EXPOSURE – PRACTICAL EXERCISES

John Taylor

These practical exercises are a way of learning the principles of Exposure. See the article on Exposure for further explanation.

EXPOSURE MODE SET TO MANUAL

- Set your camera on Manual mode. Choose a high contrast scene (strong sunlight and shadows) to photograph. I recommend you have the camera on a tripod, so the shots taken in this exercise are identically framed.
- Half-press the shutter button to activate the camera's exposure meter. Vary the aperture and/or exposure time to balance the meter in the centre, and take a shot.
- Repeat this, but with setting the needle ONE STOP to the left of the centre by changing the shutter. (One stop is usually 3 clicks of the shutter or aperture dial, or 2 clicks if the dial has been set to change in ½ stop increments.) Is this image lighter or darker than the first image? Check the exposure times of the 2 images. The darker image will have twice the exposure time.
- Repeat, but balancing the needle one stop to the right. Which of the 3 images looks best on your camera's LCD monitor? Compare the histograms.
- Take 2 more images, but keep the shutter the same as the first exposure and change the aperture by one stop of over and under exposure. The darker image will have an aperture hole that is double the AREA of the correctly exposed image.
- Compare the 5 images you now have on the camera's LCD screen. Do the 2 over exposed images (and the 2 under exposed images) look identical?
- Look at the 5 images using your preferred editing software on your computer. Which looks best? Can you use your software to correct the under and over exposed images (checking highlight and shadow detail)? HINT: in Lightroom or Adobe Camera Raw, change the exposure slider by exactly one stop. Compare the colours of the corrected over and under exposed images. What happened? Which is the best exposure?
- Repeat this exercise with 3 or more stops of over and under exposure. Can you correct the exposure of these images using your software?

Learnings?

> Unit of exposure is One stop (or EV), equivalent to halving or doubling the exposure time.
> Increasing the exposure lightens the image and reducing it darkens it.
> A 1 stop step in exposure time is exactly equivalent to a 1 stop step in aperture value

EXPOSURE MODE IS SET TO APERTURE PRIORITY (A OR AV).

NOTE: THE APERTURE IS A CIRCULAR HOLE IN THE LENS THAT IS VARIED IN SIZE TO ADJUST THE AMOUNT OF LIGHT GETTING TO THE SENSOR.

- Doubling the *area* of the aperture doubles the light reaching the sensor: 1 stop or 1 EV.
- The exposure is also dependent on the aperture to sensor distance, which is nearly always the same as the lens focal length. Doubling this distance reduces the light by ¼, or 2 stops or EV units.
- Aperture units are expressed in f/numbers, which takes both these effects into account. Aperture f/8 has the same light level on the sensor whatever the lens focal length. Isn't that great!

- Each step up the standard aperture series below halves the amount of light reaching the sensor

Largest f/2   f/2.8   f/4   f/5.6   f/8   f/11   f/16   Smallest

EXERCISE

- Set to aperture priority and take 3 images of an outdoor scene with ISO at its lowest setting, one at Maximum aperture, one at f/8 and the third at minimum aperture (f/22 or f/32).
- Look what happens to exposure time as you change the aperture.
- Which one has the most blurred background? Which has the deepest depth of focus?
- Which of the images is blurred by camera shake?
- Are any of the images noticeably sharper at the in-focus part than the others?

EXPOSURE MODE IS SET TO SHUTTER PRIORITY (S OR TV)

It is a good mode to use to control subject movement or camera shake causing unsharpness in tricky lighting situations. Do this exercise with the Image Stabilizer off. Then repeat with it on.

EXERCISE

- Zoom to the maximum focal length of your lens. What is the focal length in millimetres (f).
- Set the shutter time to 1/f.
- With the camera set at this shutter value, and standing as still as you can on both feet, take 3 shots.
- Examine on your camera's LCD screen at high magnification. Are they sharp? Look again on your computer at home.
- If not, repeat at 1 stop shorter exposure time. Repeat if necessary. If OK lengthen exposure.
- Repeat in other positions, laying on tummy, kneeling, with your back against something solid.

ISO SETTING ADJUSTMENTS

This affects the Sensitivity of the sensor, and is effectively an amplifier of the electronic signal. A low setting gives the best sharpest images, but requires more light (longer exposure time or larger aperture) to give correct exposure. A higher setting allows less exposure to give a correctly exposed image (not too light or too dark), so is used in dimmer light, but there are 2 consequences with high ISO:-

- The image is noisy – has unwanted grainy effects, destroying fine detail. There may be spots of irregular colours (Colour noise).
- There is less dynamic range, which means the camera cannot cover high contrast subjects. The highlights are too bright lacking detail, or more likely the shadows are black areas with no detail

Exercises:

- What is the easiest way to change the ISO setting on your camera?
- Take two photographs of a scene with strongly sunlit and shady areas, one at ISO 100 and the other at ISO 1600 or higher. Compare the images in your image editing software. Is there any difference between the images? Use your image editing software to remove the noise in the high ISO image. Compare them again, particularly the amount of detail in the shadows.
- Take a series of photos at increasing ISO. Develop them (including noise reduction) using your favourite application (mine is Lightroom). What is the highest ISO you can get a good full size photo with no noticeable noise?