f5.6' for example.

Lenses have an internal diaphragm operated by the camera, which is opened to let the light through when you take a photo. The size of the opening is variable, and these numbers relate to the maximum possible size of the opening for that lens ('Aperture'). The 'F' number is actually a ratio,

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and the smaller the 'F' number, the larger the opening. So a lens with a maximum aperture of F1.4 is better, all other things being equal, than one with a maximum of F3.5 for example.

Aperture is important to control the amount of the photograph that is in focus, and a large aperture is also important in low light situations.

Photographers use aperture to make subjects stand out in a photo by putting the background or surrounds out of focus. I will go into this in more detail in a later article.

Filters

There are many types of filters on the market, but there are three types that are most likely to be useful.

UV

UV filters have traditionally been used to prevent haze in pictures on hot days. Modern digital camera sensors do have a filter system that has the same effect, so UV filters are not really necessary any longer for this purpose. However, they have no other effect on a photo and will provide a relatively cheap protection for your lens. Better to break a piece of cheap glass than an expensive lens.

Polarizing filter

These filters work the same way as polarizing sunglasses and cut out glare. They are good for photographing reflective surfaces such as water or glass, and can make blue skies even bluer.

ND Graduated filter

These filters usual come as a set with different strengths, and are basically glass with a graduated tint that goes in front of the lens. They are particularly good for the bright sunlight in Spain, where the sky often comes out weak in our photos. By having a grey tint in front of the top of half of the lens the sky is less exposed and the colours look much stronger.

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Some questions and answers will be printed in the next issue, and whilst we will do our best, we cannot guarantee to answer every email received.

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