

Overview

This crib sheet is designed to give you a quick overview of photography to enable you to take better photographs. You don't need much understanding of your gear to greatly improve your control of the settings and influence the images which you can take.

These apply equally to the best camera gear and the most basic entry level camera gear. It also applies to phones, although they may have more limited controls that you have access to. That depends upon the make and age of your phone device.

There is something known as the exposure triangle for taking photographs. This allows correct exposure of an image by changing any or all three settings to get the perfect image. Basically it is controlling the ISO, the aperture (f-stop) and exposure time (shutter speed) in the image.

More in-depth analysis of the terms

ISO - this is the sensitivity of the digital sensor, though in past times, it was the sensitivity of the film media being used. With film media values like ASA 64, 100, 200, 400, 800 and 1000 were fairly common in some formats, such as 35mm film. In modern digital cameras it can be changed quickly to accommodate different lighting conditions. Lower values mean less sensitivity to light while higher values indicate more sensitivity to light. The main drawback of higher sensor sensitivity is image noise which comes as the erroneous firing of typically the red and green pixels. Most cameras should be okay below ISO 400 to 800. Excessive noise generally becomes problematic at around ISO 3200 and above. This is a guide only.

Aperture or f-stop - this is the size of the hole allowing light onto the sensor and is controlled by moving vanes inside the camera lens. A large hole allows more light in (large aperture, small f-stop number), but then has a much smaller depth of field. A smaller hole allows in much less light (small aperture, large f-stop number), but then has a greater depth of field. There is balance to be attained, based on what you wish to be in perfect focus and what you'd like to be blurred in your image. Generally for landscapes you need most of the image to be in focus, however, there are times when selective focus is required as an artistic choice in the image. In portraiture, you can go quite low at around f5.6 to f9, but for landscapes you should be aiming for f13 minimum to f18. At large f-stop values another phenomena occurs, that of diffraction which can reduce the image quality.

The f-stop changes dependant upon what lens is in use. A wide angle lens allows a lower f-stop to be used and a telephoto-zoom lens needs a much higher f-stop to achieve the same depth of field.

Depth of field explains the amount of the image in focus from front to back.

Exposure time or shutter speed - this is how long the shutter is left open to capture the image. Short exposures need the other two settings adjusting to allow enough light in, or the use of flash to attain good exposure and capture fast moving objects.

Longer exposures allow more light in, but then have the risk of movement in the image. This can be used to great effect with water, showing the flow of water. Also you have the issue of camera shake where your own movement during the exposure causes blurred images. This is where a tripod comes in handy to stabilise the camera and hold it steady. The general rule for reducing camera shake is to use an exposure time of one over the mm of the lens being used. So with a 22mm lens, you'd be looking at minimum of 1/25th of a second.

If your camera has an image stabiliser, you may be able to reduce that to around 1/10th of a second or longer and still get acceptable results. If you have shaky hands, then using double the mm value is safer. So your 22mm would be 44 and you'd use a 1/50th of a second. This is more important when shooting with a zoom lens, because small movements are magnified by the nature of their magnification and shallow field of view. So if shooting at 400mm, then using 1/800th of a second would be advised. This becomes difficult to achieve in low light and the restrictions of some lenses being limited to a minimum of around f8. This is where adjustment of the other settings is required for correct exposure. Many cameras have modes which assist you in this goal.

By using different camera modes it allows you some control over how the image will be taken. Tx or Tv mode allows you to set the shutter speed and it controls the aperture for the exposure which has been set by you. You can dial in extra EV or dial it out as required. This is ideal for moving objects such as birds and planes.

By using Av mode, it allows you to set the aperture or f-stop and the camera controls the shutter speed. This is more useful for landscapes, but does require you to understand when the shutter speed is too slow and image blur will become a problem. Use of a tripod is recommended to remove that issue for longer exposures.

Manual mode means that you have to control all of the items simultaneously, but gives you as the photographer greater control over your images. By reviewing images after each is taken this allows for adjustment and them to be retaken when they may be suspect. Reviewing images in the camera is important and the histogram helps here.

Reading the histogram

The histogram indicates how well or poorly exposed each image is. If you have a nice curve in the middle, then all is good. If the histogram is weighted to the bottom end (left) then it is generally under exposed. If it is clipped on the left border then it is significantly underexposed and needs to be retaken with different settings to improve exposure. Clipped shadows will remain black as the details were not captured. This is generally not as bad as overexposed highlights which are blown out.

If the histogram is towards the top (right) end then it is over exposed. If the histogram is clipped on the right border, then it is significantly burned out and the highlights will remain white and blown out even when adjusted. The image needs to be retaken with different settings, reducing overall exposure.

Where the histogram is showing as both under and over exposed, clipped at both ends, then this is where bracketed shooting is advised. Take an image exposed at 1-2 stops under, take another in the middle, and finally take an image 1-2 stops over exposed. The 3 images can be merged by using high dynamic range (HDR) software to pull the details out of the highlights and out of the shadows to give an all round better exposed image.

Some phones and most modern cameras have bracketing included with a HDR setting to allow for these conditions. It can make previously hard to get photographs look good by capturing more light (exposure). However, it can also be taken too far and flatten images too much, making them look really bad and false. There is balance to be had and personal choice is key to achieving a nicely balanced final image.

Checking focus

Another key item to check is that your image was in focus. Look at the image and zoom in to maximum and look at the critical part of the image; usually your subject.

If this is not sharp, then retake your image after refocusing your lens on the subject, or by changing other settings to improve depth of field.

Recommendations

Only use RAW camera settings, unless you really do not wish to do much post-editing. Always use the maximum resolution for images unless you only intend posting images to websites or social media platforms. Printing of images requires higher image resolutions (no. of pixels). Set quality to highest where possible, especially if using JPEGs. RAW files will generally be 50-60% larger than JPEGs when stored on your camera or phone. JPEGs compress files and lose both light and colour data which cannot be recovered later. This limits editing options, especially amending colour balance, so should be avoided where possible.

This applies to phones and cameras alike. Older phones will not allow the file to be saved as RAW, but some newer phones do or allow the full image data to be saved. This is known as lossless, whereas JPEGs use lossy formats for compression.

Always take spare batteries and memory cards with you. Keep them safe and dry. Take a dry lint cloth to clean the lens and remove any water droplets from the camera body and lens due to rain or close proximity to waterfalls. Check the lens often for any finger marks, dust or droplets. They can ruin images, spoiling a lot of hard effort.

When using a tripod, you can remove the camera shake of depressing the shutter by using a cable release or shutter remote. Alternatively you can use the 2 second timer. The timer works well with the bracketed shots, taking all 3 in the series for you. Otherwise you have to depress the shutter button 3 times to take all 3 images.

If you turn the camera off or change the battery, the camera often resets to single shot mode and needs to be put back into bracketed shooting mode.

There are lots of YouTube videos out there to go through the basics for your particular device, be that a camera or phone. Watching a few of them can help familiarise you with your device settings and how best to achieve certain shots. Do not fear experimentation, trialling out different things. Be aware of what you did at each stage to allow better evaluation as to what worked and what didn't.

It is a learning experience and if the initial images are not as expected, please do not give up if initially the results are not as expected. Go and try more photography, working out where you may have miscalculated and gotten the settings wrong. It happens to professionals as well, but they know the basics and just adjust their settings taking another shot. They review it and take more images as required.

Remember that there are only those 3 camera controls you need to consider, the ISO, the f-stop and the shutter speed. That is photography in a nutshell.

Framing the subject, using lines of thirds and being artistic are more personal and subjective. There are rules for what should work, but sometimes they can be broken or pushed to good effect. Again there are YouTube videos online to help with composition and particular styles of shooting.

Post-editing

While I don't know what editing software you use, there are some basic elements which can be found in the majority of image editing packages which can be tweaked to improve images.

These include:

Levels: it shows a histogram from 0 to 255. Generally, if the histogram is not all the way to both edges, then you can stretch the histogram so that it starts and ends at around 0 and 255. This gives better overall exposure within your image.

Exposure: this value can be tweaked, but be careful not to take the value too far.

Colour balance/white balance: these can be used to remove colour casts from within images. Please note that JPEG images with an incorrect colour balance will not fully correct, because some of the original image data was lost through the file compression used in JPEGs.

Clarity: adjusting this can make slightly soft images sharper and better looking.

Image crop and rotate: use the crop to remove items in the image which are distracting and adjust the horizontal if it wasn't perfectly level when taken. Change the overall shape of the image by selecting another recognised format.

Remove haze: also helps with contrast and the blue haze often associated with distance.

Highlights and shadows: both of these sliders can be tweaked to adjust the lighter areas or the darker areas of your images to reveal more detail. Images that were clipped cannot be recovered and the clipped areas will remain either black or white.

Just remember not to overwrite your original files so that you may work on them again, should you not be happy with the results from the initial editing.

Merging bracketed images and creating high dynamic range images requires additional software, unless it is included with your image editing software. There are free versions and others which require payments to use. I can recommend EasyHDR for trialling of the technique. It is relatively easy to use and shows what can be achieved. Other software is more complicated in use but can achieve greater results.

Creating panoramas requires specialist software to composite images into one larger image. Microsoft ICE is free and can do a good job, but at times gets it wrong. Even Photoshop can get image merging incorrect, so there is often some trial and error in working with stitched images. Some tweaks may be required to remove the obvious mismatched parts and failed joins. This is especially true with water and clouds which move between shots.

Explore, take photos and make good memories.