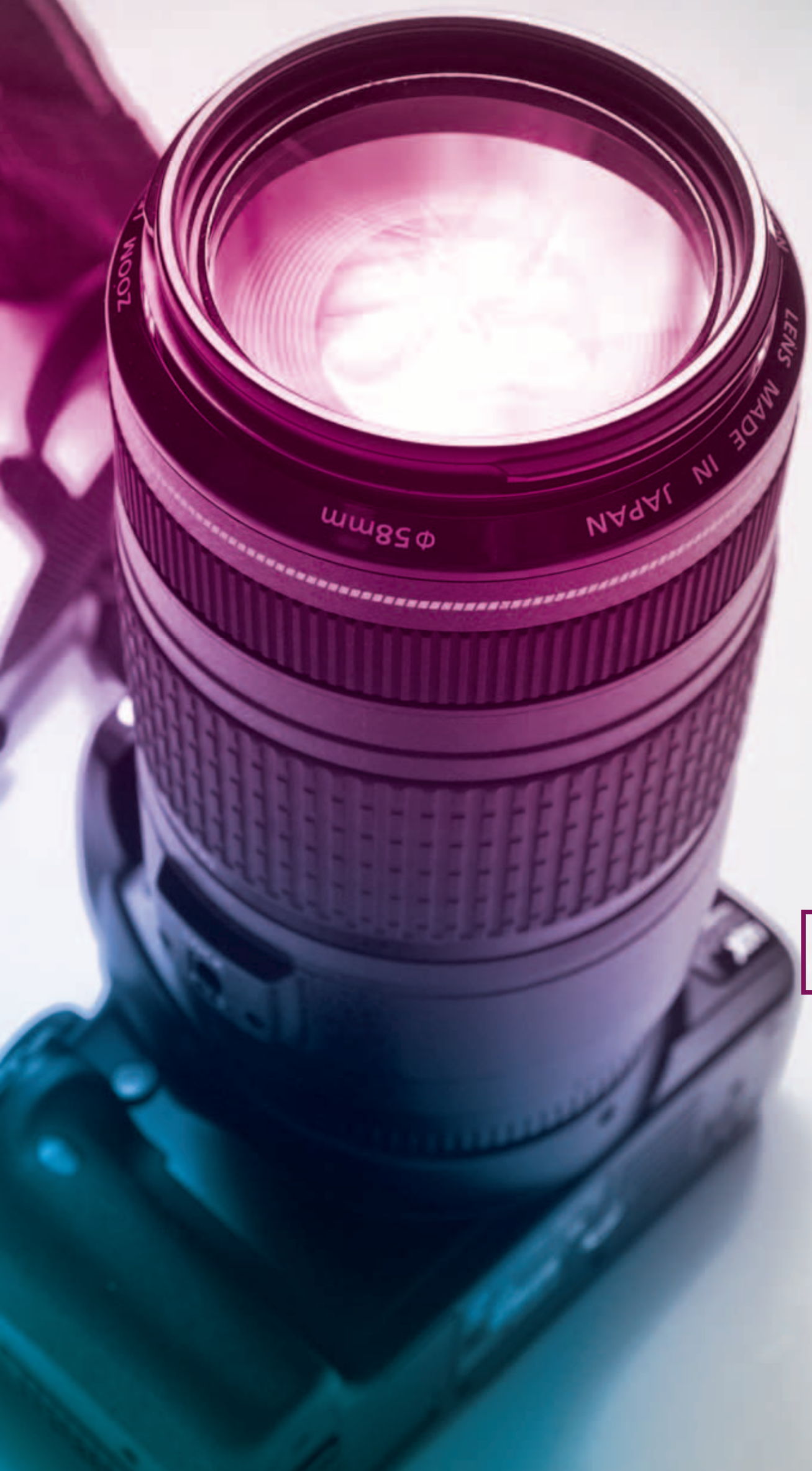
Beginners' Guide to

digital photography



Part 2: Exposure Tips

Aperture & Shutter Speed

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part two

All About Exposure

Exposure can be a difficult subject to get your head around initially, but with practice and perseverance it will become second nature. You'll find it can also be frustrating in its limitations, but an understanding of it will help you to improve your images and take greater control of the results achieved.

In photography, exposure is the total amount of light allowed to fall on the photographic medium, whether it be film or image sensor, when the shutter is pressed. It is considered "Correct" exposure when detail is present in both the highlight and the shadow areas of the image.

The amount of control you have over exposure depends upon which camera you own. Some cameras will allow you to control aperture and shutter speed separately using aperture and shutter priority modes, or you may be able to select a pre-programmed mode for various subjects such as landscape, portraiture, close-up or night photography.

All of these modes, although giving some control over your end result, will be exposed automatically using the camera's metering systems. Some cameras, such as SLRs, will allow the user to take complete control over the exposure settings. The amount of control over exposure varies greatly from camera to camera, so check your manual to learn more about how much control you have.

Correct exposure can be difficult to achieve in digital photography. The reason for this is, unlike film that can cope with up to 7 stops between the shadows and highlights without losing detail, digital sensors can only cope with 2 stops, which means if you are photographing a scene with extremes in the highlights and shadows, generally you can only capture detail in one or the other, but not in both.

Being aware of this can help reduce the frustration of digital photography. You can try avoiding these scenes altogether or frame your subject in order to reduce either the bright or dark elements. For instance you may be photographing a sunset with a bright sky and darkening landscape. The camera will either expose the sky correctly and the landscape as black or vice versa. By adjusting your camera so that your image frame includes mostly sunset with only a very small portion of landscape below, you end up with a nicely exposed sky whilst increasing drama in the image through slight silhouetting of select items along the skyline. Fill flash or the use of reflectors and filters are effective instruments that can be used to improve exposure in difficult conditions and we will discuss these further in part 3 of this series.

Four Top Tips

TIP 1:
Choose the most important element in your image and then adjust your camera angle or use the zoom to remove or reduce the opposite in either the highlights or shadows.

There are three factors that determine correct exposure. Firstly the **shutter speed** which is the time the shutter is allowed to remain open and admitting light. For example 1 second, 1/4 of a second, 1/60th of a second, 1/500th of a second. Obviously if the shutter speed is set to 1 second, then more light would be allowed in than if it was set to 1/500th of a second. The second factor is **aperture** which is the diameter of the opening that light is allowed to travel through. For example, f22 is a very small opening whereas f 1.4 is wide open. The third factor is **ISO** which we will discuss later, but at this point it's enough to know that it does effect exposure and adjusting the ISO can help you achieve greater control.

Many combinations of aperture and shutter speed produce equivalent exposure. By increasing the amount of light allowed to enter through shutter speed, the less light you'll need to allow through via the aperture. A wide aperture and fast shutter speed can achieve the same exposure as a narrow aperture and slow shutter speed. For instance f2 at 1/500th of a second is equivalent to f16 at 1/8th second.

TIP 2:
Try bracketing your exposure. This involves taking 3 separate images of the same scene. Firstly a photo at the correct exposure (according to your camera's metering system) then the second image is underexposed and the third image is overexposed. Some cameras allow you to select a setting that does this automatically every time you press the shutter.

The settings used to achieve correct exposure will differ with every subject and light source. For instance you can achieve correct exposure on your subject whilst the sun is behind a cloud, then find you're image is overexposed once the sun emerges. Built-in exposure meters give guidance as to the exposure settings required for any given situation but as I've mentioned, your exposure meter can be fooled by very bright or dark subjects. If you find that an image taken on automatic results in some overexposure, then note those original settings, flick to manual control and try adjusting to a faster shutter speed in order to reduce the amount of light falling on the image sensor, or alternatively, close the aperture down.

The limitations I mentioned earlier come when you discover the aperture/shutter speed 'trade-offs'. At a shutter speed of 1/200th second, the movement in your image is completely stopped, but the wide aperture necessary to compensate the quick shutter speed (ie f1.4) will result in limited depth of field. Similarly a shutter speed of 1/125th second at f5.6 is not adequate to freeze motion, but the depth of field has improved substantially. At a shutter speed of 1/15th of a second at f16, the depth of field ensures that all elements within the scene are sharp focus but any moving objects will be blurred. This is where ISO can come to the rescue. If you are faced with a situation where you want to stop action and require good depth of field, you can select a high speed ISO setting such as 800. In Digital Photography ISO measures the sensitivity of the image sensor. The same principles apply as in film photography – the lower the number (ISO 100) the less sensitive your camera is to light and the finer the grain. Higher ISO settings (ISO 800) are generally used in darker, low light, situations to achieve faster shutter speeds. Faster ISO can give you a couple of extra stops to work with however, be warned, the faster the ISO, the 'grainier' (or noisier as it's referred to in digital terms) the image.

Part 2: Exposure Tips

TIP 3:
Panning can help when photographing moving objects in low light. By moving your camera at the same speed as the subject as you depress the shutter release will result in most of your subject being captured in focus. This will also result in any motionless objects within your images being blurred.

One way to improve your chances for achieving correct exposure is to find an element within your image frame that represents mid-tones. Point your camera at it in order to obtain a reading. Many modern cameras have a feature known as Auto Exposure Lock (AE lock). This feature allows you to 'lock' in exposure readings once an initial reading has been made. If you don't "lock in" the exposure, the camera will re-calculate it, based on changes within the larger scene.

TIP 4:
When using AE lock or manual exposure controls outdoors, take a metre reading from a patch of green grass. You'll find green grass is generally a fairly reliable "mid-tone".

Whether you select shutter speed or aperture, as a priority, depends largely on what you're trying to achieve. The shutter speed allows you to take creative control over any movement in your image. If you are photographing a waterfall and want to achieve beautiful smoky soft blurring of the water, you'd select a slow shutter speed such as 1/2 a second or slower. If you're photographing a person caught in a rain storm and want to capture the stream of rain and the person frozen still, you'll select a very fast shutter such as 1/250 of a second or quicker. When using slow shutter speeds you'll ideally need a tripod or something to brace your camera against to eliminate camera shake.

Aperture controls become your priority when photographing a subject where depth of field is an important factor. By opening up the aperture, you reduce the depth of field. By closing it, you increase it. In close-up photography, in order to capture as much of your subject in sharp focus as possible, you'll close the aperture to a very small opening. In portraiture, to blur distracting backgrounds whist softening the features and bringing the subject out of the image, you can select a wider aperture. Fans of glossy magazines will notice that it's become quite a popular trend to use shallow depth of field, particularly in food photography.

The table below shows the main full "stops" of shutter speed and exposure. If you've been paying attention to your camera, you'll have noticed that your camera allows you to select other speeds and apertures between these. They are half and quarter stops. Use this table when working out which exposure stops will give you the results you need.

SHUTTER SPEED	APERTURE
Fastest Shutter Speed	Widest aperture
1/1000	f1.8
1/500	f2.8
1/250	f4
1/125	f5.6
1/60	f8
1/30	f11
1/15	f16
1/8	f22
1/4	f32
1/2	f45
1 Second	f64
Slowest Shutter Speed	Smallest aperture

Put Your Best Image Forward

Send us a photograph that you've taken where you've achieved good exposure in difficult situations – to photo@dailyexaminer.com.au. The best images will appear in the next instalment of Beginners' Guide to Digital Photography, published on Monday 28th February.

Prize for the best image each week will be a 7" Digital Photo Frame. All photographs appearing in the paper will win the photographer 50 free 6x4 prints in store at Harvey Norman Grafton. At the end of the course, the best image will win the photographer a Panasonic Digital SLR twin lens camera Kit (DMC-G10KTWIN) VALUED AT $900.00. **ALL PRIZES COURTESY OF HARVEY NORMAN.**

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