

Cameras - Translating the Tech-Speak

This information is aimed at those who are unsure about, or simply don't know what on earth all those features are when looking at camera specifications. It is an attempt to un-confuse what can be incomprehensible to anyone, particularly those new to using anything past a simple "press the button" camera (or model!). Bear in mind that virtually everything on digital cameras started with film capture – and still work in much the same way. The major difference is that digital cameras do video as well.

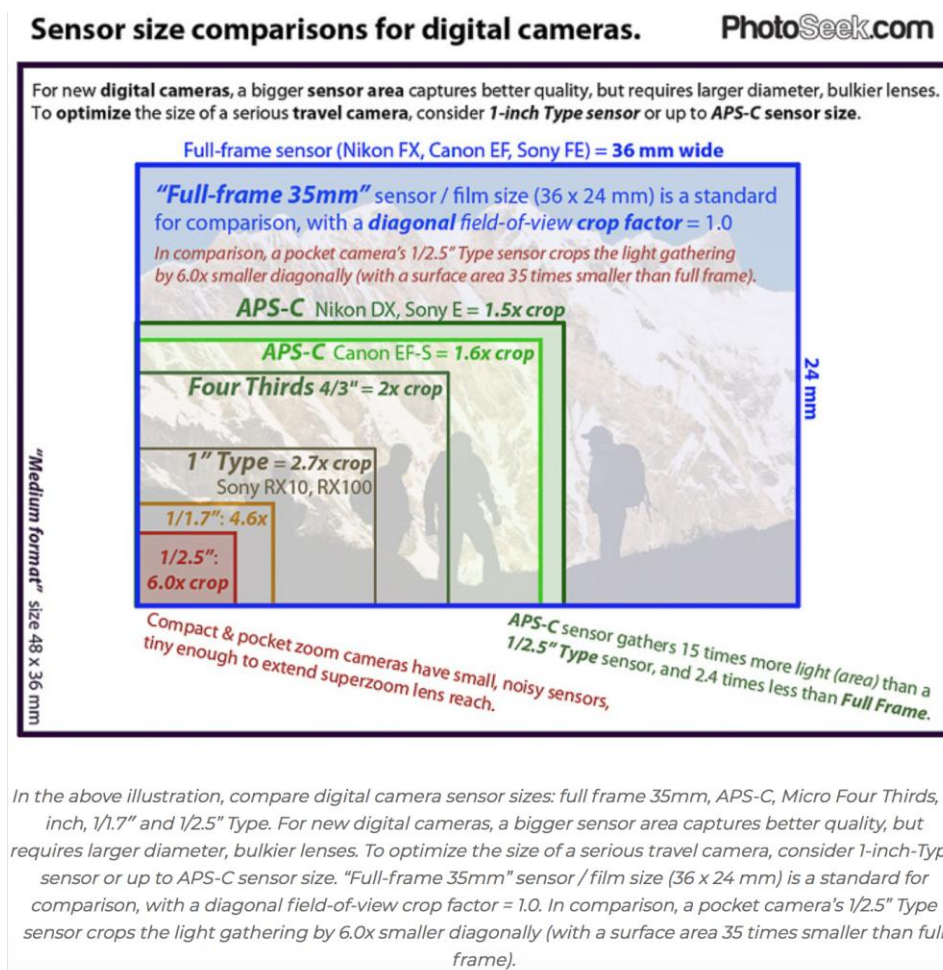
Megapixels:

This is simply the number of dots (pixels) on the sensor which capture your photograph. Each pixel is a tiny, light recording dot of electronic genius. It is sometimes also known as a photosite – same thing, different name. Pixel count can be different even if on the same size sensor, and just to add to the fun, pixels themselves can be of slightly different sizes. In simple terms a slightly lower number of larger pixel (but still extremely tiny) can be a better option than a lot more but smaller pixels when crammed onto a sensor – they produce less "noise" in a low light image. That, though, is for the terminally picky photographer; in action there is little difference in the results for the majority of photographic situations.

Most current cameras (current 2018) will offer around 18-24 megapixels. Smaller and/or older cameras will offer anything from 2 megapixels upwards, medium format (professional level) and some full frame cameras can offer 30 megapixels or more.

Sensor:

Sensors come in different sizes – and it is the size of the sensor that will make more difference to the finished image, not necessarily the number of pixels on it (although there is a trade-off eventually between smaller sensors with larger numbers of pixels).



Sensors are measured, like a TV Screen, corner to corner diagonally. The majority of pocket cameras will use the 1:2.3 sensor, which is physically about the size of a lady's little finger-nail! Some pocket cameras use the slightly larger 1:1.7 sensor, which can produce slightly better results than the 1:1.23 sensor. Most DSLRs use an APS sensor (there are slightly differing sizes between makes), many mirrorless use either 1-inch or micro 4/3 sensors. At the upper levels of DSLR are the "Full Frame" sensors, which are the same size of a frame of 35mm film. After that are the Medium Format cameras with a very large sensor which can contain a lot of pixels – currently up to 100 or so.

PASM:

This one is designed to confuse – it is an acronym for

Program
Aperature
Shutter
Manual

It is a description of the controls you can choose to use – and here, it is nearly 'the more the merrier' because it also covers a completely automatic point-and-shoot mode, another setting option (or more) for video capture, and often a completely customisable set up that you can use for a personal or specialised shooting option.

Program is a mainly automatic option but one that normally allows you to override the suggested setting if you wish – but only minimally.

Aperture is a semi-automatic option, you set your desired aperture, the program then sets the necessary shutter speed needed to cope with the aperture and ISO.

Shutter works the same way as the aperture option, only you set the shutter and the camera sets aperture as needed.

Manual is the option that requires your input on all fronts, the camera does what you tell it to do and does absolutely nothing for you.

In action there are variations on how these modes appear on the camera – you may have Av for aperture, or Tv for shutter, and some makes use a green square icon for the fully automatic option. However they are all referred to as PASM.

AF Points:

Once upon a time, long, long ago you focussed your camera manually. If you were lucky you had a device to help you – on the most expensive cameras – but usually it was a pure guesstimate the distance and set it then hope. You can still do this of course, but you have a lot more options to help you get it right. In the meantime, modern cameras have several different ways of focussing automatically, and offer multiple focus points – 45 being fairly average, although you can choose to have just one. It's a very clever tech item that does its best to help, but it can still choose the wrong bit of the subject to focus on. When its good its excellent, when it missed the point its irritating. Where it excels is when following a fast moving subject that would defy the nimblest fingers on a focussing-ring.

There are variations on a theme in this item – some cameras offer even more clever systems that utilise more than one pixel to focus – i.e. the camera is programmed to measure the difference between two (or more) pixels to set the focus correctly. Others use the difference between the contrast of parts of the image. This is an area where more is a LOT more and highly desirable.

FPS or Continuous Shooting:

This is the rate that the camera can capture individual frames. It is also known as "burst rate". Most cameras can capture frames at rates of 5 frames per second upwards – which is a very useful way of getting a fast moving subjects like sport, or flying aircraft. Faster frame rates appear on the more expensive models.

File type:

Virtually every camera will use JPEG capture – this is the smallest file type, and doesn't take up much room on your memory card. It is a file type that will slowly degrade if opened and closed – it loses information (lossy), so there are other options on less basic cameras. The commonest 'lossless' file is RAW – there are various versions of RAW according to the manufacturer's brand. It is the digital equivalent of a film negative and can be returned to many times to re-process the image (just remember to save the processed versions under different names!). The downside is that the image MUST be processed, where JPEGs can be used directly from the camera. RAW gives you more control the camera performs no processing internally as it does on JPEG.

Exposure/metering:

This is the tech that helps you get a photograph that 'looks right' in terms of how light or dark the image is. There are several variations on how the camera can advise you on the correct exposure to use – these usually appear on a list:-

- 1 Evaluative metering. This is where the camera looks at many parts of the subject and suggests the best possible shutter/aperture/ISO combination to use that will capture the majority of the subject correctly.
- 2 Partial metering. The camera looks at the lightest, darkest and mid tones in the subject and suggests a setting that will be correct as a 'best guess' to cover those areas.
- 3 Spot metering. The camera looks at a very small area of the subject – wherever you point the centre of the lens and suggest a correct setting for that area (only). It can, therefore leave light areas too light or dark areas too dark.
- 4 Centre weighted average. The camera looks at a slightly larger area in the middle of the subject, and compares other tones, and averages lightest and darkest tones whilst giving priority to the centre area.

Shutter speeds/Apertures/ISO/White Balance:

These are the figures you will be able to use to control your camera. Shutter/Aperture/ISO are 'the big three' that work together to give you the correct exposure – or allow you to deliberately alter it for an effect. That is a whole subject on its own. What is needed is a large number of options available in any or all of these items. Shutter controls the speed at which the light is allowed onto the sensor, Aperture controls the amount of light that falls on the sensor, ISO controls the sensitivity of the sensor to the light. Then there is the White Balance. White is not white! It can be a very pale shade of blue, yellow, green or pink – so pale that in practice the vast majority of people do not even notice that there is a colour cast – but the camera does notice, very strongly. So you are given the options to tell it to use a particular shade of white to get it right – or you can allow it to 'best guess' automatically. You can also choose to tell it to use the wrong white balance for a creative effect.

Colour space:

Adobe have developed a colour style to render in camera as closely as possible to what you see. This is referred to as Adobe RGB. There is a "lite" version known as sRGB. Most cameras will use sRGB, particularly the lower level products, but the higher specification cameras will offer the full Adobe RGB. sRGB simply uses about 30% fewer colours than Adobe RGB (in the colour gamut) but its still a matter of giving you millions of different shades and tones.

Video:

First there was film capture – you had to use a dedicated camera for still photographs and a different dedicated camera for movies, then spend a silly amount of time and money splicing the results together to make a film. Now we have digital capture and the cameras do both, very easily and in high quality – and while it is annoyingly technical, editing digital video is at least bloodless but not necessarily headache-free.

The vast majority of cameras will offer some kind of video capture, but there are variations here, and it is very fast developing area of technology. Video is normally shot at 72 pixels per inch – regardless of which definition is used.

Standard definition (SD) video is the now somewhat outdated 4:3 1024 x 768 size. We are so used to high definition videos that it no longer does much to excite the viewer and is being less and less used.

Full High Definition (FHD) is shot in widescreen 16:9 and in what are a higher and lower versions – either 1080 x 720 pixels or 1920 x 1080 pixels. This is the choice that is given on the majority of cameras, and now usually with a choice of frame rates.

4K or Ultra High Definition (UHD) is a bigger and better version of FHD, with a massive increase in the number of pixels used. It is usually shot at 16:9 widescreen format and on the long side uses 3800 to 4000 pixels (it does vary between camera makes). Currently there are a few manufacturers who offer 4K capture, but not every one does.

Coming to a camera near you soon.....8k capture..... in fact it is already here, but on very specialised video cameras, just not on your average over the counter kit. Yet.