

04 week

GETTING THE RIGHT EXPOSURE

A precise amount of light needs to reach the camera's sensor to make a successful photo. This amount is known as the correct exposure. Too much light, and your photograph will be overexposed; too little light, and the photos will be underexposed.

In this module, you will:

- ▶ **test what you know** about a photo's exposure;
- ▶ **find out how you can control exposure** and how your camera meter works;
- ▶ **apply your knowledge** and make the right exposure choices during a step-by-step photoshoot;
- ▶ **develop your exposure skills** and experiment with different ways to create some dramatic effects;
- ▶ **review your shots** to see if your exposure settings have been successful;
- ▶ **improve your photos** by reducing image noise;
- ▶ **recap what you've learned** about exposure and see if you're ready to move on.

Let's begin...





▶ TEST YOUR KNOWLEDGE

Assessing exposure



A photo may be correctly exposed, dark due to underexposure, or even light due to overexposure. These photos display different levels of exposure. Can you match the characteristics to the right images?

A Normal subject, correctly exposed: This allows for detail in the brightest and darkest areas.

B Underexposed: There will be little or no detail in the darkest areas of the photo, and even the highlight areas will look muddy.

C Dark subject, correctly exposed: The exposure of a dark subject should reflect that the subject is dark. Any light areas should be correctly exposed.

D Light subject, correctly exposed: The exposure of a light subject should show that the subject is light.

E Low-key: The scene has mainly dark tones, with few light areas.

F Overexposed: There will be little or no detail in the light areas of the photo, while shadow areas will look pale and washed out.

G High-key: The scene has mainly light tones, with few dark areas.

ANSWERS

- D/7: Snowy forest scene
- E/1: Photo of a man in darkness
- F/2: Young woman shopping
- G/5: Spring blossoms

- A/3: Mountain reflected in water,
- southern Germany
- B/6: The last rays of the sun
- C/4: Close-up photo of a black cat



NEED TO KNOW

- Exposure is the art of judging how much or how little light is necessary to make a successful image.
- There are many different ways to expose a photo. Taking control of exposure will expand your creative options when shooting.
- Experimenting with exposure is highly recommended. Don't be afraid to alter exposure for effect.

- Shooting under different lighting conditions will help you to see the effect this has on your exposure.
- Low- and high-key exposure are intentional methods of lighting a scene for effect, and not just the result of under- or overexposure.



Review these points and see how they relate to the photos shown here



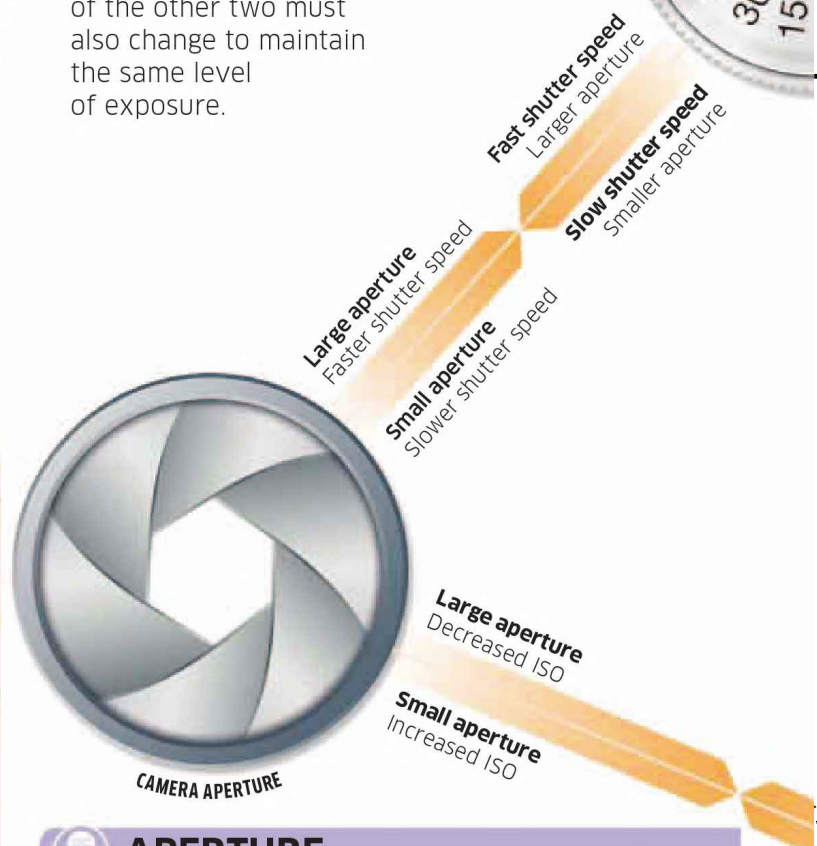
▶ UNDERSTAND THE THEORY

Controlling exposure

There are two physical controls on a camera that allow you to determine how much light reaches the sensor. The first control is a variable iris in the lens known as the aperture. By controlling the size of the aperture, you can choose how much light passes through the lens into the camera. The second control is the camera's shutter, which is a light-tight curtain positioned directly in front of the sensor. The shutter can be opened for precise periods of time before closing again, and this period of time is known as the shutter speed.

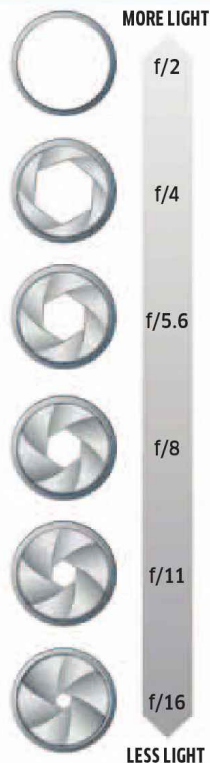
The exposure triangle

Aperture, shutter speed, and ISO are linked. Adjust one control, and at least one of the other two must also change to maintain the same level of exposure.



APERTURE AND f-STOPS

The size of the aperture can be adjusted in a set series of sizes known as f-stops. Lenses vary in the range of available f-stops. A typical range on a lens is f/2.8-f/4-f/5.6-f/8-f/11-f/16. Each f-stop in this range represents a halving of the amount of light reaching the camera's sensor compared to the value above—or a doubling of the light compared to the f-stop value below.



APERTURE



The largest (or maximum) aperture lets in the most light. In low light it allows a faster shutter speed.

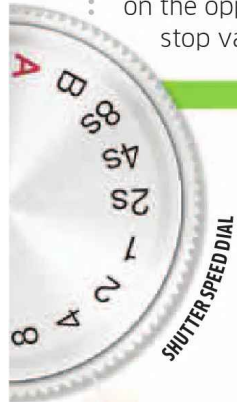


A mid-range aperture is suitable for normal levels of light and allows a standard shutter speed to be used.



The smallest (or minimum) aperture lets in the least light. In bright light it allows a slower shutter speed.

Pro tip: Cameras usually allow you to alter the aperture, shutter speed, or ISO by half- or even one-third stops. In the sequence of aperture values on the opposite page, f/4.5 and f/5 are the one-third stop values between f/4 and f/5.6.



SHUTTER SPEED DIAL

SHUTTER SPEED

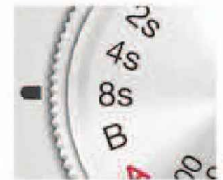
Cameras differ in the range of available shutter speeds. A typical range starts at 30 sec and ends at 1/4000 sec. As with aperture, the difference between adjacent shutter speeds is known as a stop. Each stop represents a halving of the light reaching the sensor as the shutter speed is made faster (the shutter is open for less time), or a doubling of the amount of light as the shutter speed is made slower (the shutter is open longer).



The fastest shutter speed is used to freeze movement or when shooting in light that is very bright.



A mid-range shutter speed is suitable for normal levels of light and for general shooting purposes.



The slowest shutter speed is used to blur movement or when shooting in very low light.

Fast shutter speed
Increased ISO

Slow shutter speed
Decreased ISO

High ISO setting
Faster shutter speed

Low ISO setting
Slower shutter speed
Larger aperture

High ISO setting
Smaller aperture



ISO

Changing ISO affects the light sensitivity of a camera's sensor. It stands for International Organization for Standardization, which sets standards for camera sensitivity. ISO determines how much light is needed during an exposure; with a higher ISO, less light is required for a photo. Like aperture and shutter speed, ISO is also adjusted in stops, so an ISO setting of 200 makes the sensor twice as sensitive to light as ISO 100.



Auto ISO dynamically alters the ISO setting automatically according to light levels.



A high ISO is necessary if you want to use a faster shutter speed or smaller aperture in low light.



A low ISO is typically used in normal shooting conditions and allows for a wide range of aperture and shutter speed settings.



► UNDERSTAND THE THEORY

The exposure meter

Achieving the right exposure would be easy if light levels were constant. However, shooting in low ambient light requires a different mix of shutter speed, aperture, and ISO than shooting in bright light. Fortunately, cameras have a built-in light meter that measures light levels; this helps you to decide what exposure settings are necessary. The meter in your camera is known as a reflective meter because it measures the amount of light reflected by the scene in front of the camera.

i AVERAGE REFLECTIVITY

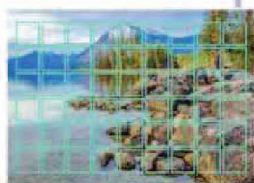
A scene that reflects 18 percent of the light that falls on it has an average reflectivity. Mid-grays and colors of a similar brightness are averagely reflective and are known as midtones. Camera metering is inaccurate with scenes that aren't averagely reflective: higher-than-average reflectivity causes underexposure; lower-than-average reflectivity causes overexposure. Judge a scene first to avoid errors.

**18%
GRAY**



METERING MODES

Evaluative (or Matrix) metering is the default metering option. It divides the scene into a number of zones, with each zone metered independently and the results combined to produce the final exposure settings. Useful when shooting landscapes with filters.



Good for general shooting purposes

Center-weighted metering biases the metering to approximately 60–80 percent of the central area of a scene; the edges are metered too, but this affects exposure less than the central zone. Use for the correct exposure of centrally placed subjects.

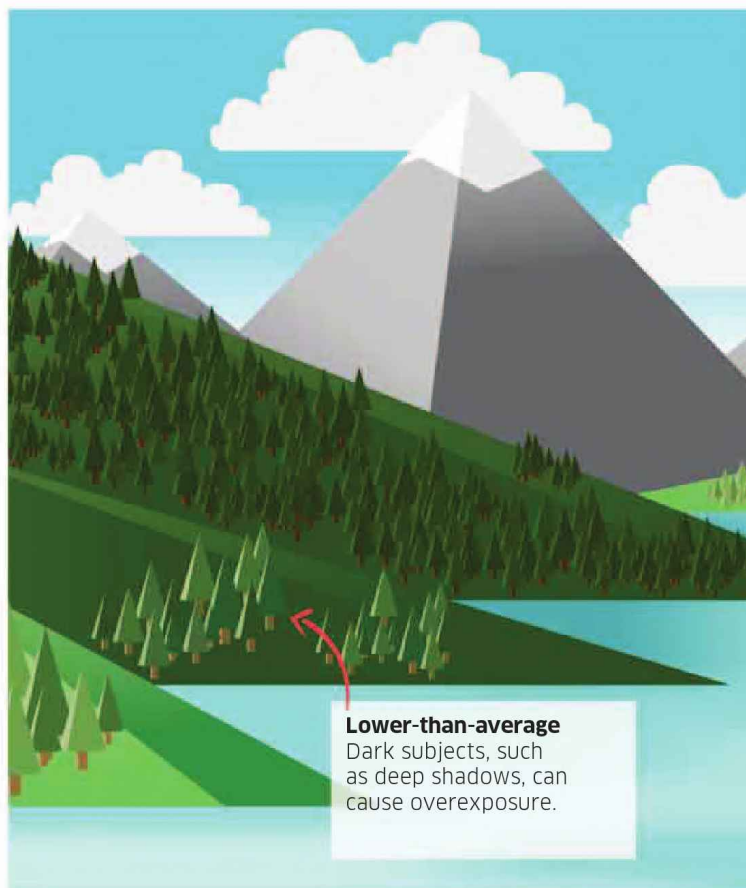


Good for portraits

Spot metering restricts the metering to approximately 1–5 percent of a scene (a variant is partial metering, which measures 10–15 percent of a scene). Metering is at the center of a scene, though some cameras let you lock metering to an autofocus point.



Works for a small part of a scene only

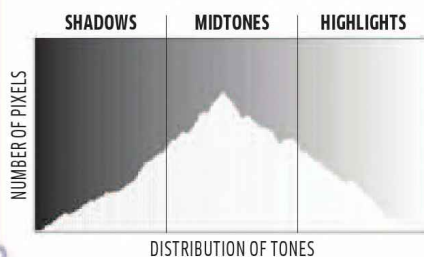


Pro tip: A useful highlight warning function during Playback is known as blinkies. This is a flashing indicator that shows areas of overexposure in a photo. If a photo suffers from blinkies, apply negative exposure compensation and reshoot.

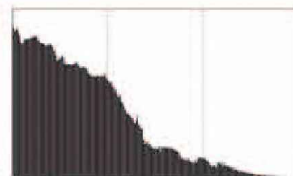


HISTOGRAMS

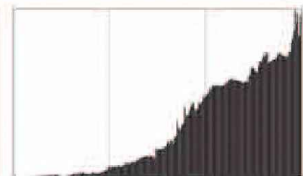
A histogram is a graph showing the brightness range in a photo. Black is at the far left edge, white at the far right edge, and midtones are measured at the center.



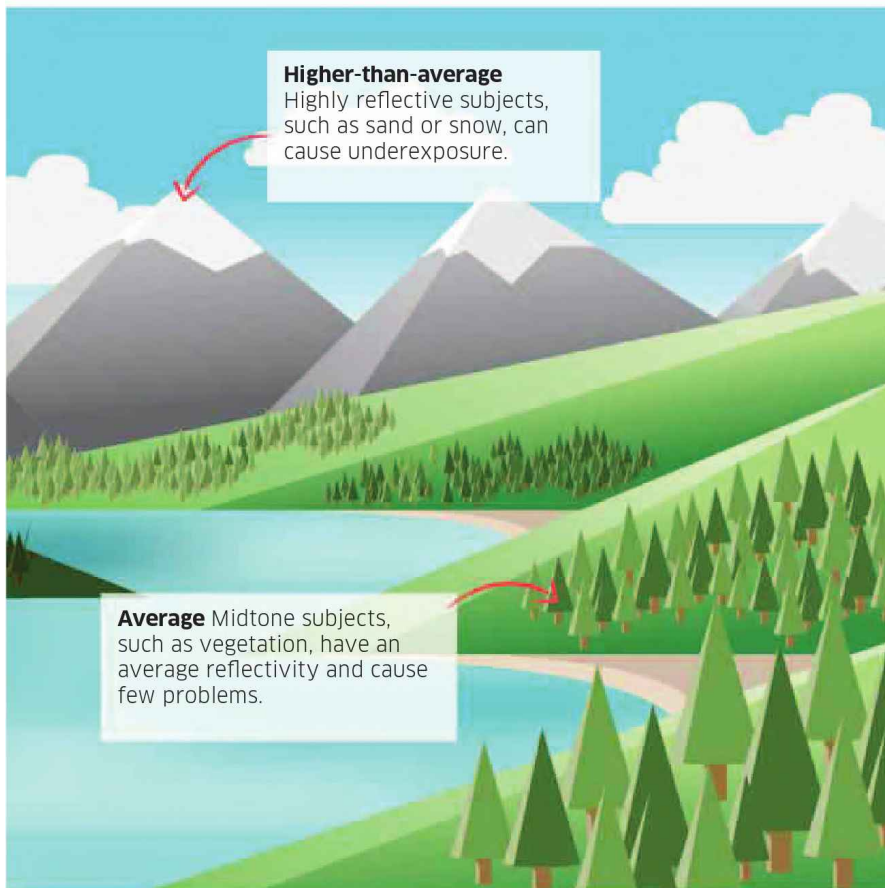
Correct exposure There is no ideal shape for a histogram. However, an averagely reflective scene would produce a more centrally placed histogram that isn't lost, or clipped, at either end.



Underexposure When a histogram is skewed to the left edge, the photo is potentially underexposed. This shows that the photo is mainly composed of dark tones.



Overexposure If a histogram is skewed to the right, then the photo is potentially overexposed. This shows that the photo is mainly composed of light tones.



EXPOSURE FIXES

As good as modern camera meters are, they are not infallible and can make mistakes. Exposure compensation is a function that allows you to adjust exposure. This can be used when a camera gets the exposure wrong, or for creative effect.

Positive or negative compensation

A typical exposure compensation range is plus or minus 3 stops. Exposure compensation is usually set either by adjusting a dial on the body of the camera or via a menu option. Positive (+) compensation is used to lighten a photo to correct for camera underexposure. Negative (-) compensation is used to darken a photo to correct overexposure.



The maximum negative compensation value is -3 stops



The maximum positive compensation value is +3 stops



▶ LEARN THE SKILLS

Fine-tuning exposure



While camera meters are usually accurate, they can get things wrong. Taking control of the exposure will let you correct errors and adjust the exposure for creative effect.

Sunny, cloud-free days will create strong, dark shadows.



1 Watch the weather

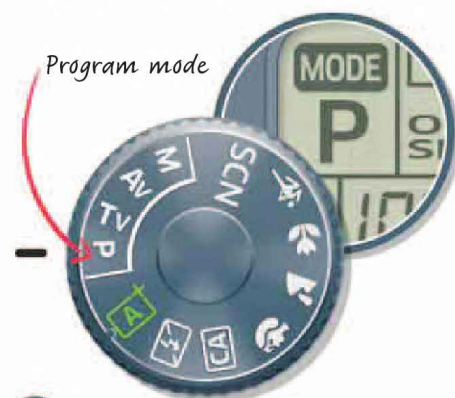
Shooting when the sky is completely cloud-free is less than ideal for outdoor photography. Instead, try shooting when the sky is partly cloudy.

Cloudy days will produce even light with few strong shadows.



2 Use Program mode

Set your camera to Program (P) mode to fine-tune exposure. The camera will initially select the required shutter speed and aperture; you can alter these by using Program shift or by applying exposure compensation.



6 Adjust exposure compensation

If the histogram shows that the highlights are clipped, apply negative compensation to make the image darker. If the shadows are clipped, apply positive compensation and assess the histogram again.



Exposure compensation is set via either a dial or a menu screen



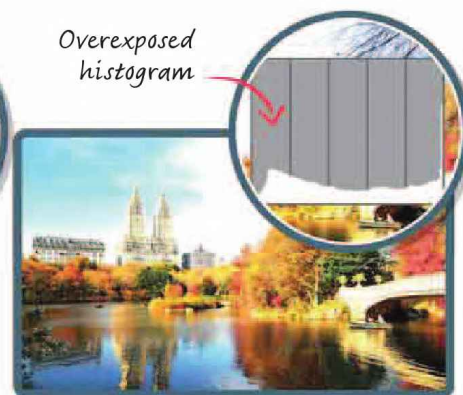
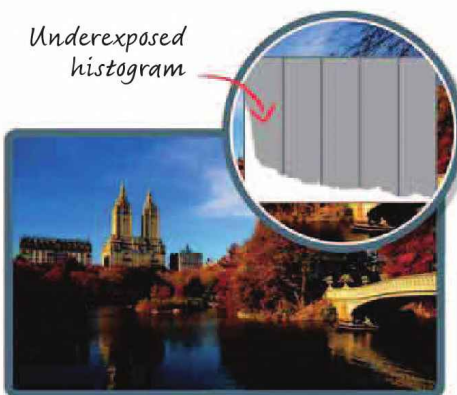
7 Take a shot

Press halfway down on the shutter button to focus and to make a final exposure reading. Take the shot when you are happy that the focus and exposure are correct for the effect you want.



8 Check your shot

Look at the shot in Playback and check the histogram. If necessary, adjust exposure compensation again and reshoot.



Where to start: Find a location with even lighting and without strong shadows or very bright areas. Shoot a correctly exposed scene using your camera's exposure tools.

You will learn: How to use your camera's histogram to assess exposure, and how to use exposure compensation to adjust it, if necessary.

3 Select Evaluative metering

Program mode will let you select the metering mode. Opt for Evaluative metering—while not 100 percent accurate every time, it's a good all-purpose choice.

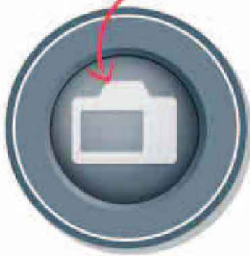
The symbol for Evaluative (Matrix) metering may look like this



4 Use Live View

Switch to the Live View display, which will make it easier to see the effects of adjusting the exposure. You may need to set the Live View display to simulate exposure by using the camera's menu system.

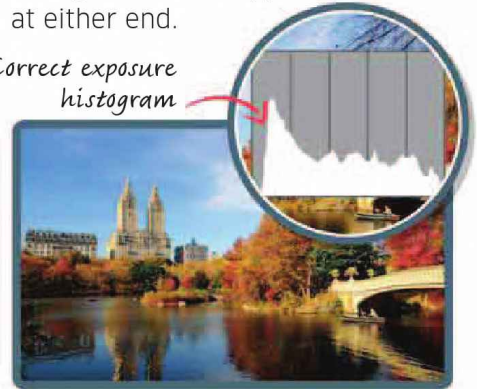
The Live View button may look like this



5 Live View histogram

Check the histogram displayed in Live View, if possible, so that you can assess exposure before shooting. Remember, there is no right or wrong histogram shape. However, make sure the histogram is not clipped at either end.

Correct exposure histogram



WHAT HAVE YOU LEARNED?

- Selecting Program mode will give you control over the exposure levels, allowing you to adjust the image before you take the photo.
- Using a histogram—in Live View or after shooting—is a far more accurate way of assessing exposure.
- Exposure compensation is a simple method of adjusting exposure before you shoot.



Good range of tones

Detail visible in both the shadows and the highlights



▶ PRACTICE AND EXPERIMENT

Exploring exposure

Digital photography makes it easy to experiment with exposure and see the results instantly. The key is not to worry if things go wrong; making mistakes is often the best way to learn. For these assignments, leave your camera in Program mode so that you can alter functions such as exposure compensation.



CREATIVE EXPOSURE

EASY

1 HOUR

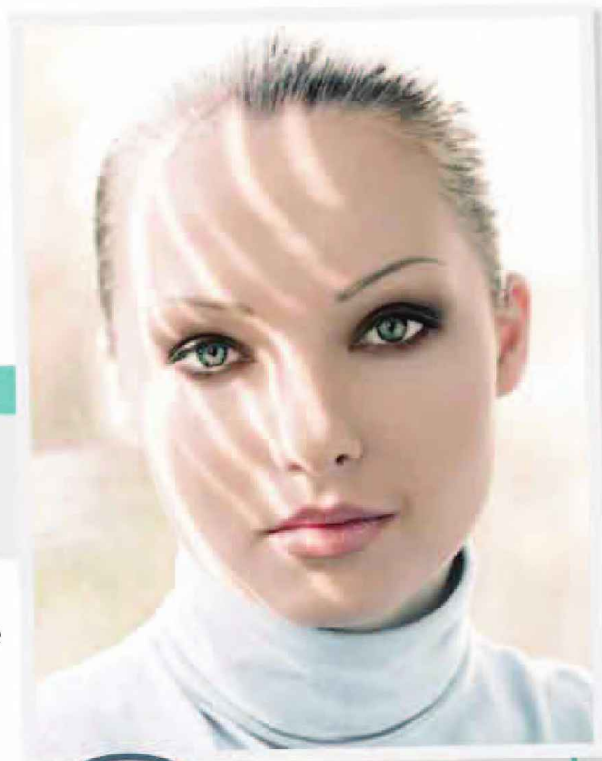
BASIC + tripod

INDOORS OR OUTDOORS

A MODEL

You can change your camera's exposure setting to alter the mood of a photo. Underexposing a photo will make it feel more somber. Overexposing will make a photo look and feel lighter.

- **Mount** your camera on a tripod.
- **Shoot** the scene at the exposure suggested by the camera.
- **Set** exposure compensation to -1 and reshoot.
- **Take** a shot at +1 exposure compensation, and compare the shots.
- **Experiment** using lower negative and higher positive exposure compensation values.



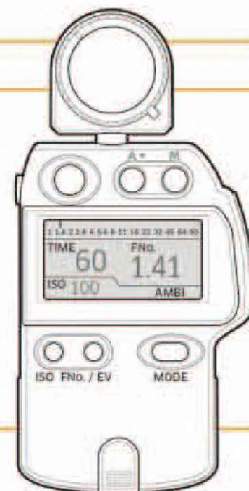
If skin highlights burn out, adjust the exposure compensation.



GEAR: HANDHELD LIGHT METER

Handheld light meters work in a different way than the meter in your camera. A handheld meter measures the light that falls onto a scene: this means that a handheld meter is not affected by the reflectivity of a scene. A handheld meter is therefore more accurate than the meter in a camera.

The exposure readings from a handheld meter must be set on your camera using manual exposure, which is a slow process. For this reason, handheld meters are more suited to landscape photography or working in a studio, and not for action shots.



Pro tip: Remember that exposure compensation should be reset to 0 when you finish shooting. Unless it is reset, all your subsequent photos will be incorrectly exposed.

Pro tip: You need to press the shutter button for each shot in a bracketed sequence. Combine bracketing with self-timer and the camera will shoot the entire sequence automatically.



USING SPOT METERING

MEDIUM

INDOORS OR OUTDOORS

30 MINUTES

A WELL-LIT SCENE

BASIC + camera with Spot metering function

Spot metering allows you to precisely meter from specific areas of a scene. It is most useful when you need to meter from a midtone area.

- **Set** the metering mode to Spot metering. Not all cameras feature a Spot metering mode; some have Partial metering, which is similar to Spot metering—if necessary, use this instead.
- **Find** an area of midtone in the scene and Spot meter from there. Grass and rocks are natural features that exhibit midtones.
- **Lock** the exposure and recompose if necessary.
- **Spot meter** from the brightest area of the scene and reshoot. Do the same after metering from the darkest area of the scene. Compare the exposure of all three shots.



Sunlit parts of the chairs, as well as the grass and sky, are good midtone areas for Spot metering



A BRACKETED SEQUENCE

MEDIUM

INDOORS OR OUTDOORS

30 MINUTES

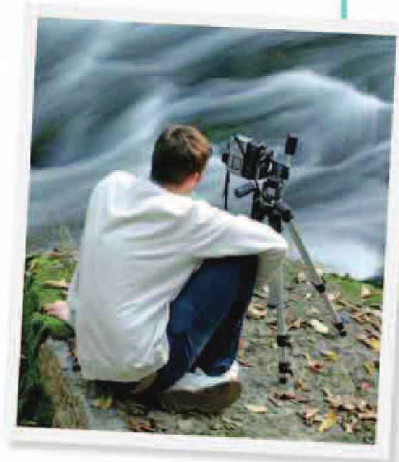
A WELL-LIT SCENE

BASIC + tripod

Bracketing, which is the practice of taking shots that are slightly underexposed and slightly overexposed from the correct exposure, can be a useful safety net, particularly if you're not quite sure what the exposure should be. Many cameras offer auto exposure bracketing, and will typically shoot three photos at different exposure settings: at the correct exposure, underexposed, and overexposed.

- **Mount** your camera on a tripod and select auto exposure bracketing.
- **Adjust** the range of exposures so that there is the maximum difference between the under- and overexposed photos.

Bracketing lets you play with different exposure effects, such as long shutter speeds.



WHAT HAVE YOU LEARNED?

- You don't have to stick to the exposure chosen by your camera. It can be varied for effect.
- Where you Spot meter from will affect the exposure for that specific area.
- Bracketing gives you more options for photo editing—at the expense of memory card space.



▶ ASSESS YOUR RESULTS

Reviewing your shots

After you've spent a week experimenting with exposure, look through the results. Pick out your best shots—showing, for example, when you used exposure creatively or when you solved a tricky problem. Use this checklist to assess what worked and where you could improve.



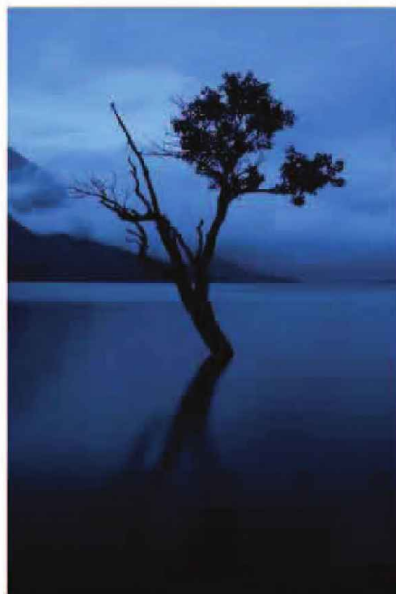
Is your image sharp?

Camera shake is caused by a camera moving during the exposure. You could increase ISO and shutter speed to avoid camera shake or, like this shot, use a long shutter speed to exaggerate movement.



Is your image underexposed?

Underexposure can be corrected in post-production, but this will greatly reduce image quality. It would be difficult to correct this shot without a loss in image quality.



Are your shadows too dark?

You may prefer your shadows to be dark for aesthetic reasons. This shot may look underexposed, but the effect is dramatic.



Is your image overexposed?

There is less image quality loss when correcting an overexposed photo in post-production. This shot is overexposed but, because the highlights have not burned out, it could be adjusted.



Pro tip: High-key photos are created by adding more light—such as from a flash—into the shadows to even out the exposure. Overexposure can be used to create a similar effect.

Pro tip: Low-key photos are created by restricting the amount of light falling onto a scene—usually by controlling where light does and does not fall. Underexposure can be used to mimic this effect.



Are your highlights burned out?

You usually set exposure so that the brightest parts of the image are not burned out. Some subjects make this impossible to avoid, but in some cases it can have a positive effect.



Did you spot meter from the right place?

This stone road is almost all midtone and would make a good subject for accurate selective Spot metering.



Where are the midtones?

In this scene, the ideal midtone is the lit headboard. Spot metering from this point would produce ideal exposure.



Is part of your image exposed incorrectly?

A camera can't record the full range of brightness in a high-contrast scene such as this one, so there is a compromise between loss of detail in the shadows or the highlights.



▶ ENHANCE YOUR IMAGES

Reducing noise



Noise is a random pattern of variations of brightness or color in a photo. The penalty for increasing the ISO setting is a marked increase in the visibility of image noise. Fortunately, this can be reduced in post-production. The key is to not apply too much noise reduction, since this can remove fine detail. It can also cause a photo to look artificially smooth and lacking in texture.



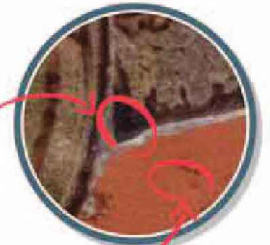
Shot at ISO 6400, this photo suffers from image noise when viewed close up.



1 Assess your photo

Not all photos need noise reduction applied. View your photo at 100 percent to see whether noise is a problem. Pay particular attention to areas of even tone, such as sky, and to the darkest areas of the photo.

Noise is found in shadows and areas of dark tones



Noise can also be seen in areas of flat tone



4 Set Preserve Details

Drag the Preserve Details slider to recover any fine detail that may have been lost by using the Strength slider. Stop when noise starts to reappear. Preserve Details is adjusted as a percentage.

See texture return as you drag the slider



Preserve Details: 37 %



5 Reduce Color Noise

Color noise is seen as blotches of random color, usually only when a very high ISO setting has been used. Slowly drag the slider until the natural colors of your subject show through.

The photo is relatively free of color, so only a low value is needed



Reduce Color Noise: 12 %



6 Set Sharpen Details

Applying noise reduction can slightly soften an image. Use this third slider to add sharpness back into your photo. Do not sharpen an image if you plan to resize it later.



Sharpen Details: 0 %

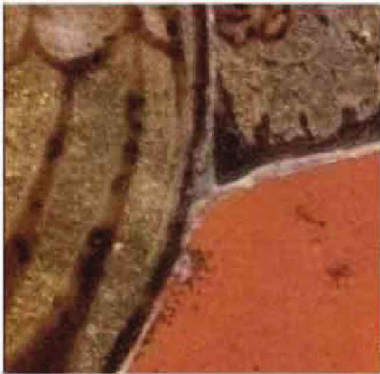
“ A photograph is the pause button on life. ”

TY HOLLAND



2 Use the Reduce Noise filter

Select the Reduce Noise filter and vary the amount of correction applied. Typically, the higher the ISO value you selected at the time of shooting, the more extreme your post-production correction will need to be.

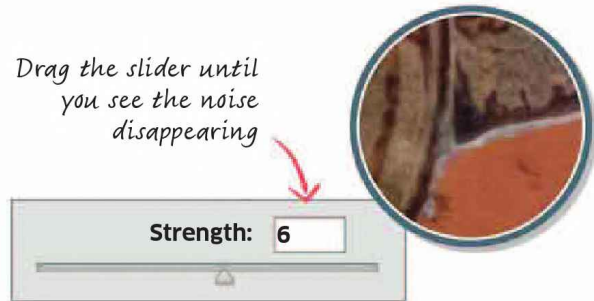


Select Preview to see the changes to your photo

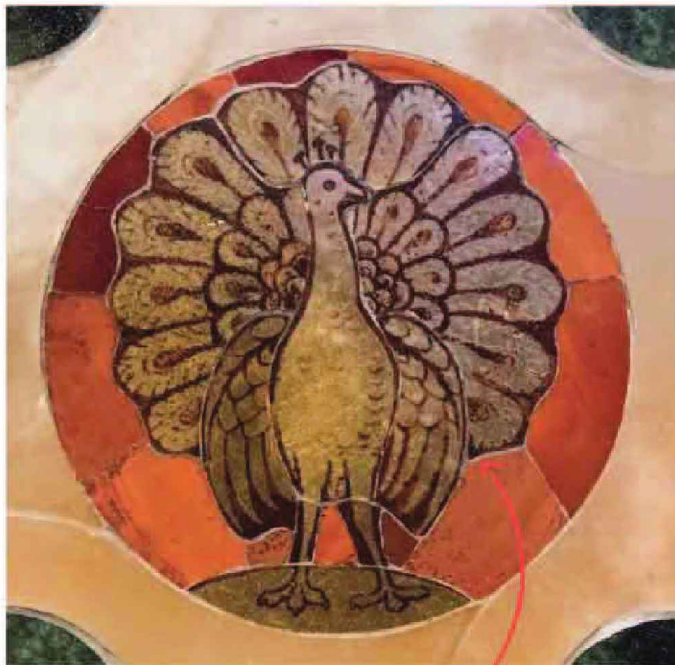


3 Select the strength of noise reduction

Adjust the Strength slider to tackle the luminance noise. Luminance noise adds a gritty texture to a photo, caused by small, random changes in the photo's brightness. The Strength slider goes from 0 to 10; 10 applies maximum reduction.



Drag the slider until you see the noise disappearing



Corrected image has less image noise

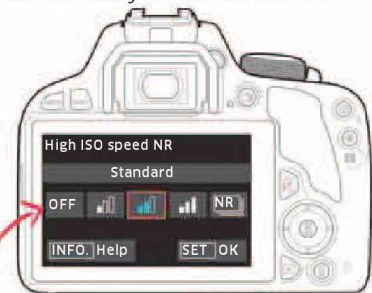
i IN-CAMERA FIXES

Using a low ISO

If you handhold a camera in low light with a low ISO setting, you run the risk of camera shake because a slower shutter speed is usually necessary. Put your camera on a tripod.

Setting noise reduction

Cameras have built-in noise reduction to combat high ISO noise. Noise reduction (NR) can often be adjusted to vary the amount of correction, and needs to be set before shooting.



Noise reduction setting