Digital Format Notes:

Before you rush out and buy read these notes:

When referring to the images taken by digital cameras the terms Raw and Jpeg occur frequently in these notes and mean:

Raw, the data saved exactly as the camera sees it, on most cameras this results in a file size around 20Mb but on professional cameras can be much larger, cameras recording in Raw format can also record in Jpeg format.

Jpeg, a compressed version of the raw data, on most cameras it results in a file size around 4Mb to 6Mb. Cameras designed exclusively for the Jpeg format cannot record in Raw.

If you wish to carry out processing on the image on your computer in a specialist program it is better to use the Raw file as it gives you more room to manoeuvre the image. It also has the advantage that it doesn't loose data, every time you open a jpeg it looses a little information.

Focal Length: The length of a lens stated as so many mm, in the 35mm and digital camera world the field of vision of the human eye is covered by a lens of around 50mm, so a 35mm lens is called a wide angle because it covers a wider field of view and a 90mm lens is a Telephoto because it acts like a telescope and so on.

Apertures are the adjustable opening of a lens and are expressed in F numbers and work in reverse to the way you would expect them to. An Aperture of F2.8 is exactly half of an Aperture of F2 and F4.0 is half of F2.8 etc. Faster apertures are useful in dull light and for certain aspects of advanced photography but the downside is they cost more.

Interchangeable Lens Camera: A camera on which the lens is not permanently fixed to the body. The advantage is that you can buy lenses in different focal lengths and apertures to suit the type of photography you are interested in. The downside is, of course, that they cost more.

Sensor: The part of the camera that records the image, it has replaced film. Sensors come in various sizes and capacities, as the sensor gets bigger in size it can record more detail in higher quality.

Viewfinder: There are basically three types, the screen at the back of the camera which can be difficult to see in strong daylight, Eye Level on Single Lens Reflex Cameras which sees directly out through the lens, it can be worked optically or electronically and Eye Level on Rangefinder Cameras which is purely an optical device sized to cover the field of view of the lens.

Digital Cameras Generally.

All digital cameras are basically mini computers with lenses attached and as such have a limited life span, as with any computer the one you buy today has probably already been superseded by one on the production line. From this point of view it therefore makes sense to purchase an interchangeable lens camera the lenses for which can be reused from body to body.

Compact Camera

Basic With a Fixed ie Non Interchangeable Zoom Lens

Usually small neat designs with a fixed viewing screen which fit handily in the pocket.

Typically these have a non interchangeable zoom lens of focal lengths anywhere between 25mm and 500mm (or longer). For use as a day to day walk around camera a lens in the order of 28mm to 200mm should cover most subjects.

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The lenses are usually not very fast having maximum apertures of around F3.5 at the wide end and perhaps F 5.6 or so at the long end, so you need good light.

In addition to normal photography they should also be capable of taking close ups of small objects and be equipped with a built in flash. The usual digital format is .jpeg.

The main problem with this type of camera is the size of the sensor most, being 1/2.3" ie approximately 6.17 x 4.55mm.

There is nothing wrong with using this type of camera provided you are prepared to work within it's limitations, in fact it will probably do more things than you realise. It makes an excellent starter camera where you can discover what works for you.

Enthusiast Compact

As a breed they are usually a little larger than the basic type, they more or less come in these 3 variations:

A/ Those With Non Interchangeable Fixed Focal Length Lenses usually of either 28mm or 35mm focal length (the exception being Sigma who makes models with 45mm, 50mm and 75mm lenses) and large apertures of F2.0 or F2.8. This type of camera is usually but not always the camera of choice for street photographers.

These cameras are either equipped with standard enthusiast size sensors of 1/1.7" i.e. 7.44 x 5.58mm or more recently large APS-C i.e. 23.5 x 15.6mm sensors

B/ With Non Interchangeable Zoom Lenses usually somewhere between 24mm and 140mm focal length but with correspondingly larger apertures of up to F1.4 at the wider end and 2.8 at the long end, nearly every maker has one or two models in this range

C/ With Interchangeable Lenses, not very many in this field, the two which spring to mind are the Pentax Q7 with a 1/1.7" (7.44 x 5.58mm) sensor and the Nikon 1 with a 1" sensor (13.2 x 8.8mm). Some models in the Nikon 1 range have a built in electronic viewfinder in addition to the viewing screen. Both Nikon and Pentax have developed a range of interchangeable lenses for these cameras and they also have adapters which allow the use of lenses from their standard DSLR Camera (Digital Single Lens Reflex) line up but not all the functions of these lenses can be utilised. Once the lens is mounted none of these cameras are really pocketable.

All enthusiast cameras have a greater degree of control over the workings of the camera - almost as many controls as can be found on a DSLR - allowing you to adjust how the image is created..

Most if not all of the above types are capable of recording in both Raw and Jpeg formats and are a viable alternative to a DSLR for those who do not wish to carry a large camera and accessories.

Bridge Cameras

Are a cross between a Compact Camera and a DSLR, all have a Non Interchangeable Zoom Lens with focal lengths starting around 25mm and extending up to 1400mm and most have an eye level electronic viewfinder though at least one has an optical tunnel type viewfinder.

All have small sensors, some are capable of recording in Raw format though most record only in Jpeg. Most are fitted with lenses having small apertures and so work better in good light. On some cameras the zoom function is mechanically operated by the camera on others it is

operated by hand. Bridge cameras are much larger than compacts and can be as big and heavy as a small DSLR fitted with a standard kit lens.

Interchangeable Lens Rangefinder Cameras

Interchangeable Lens Rangefinder Cameras derive from the original screw mount Leica design of 1926 later radically modified into the M series bayonet design in 1958. These cameras were/ are equipped with an optical viewfinder in which,on later models, bright line frames corresponding to the field of view of the chosen lens are automatically reflected.

The cameras had/have an optical rangefinder, basically a second little window between 40 and 65mm from the viewfinder which reflects a second image into the viewfinder, focusing the lens causes the second image to merge with that in the viewfinder.

Because the system does not look out through the lens the camera body is much thinner than that of a single lens reflex camera so the distance between the lens mount and film/sensor position, the focal plane, is much less.

Because of the limitations of the focusing system until recently the cameras could be equipped with fixed focal length Interchangeable lenses ranging from 12mm wide angle to 135mm telephoto, the use of zoom lenses was not possible. With the introduction of Live View on the latest Leica M (Type 240) model the use of zoom lenses is now possible.

Leica lenses are very highly regarded and many people would like to use them on their single lens reflex cameras but because of the short mount to focal plane distance of rangefinder cameras it was not possible to get the lenses to focus to infinity as the depth of the mirror housing acts in a manner similar to an extension tube.

With the advent of thin Mirrorless camera bodies - see below - the use of rangefinder lenses became possible.

Mirrorless Interchangeable Lens Cameras

Digital Single Lens Reflex Cameras allow you to see the view through an optical pentaprism viewfinder and a mirror which reflects the image as seen by the lens into the viewfinder.

Mirrorless Cameras are essentially Single Lens Reflex Cameras which have removed the pentaprism viewfinder and mirror box making them smaller and lighter. They rely on electronics to provide the view and come in two variations:

Without Viewfinders, these rely on the rear viewing screen in the same way as compact cameras, some allow the use of an accessory add-on electronic viewfinder.

With Viewfinders, in addition to the rear viewing screen these have a built in electronic viewfinder which can be fixed in a permanent position or is retractable. Additionally one manufacturer has developed a Hybrid Optical/Electronic viewfinder.

Digital Single Lens Reflex Cameras

As noted above Digital Single Lens Reflex Cameras allow you to see exactly what the lens is seeing, this comes at the price of increased size, weight and cost. The size and weight of the cameras and lenses is generally in proportion to the sensor size.
There are 4 broad types based on sensor size approximately as follows:

17.3 x 13mm Sensor = Four Thirds Interchangeable Lens Cameras Developed mainly by Olympus and Panasonic, third party lens manufacturers also make for this format.

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18 x 24mm Sensor = APS-C Interchangeable Lens Cameras, nearly every manufacturer of Single Lens Reflex Cameras makes for this format

36 x 24mm Sensor = Full Frame Interchangeable Lens Cameras, Canon, Nikon and Sony have cameras in this format, it is more expensive than the previous types. Raw file sizes can be 80Mb or more

44 x 33mm Sensor = Medium Format Interchangeable Lens Cameras, the size of the sensor varies slightly between manufacturers, no matter what way you look at this format all cameras are bulky, heavy and expensive. Hasselblad, Pentax, Phase 1and Leica all have cameras in this format either as a dedicated digital camera or as a digital back for their film cameras. Pentax is the least expensive starting at around €8,500 for the body, lenses, naturally, extra. Raw file sizes can be 225Mb or thereabouts.

APS-C Single Lens Reflex Cameras (DSLR) : The more money you pay the more versatile the camera in theory, but after the first flush of enthusiasm people usually settle down to using only a small set of the features available, so you really should think about what you will use before you buy, the main points to look out for are:

Image Stabilisation, Shake Resistance and Vibration Control: All basically manufacturers names for the same thing. By inserting additional elements either into the camera body or the lens the aim is to reduce image blur caused by camera shake, Olympus, Pentax and Sony have it in the camera, Canon Nikon and Panasonic have it in most but not all lenses.

Controls: All cameras feature independent controls for the aperture and shutter, some also allow access to the sensor speed setting (ISO) and video recording control. After that it's really up to you to decide which controls you really need and which camera provides them to your satisfaction, don't rush into buying something until you are really happy with it.

Viewing Screen: In addition to eye Level Viewfinders most DSLR Cameras have a fixed rear viewing screen, but some have a Tilting Screen which adjusts up and down and others have a Fully Articulated Screen which can be turned in almost any direction, it's up to you to decide which suits you best. Adjustable screens are handy for overhead and macro work.

Full Frame refers back to the standard 35mm Film camera negative format of 36 x 24mm and are more or less bigger and more expensive versions of APS-C cameras with bigger bodies and lenses, heavier weight and more cost, but they do produce images of higher quality.

Medium Format here means digital format of around 44 x 33mm frame size, medium format in the film world means approximate negative sizes of 45 x 60mm, 60 x 60mm and 60 x 90mm among others.

Because of the small market share occupied by Full Frame and Medium Format cameras and their cost of development they have a much longer life cycle than any other type of Digital camera. Compared to APS-C and Full Frame cameras they are huge in size, weight and cost and rely for professional use.

Because Full Frame and Medium Format cameras generate such large file sizes you will most likely require a computer with the latest processor with high levels of ram and large amounts of storage.

Alternative Full Frame and Medium Format: As an alternative to purchasing a full frame or medium format camera, many enthusiasts still shoot in film, mainly Black & White, then scan the developed negatives into the computer and adjust them digitally.

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Black & White Film is available in 35mm Cassettes, 17m Bulk film drums for home loading into cassettes, and as 120/220 roll films for 6o x 45mm and 60 x 60mm negatives and in 4” x 5” sheets for technical cameras. Black & White home developing equipment and chemicals are still available.

The supply of Black & White Infrared film is limited.

The supply of Black & White Reversal Film, for making Black & White slides is limited.

Colour Negative Film is available in 35mm Cassettes and 120/220 Rolls, colour film is tricky to develop at home but there are still laboratories who can undertake the work.

Colour Reversal Film for making colour slides is available in 35mm cassettes, 120 rolls and 4” x 5” sheet film, the processing of colour negative film really requires a specialist laboratory.

Medium format film is available today as either 120 or 220, 120mm has a paper backing on which exposure numbers can be seen through the red window on the rear of the camera.

220 film is approximately twice as long as 120 film and so gives approximately twice the number of exposures but it has no paper backing, it comes with only a leader and a trailer which makes it thinner. Because it has no paper backing with exposure numbers on it you have no idea where you are exposure wise. Being thinner, some cameras require an adjustment of the film pressure plate to correctly focus the lens on the film.

Common Medium Format exposures on 120 film.

6 x 4.5 = 15 or 16 exposures

6 x 6 = 12 or 13 exposures

6 x 7 = 10 exposures

6 x 8 = 9 exposures

6 x 9 = 8 exposures