



GETTING STARTED

Camera types

Improving your photography means taking full control of your camera. Many smartphones and compact cameras lock you out or restrict control of certain aspects of photography, such as the ability to set exposure. To get the best out of this book, it's highly recommended that you use either a bridge camera (also known as a hybrid or prosumer) or an interchangeable lens system

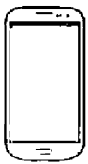
camera (or system camera for short). The latter type is preferable because, as the name suggests, you can switch lenses to suit a particular task. System cameras also let you expand their capabilities by adding other accessories, such as flashguns. System cameras can be neatly split into two groups: digital single lens reflex (dSLR) and mirrorless.



TYPE

PROS

CONS



Cameraphone

- Easy to carry around
- Apps allow you to alter images

- Fixed focal length lens
- Resolution and image quality can be restrictive

Compact



- Easy to carry around
- Inexpensive
- Good zoom lens range

- Limited number of physical controls on camera body
- Restricted range of shooting modes
- Low-light capability is lacking
- Often can't shoot RAW

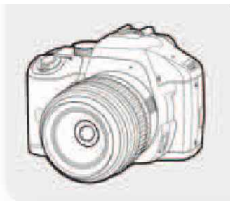
Bridge / Prosumer



- More control over exposure than compact or cameraphones
- Relatively inexpensive

- Lower image quality than system cameras
- Zoom lens is fixed, so less versatile than system cameras

System



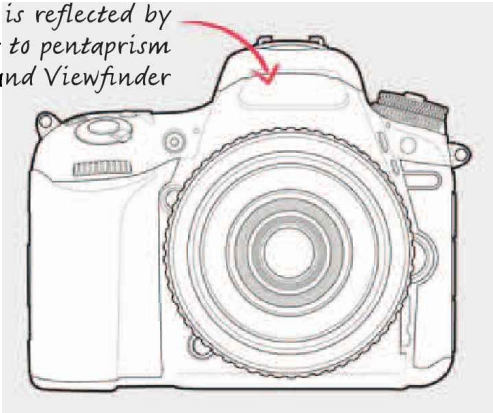
- Image quality
- Expandable capability
- Versatile

- Bulky
- More expensive



DSLR

Light is reflected by mirror to pentaprism and Viewfinder



Optical Viewfinder: Image from lens is projected via mirror and pentaprism to the Viewfinder.

Advantages

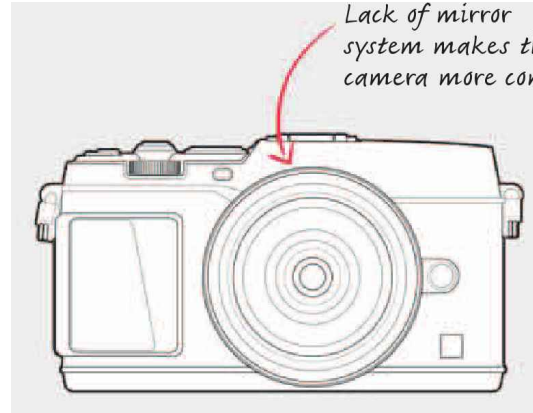
- Based on older film-based systems, so wide range of lenses and accessories available
- Focusing is often quicker than in mirrorless cameras
- Excellent battery life

Disadvantages

- Camera bodies and lenses tend to be larger than mirrorless systems
- Need to switch to Live View mode to preview images on-screen

MIRRORLESS

Lack of mirror system makes the camera more compact



LCD or electronic Viewfinder: Image from sensor is fed directly to the LCD or Viewfinder.

Advantages

- Purely digital system, so lenses are optimized for shooting digital images
- Relatively small size and weight
- Frame rate (the number of shots a camera can shoot per second) is generally higher than dSLRs

Disadvantages

- Mediocre battery life
- Smaller range of lenses and accessories compared to dSLRs

i WHAT YOU'LL NEED

It's fun to buy accessories for your camera, though some are more useful than others. Below are the accessories you'll need for this book.

- Kit lens (see pp.121-125)
- Wide-angle zoom (see pp.124-125, 137-141)
- Telephoto zoom (see pp.124-125, 153-157)
- Tripod (see p.16)
- Remote release (see p.17)
- Filters (see p.17)
- Adobe Photoshop or similar (see pp.22-23)
- Memory card and card reader (see p.24)
- Flashgun (see pp.282-285)



GETTING STARTED

How a camera sees

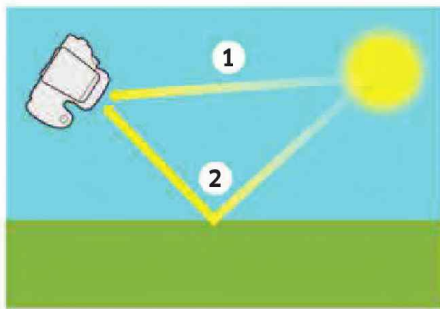
Inside every digital camera is a light-sensitive surface called a digital sensor. When you press the shutter button to take a photo, the sensor collects and records the exact amount of light that falls onto it. This information is then converted in-camera into the data that's needed to make a digital image.



Sensor is exposed to light when the shutter is open

Exposing an image

A digital sensor is covered in millions of microscopic cavities known as photosites. When exposed to light, particles of light (photons) fall into the photosites. When the exposure ends, the camera meticulously counts the number of photons in each photosite and uses this information to create a photo. The darkest areas of the image are those where the fewest photons were recorded by the photosites. Brighter areas are where more photons were recorded.



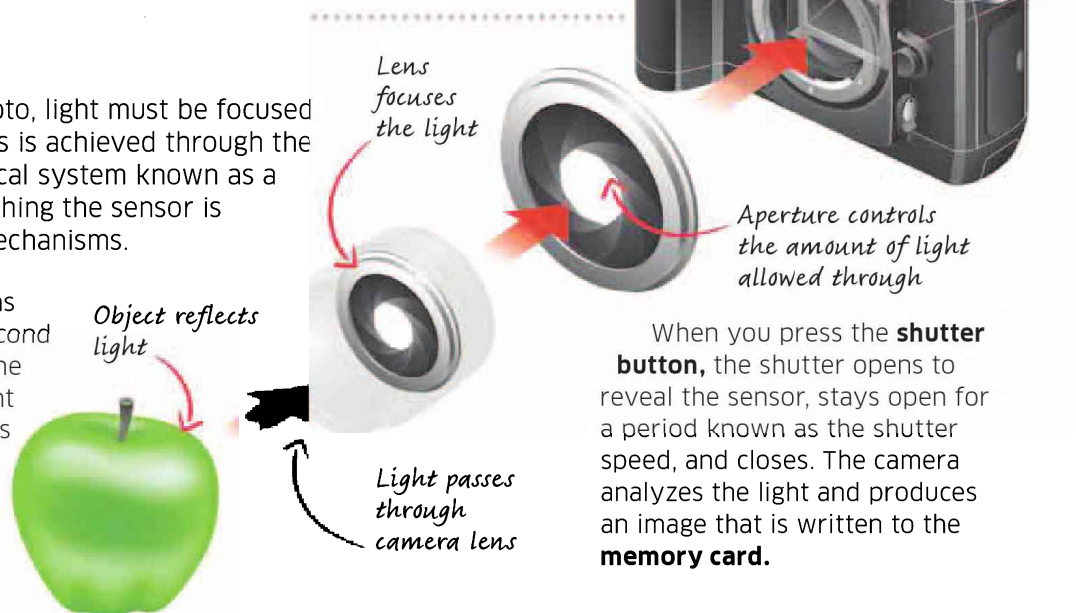
Seeing the light

Light either reaches the camera direct from the light source **(1)**—this is known as incident light—or bounces off objects in a scene before it reaches the camera **(2)**, which is known as reflected light.

Converting light

In order to create a sharp photo, light must be focused precisely onto the sensor. This is achieved through the use of a glass (or plastic) optical system known as a lens. The amount of light reaching the sensor is controlled by two physical mechanisms.

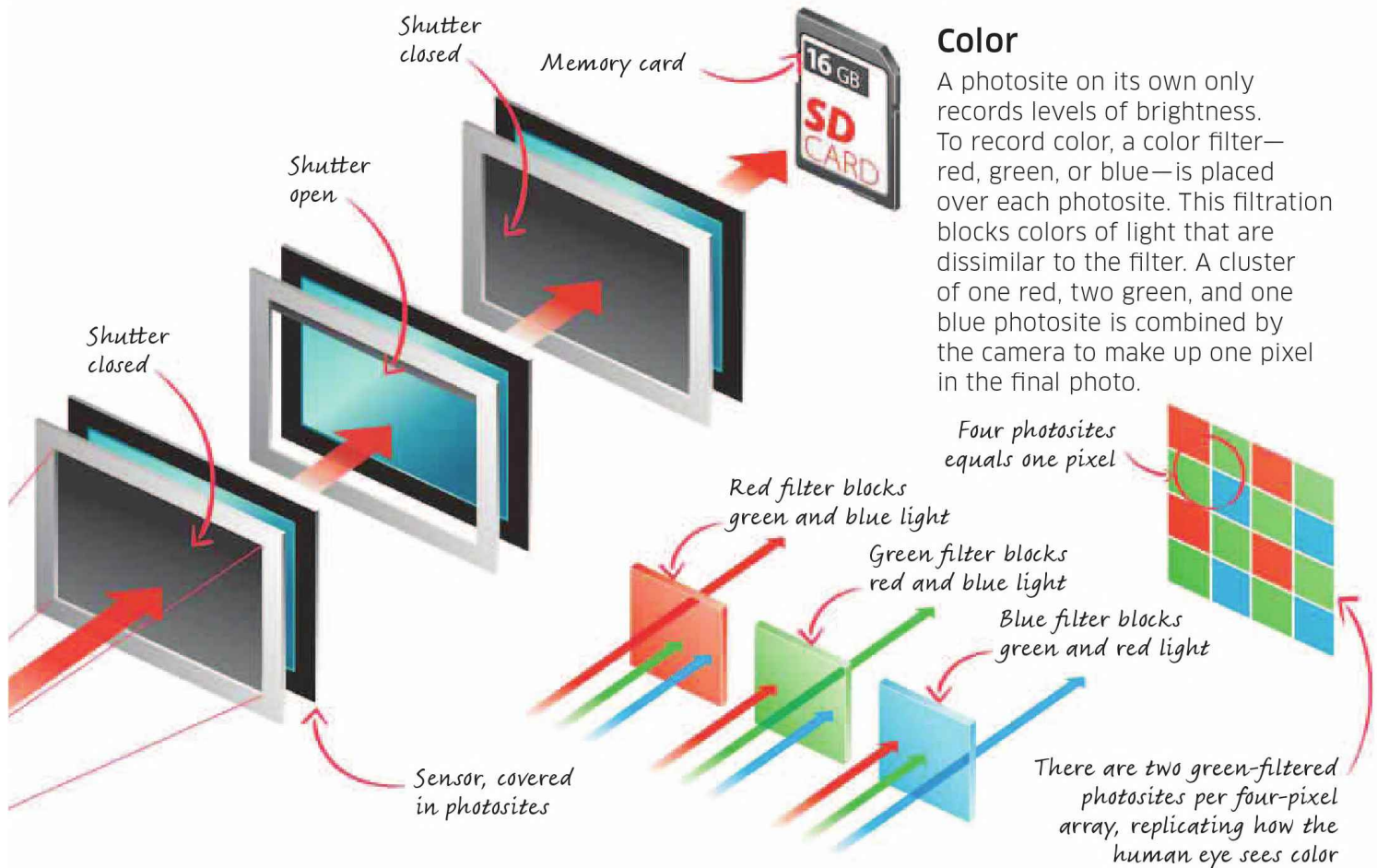
The first is an iris inside the lens known as the **aperture**. The second is a mechanical curtain called the **shutter** that sits directly in front of the sensor. These two controls effectively work like a faucet that lets you turn on and off the flow of photons reaching the **sensor**.



When you press the **shutter button**, the shutter opens to reveal the sensor, stays open for a period known as the shutter speed, and closes. The camera analyzes the light and produces an image that is written to the **memory card**.

Pro tip: If no photons are recorded by a photosite, then those areas will be recorded as black in the final photo and are said to be underexposed.

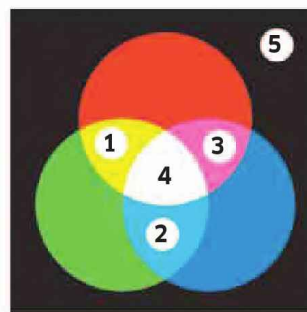
Pro tip: If photosites are filled to capacity, then those areas will be recorded as white in the photo and are said to be overexposed.



i RGB COLOR PROFILE

Red, green, and blue are primary colors. By combining red, green, and blue in different proportions it is possible to create all the colors the human eye can see.

- In a digital photo, the relative proportions of red, green, and blue are represented by three numbers, one each for red, green, and blue in that order (commonly shortened to RGB).
- This range starts at 0, which represents an absence of color, and ends at 255, which represents a color at maximum intensity.



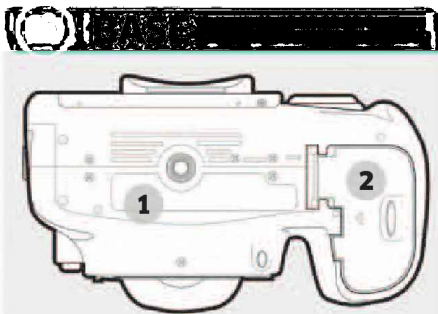
- 1** Red and green combined at maximum intensity produce yellow.
- 2** Green and blue produce cyan.
- 3** Red and blue produce magenta.
- 4** All colors combined produce white.
- 5** No color produces black.



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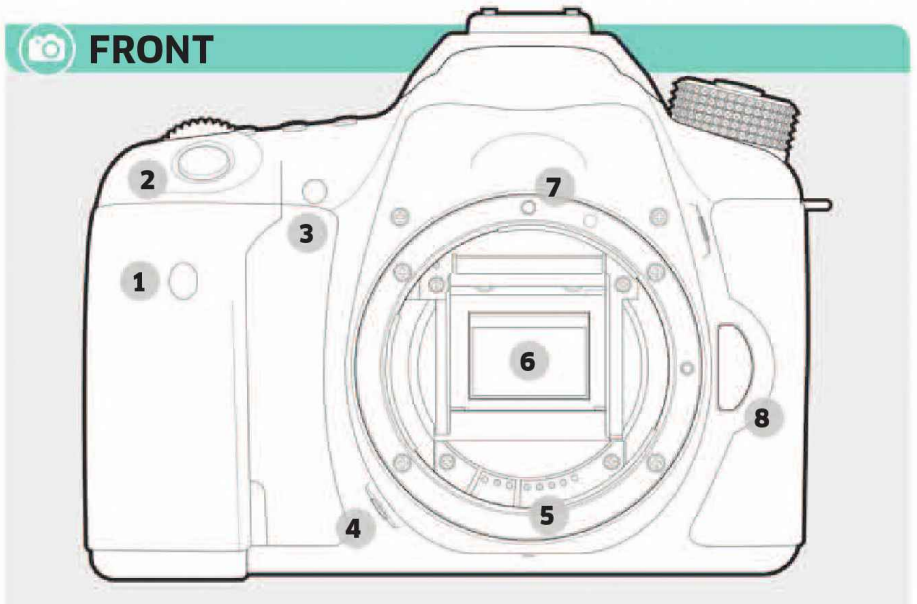
Anatomy of a camera

Modern digital cameras are far more complex devices than their film-based cousins. A digital camera is essentially a computer designed solely for creating pictures. This involves a large number of external dials and menu options to control the camera's functions, which will vary from model to model. Fortunately, once you've mastered one camera, it's generally simple to get to grips with another, particularly if you stick to the same brand.



1 Tripod socket: Lets you mount your camera on a tripod to increase stability and avoid camera shake.

2 Battery compartment: The camera's rechargeable batteries are inserted here.



FRONT

1 Infrared shutter release sensor: Lets you fire the shutter remotely.

2 Shutter button: Opens the camera shutter to expose the digital sensor to light and make a photo.

3 Self-timer light: Flashes to indicate the self-timer duration before the shutter fires.

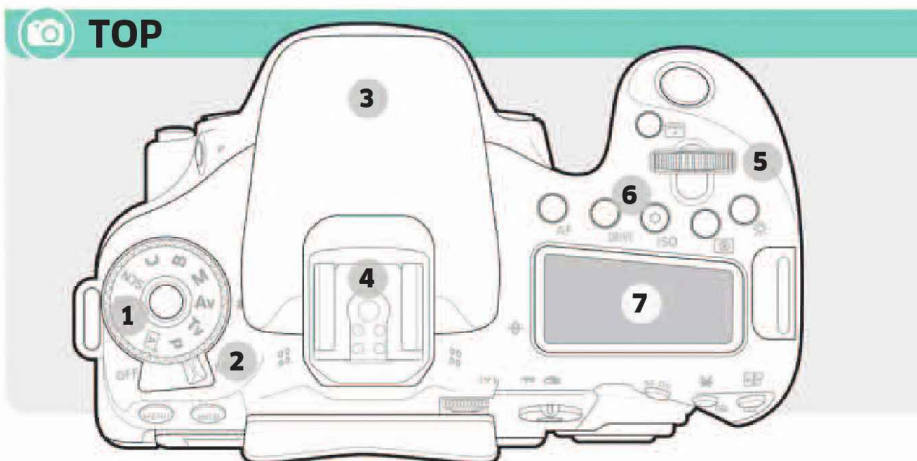
4 Depth-of-field preview button: Closes the lens's aperture to let you preview the extent of sharpness in a photo before you take it.

5 Lens electronic contacts: Let the camera communicate with the lens to set aperture and focus.

6 Reflex mirror: Light from the lens is reflected up from the mirror to the optical viewfinder.

7 Lens mount index: Helps you align your lens correctly when attaching it to the camera.

8 Lens release button: Disengages the lens mount, letting you remove the lens from the camera.



TOP

Pro tip: Many cameras let you choose and save a range of custom shooting settings. This facility is a useful way to configure a camera to your personal style of shooting.

Pro tip: Practice makes perfect. Regular use of your camera will help you find controls intuitively rather than needing to search for them.



1 Menu and info buttons: Let you change camera options and view camera status.

2 Optical viewfinder: Shows the image passed through the lens and reflected off the reflex mirror.

3 LCD monitor: Shows camera menus, Live View, and Playback.

4 Live View/Movie shooting: Switches between Live View and Movie mode.

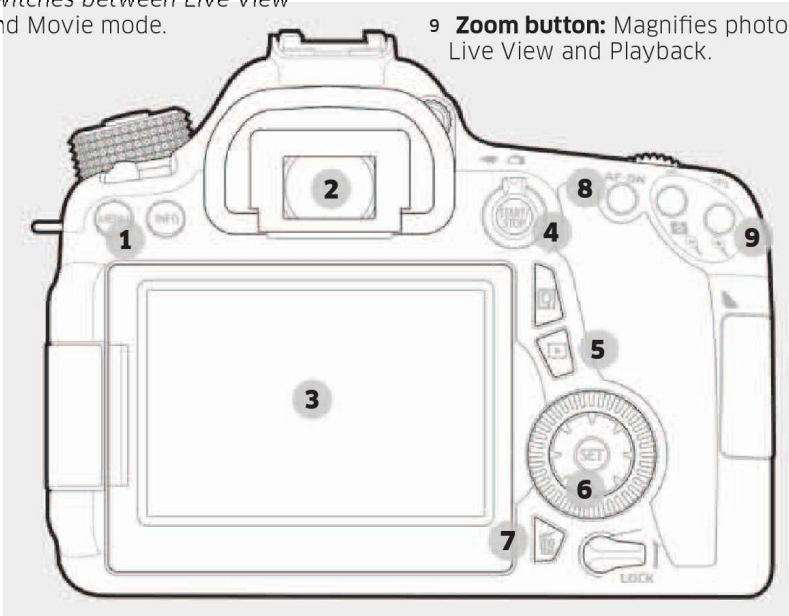
5 Playback button: Lets you review and edit your photos or movies.

6 Control dial: Used to set camera options when shooting images or viewing menus.

7 Delete button: Erases photos stored on the memory card.

8 AF button: Activates the camera's autofocus feature.

9 Zoom button: Magnifies photos in Live View and Playback.



1 Flash button: Raises the built-in flash.

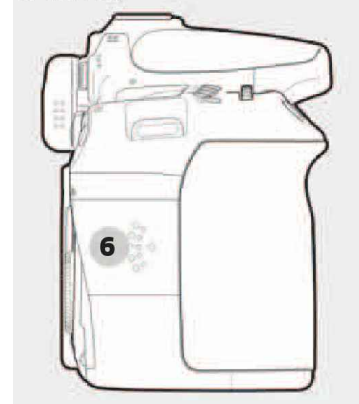
2 Microphone socket: Allows the use of an external microphone when shooting movies.

3 Remote release socket: Used to attach an optional cable-type remote release.

4 HDMI socket: Lets you connect your camera to an HDTV to review your photos or movies.

5 Digital interface: Used to connect your camera to a computer so you can download photos and movies.

6 Memory card cover: A slot that takes a memory card to store photos and movies.



1 Mode dial: Lets you set the required shooting mode.

2 On/Off switch: Turns the camera on and off.

3 Built-in flash: A small built-in flashgun, useful as a fill-in light.

4 Hot shoe: Mount for an external flashgun.

5 Secondary control dial: Used for setting the camera's shooting and menu functions.

6 Shooting option buttons: External controls for setting a limited range of shooting functions.

7 Top-plate LCD: Small LCD showing the shooting options currently set on the camera.



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Using a camera

It's easy to pick up a camera, press the shutter button, and make a photo. What isn't so easy is making a good photo, one that you'd be happy to show others. Many factors influence how good or bad a photo is—starting with how you handle your camera when shooting. Sloppy technique will lead to disappointing photos no matter how exciting your subject is. Good technique will improve your chances of shooting a pleasing photo.

HOLDING A CAMERA



Camera shake is unsharpness in a photo caused by camera movement during shooting. Holding a camera incorrectly is the most common cause. The heavier the camera and lens combination, the more important it is to support your camera correctly.

Do

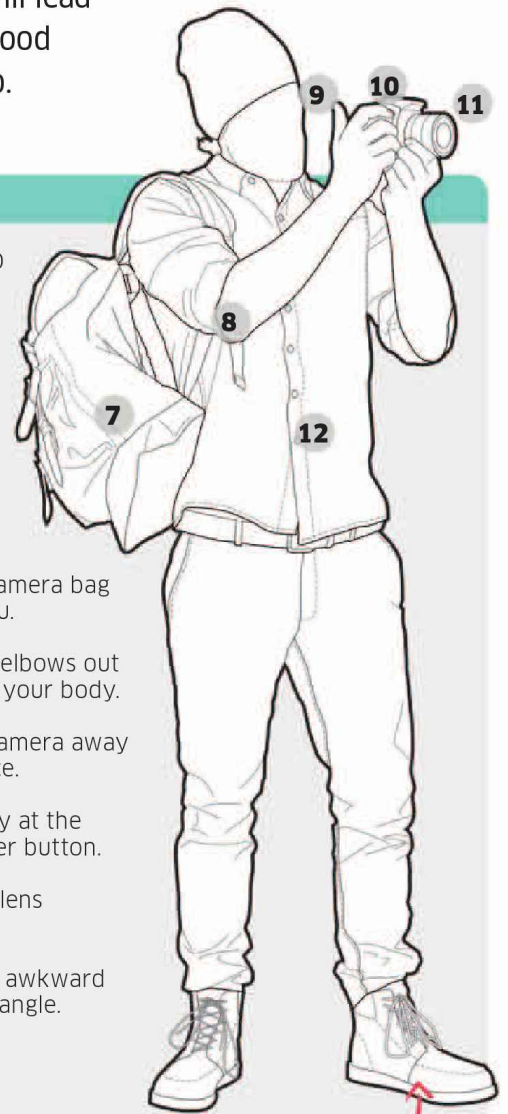
- 1 **Use** your left hand to support the lens from below.
- 2 **Grip** the camera firmly.
- 3 **Look** through the camera's Viewfinder if it has one.
- 4 **Hold** your elbows lightly against your body.
- 5 **Stand** upright with your feet shoulder-width apart.
- 6 **Breathe** in and then slowly out—gently press the shutter button fully down before breathing back in.

A stable, relaxed stance makes camera shake and fatigue less likely

Don't

- 7 **Let** your camera bag unbalance you.
- 8 **Hold** your elbows out to the side of your body.
- 9 **Hold** the camera away from your face.
- 10 **Jab** sharply at the camera shutter button.
- 11 **Leave** the lens unsupported.
- 12 **Lean** at an awkward and unstable angle.

Wear comfortable footwear and keep both feet flat on the ground

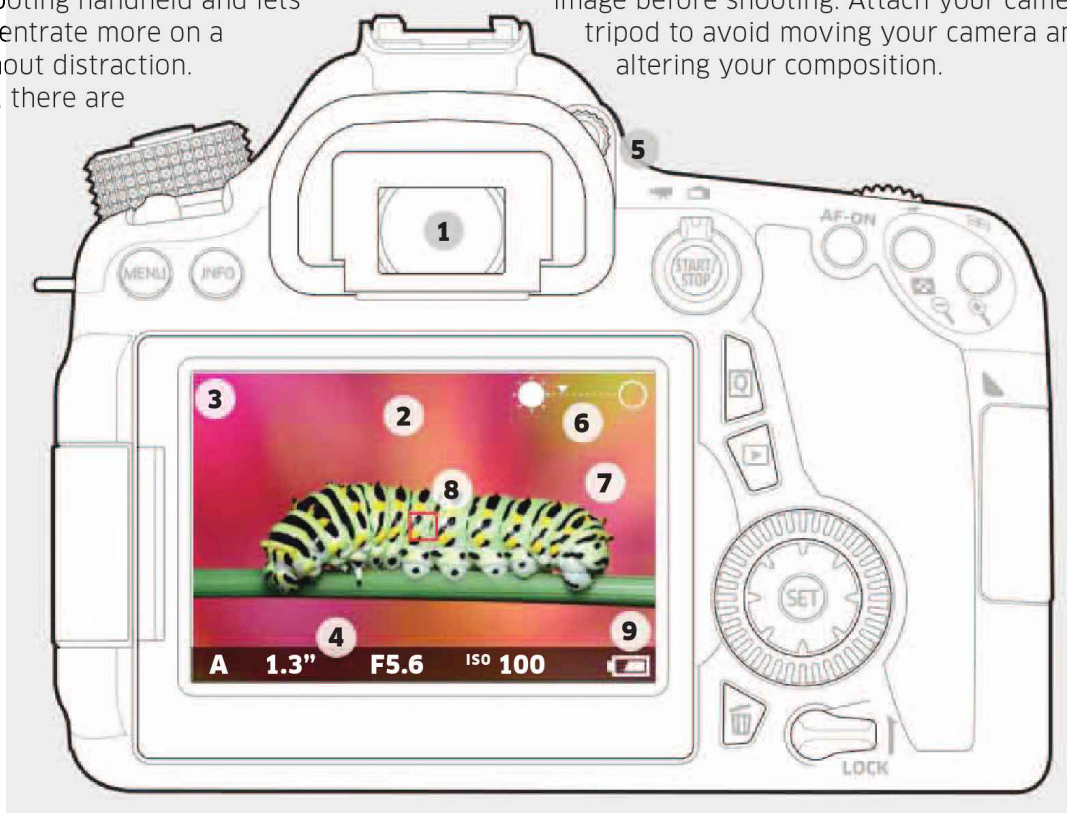


Pro tip: Not all optical Viewfinders show you 100 percent of the scene you're shooting. Be aware of this limitation when composing your shots.

Pro tip: Leaning against a wall or supporting your camera on a fence post are easy ways to keep the camera more stable when shooting handheld.

Using a Viewfinder **(1)** has several advantages compared to using the rear LCD **(2)**. When looking through a Viewfinder, you rest the camera against your face. This makes the camera more stable when shooting handheld and lets you concentrate more on a shot without distraction. However, there are

advantages to using a rear LCD as well. You can zoom into the Live View display to check your focus before shooting. It's also easier to see the effects of functions such as white balance on your image before shooting. Attach your camera to a tripod to avoid moving your camera and altering your composition.



Do

When composing, look around the edge of the Viewfinder or LCD screen **(3)**, not just at the center.

Temporarily switch off icons and information **(4)** on the LCD when composing as they may obscure key details.

Set eyesight correction on a Viewfinder if necessary **(5)**.

Set the correct brightness **(6)** for the LCD.

Don't

Use the image on the LCD as a guide to exposure **(7)**.

Forget to check that the camera is focusing in the right place **(8)**.

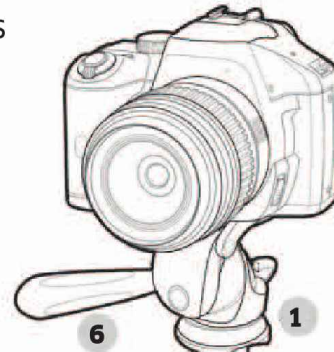
Leave the LCD on for any longer than necessary—switching it off will conserve battery power **(9)**.



GETTING STARTED

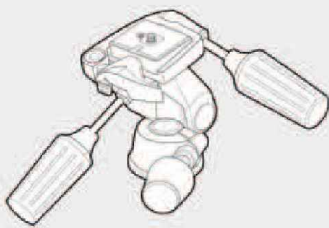
Helpful accessories

The appeal of using a system camera is that its capabilities can be expanded by the addition of optional accessories. Which accessories are right for you will depend on your style of shooting. With so many options available, the key to choosing a camera accessory is to be honest with yourself. Only buy an accessory that you know will either make your photographic life easier or lead to an improvement in your photography.



TRIPODS

A tripod supports a camera so that it doesn't move during an exposure. Height is adjusted by raising or lowering the length of the tripod legs. Often a center column allows you raise the height of the camera still further. Tripods come either as legs only or with a head permanently attached. Buying a tripod and head separately is more costly, but means you can mix and match to suit your needs. The two basic types of head are three-way (also known as pan-and-tilt) and ball (or ball-and-socket).



THREE-WAY HEAD

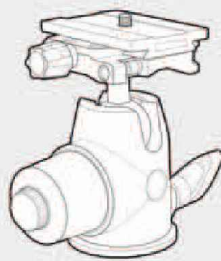
Camera orientation is adjusted by moving the head one of three ways using locking levers.

Advantages

- One axis can be adjusted at a time
- Inexpensive

Disadvantages

- Relatively bulky



BALL HEAD

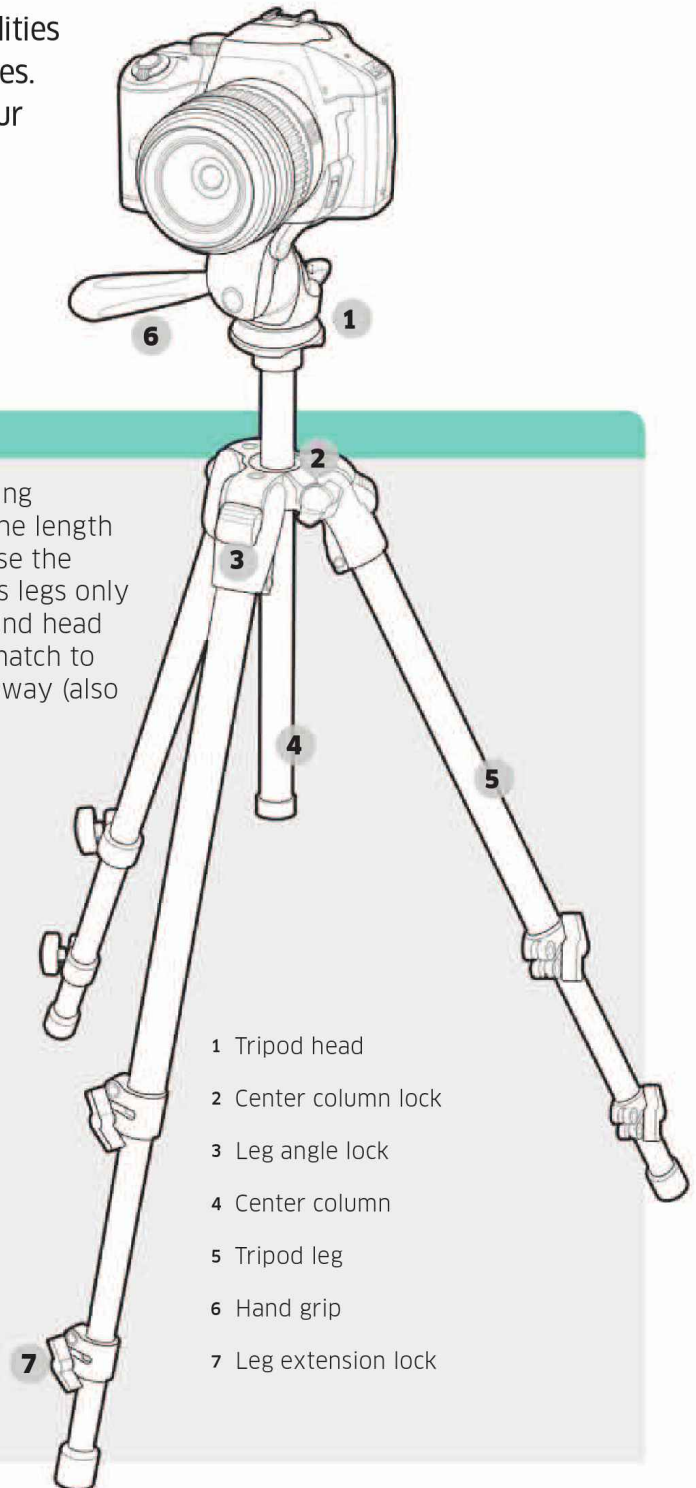
Camera orientation is adjusted by loosening a ball-and-socket joint.

Advantages

- Small size and weight
- Good weight-to-strength ratio

Disadvantages

- Can be difficult to make fine adjustments

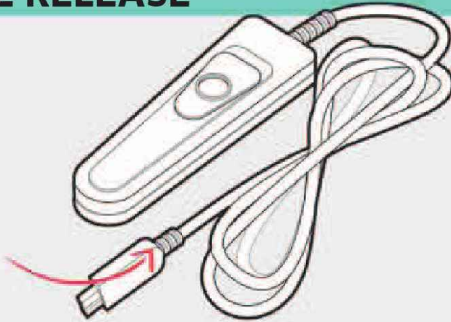


Pro tip: A tripod center column lets you raise the camera higher than would be possible with the tripod legs alone. However, raising the center column can make the tripod less stable.

Pro tip: Photographers often add a UV or skylight filter to their lenses. These don't affect exposure but can help protect the lens glass from damage.

REMOTE RELEASE

Keep the wire of the remote release loose to avoid pulling the camera over

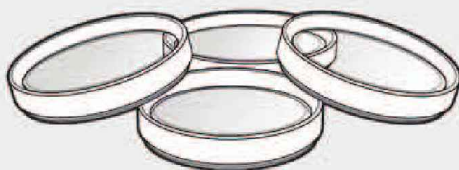


A remote release lets you fire the shutter without pressing the camera's shutter button, so when the camera is on a tripod you can't accidentally bump it when making a photo. Infrared remote releases are wireless but have limited range. Cable remote releases attach to a special socket on the camera and often have a switch to lock the shutter open.

FILTERS

Filters are sheets of plastic, optical resin, or glass that, when added to the front of a camera lens, adjust the light passing through the lens. How the light is adjusted depends on the filter.

- Some types of filters add color to the light and thus add color to the final photo. Warm-up filters, for example, add yellow-orange to a shot.
- Other types of filters can be used to reduce the amount of light entering the camera. These filters are known as Neutral Density (ND) filters.
- Filters are bought in one of two forms: screw-in or filter holder.



SCREW-IN

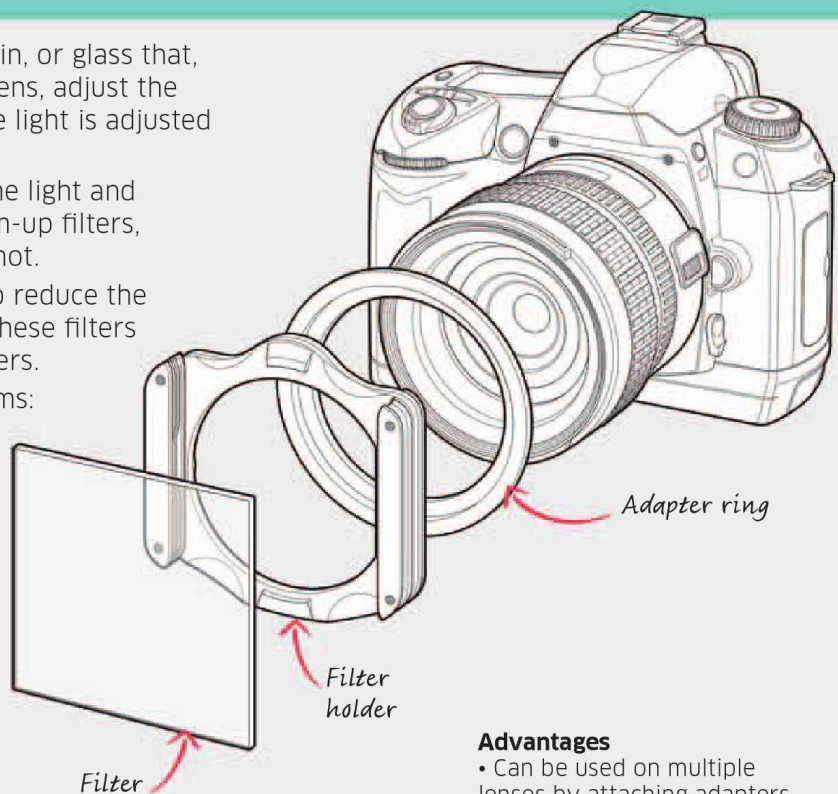
Circular filters that attach directly to the filter thread of a lens.

Advantages

- Good range of types readily available
- Inexpensive

Disadvantages

- Often need to buy multiple filters if you have more than one lens



FILTER HOLDER

Square filters slot into a filter holder that is attached via an adapter to a lens.

Advantages

- Can be used on multiple lenses by attaching adapters to the lenses

Disadvantages

- Initially expensive
- You get locked into one manufacturer's filter system



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Out and about

Buying a camera can involve a considerable outlay of money. This can make for a slightly nerve-wracking experience the first time you take the camera out of the house. Ultimately, however, a camera should be used as often as possible. It's difficult to get to grips with a camera unless you spend time making use of it. As long as you take certain precautions, there's no reason a camera should come to any harm when you're out shooting.



ANIMALS

Pets and domestic animals are easier to photograph than wild animals, which are more wary of people. Studying an animal's behavior helps you predict what it will do. Spend time observing and waiting for the right moment and you will be rewarded.

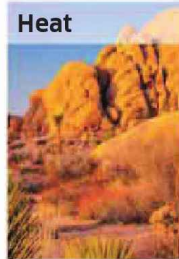
- **Keep a low profile** when shooting wild animals. Wear drab clothing and shelter behind cover whenever possible.
- **The animal's welfare** is far more important than any photo.
- **Don't cause** any unnecessary distress to the animal. Don't disturb nests or dens.
- **Be aware** of your own safety—a frightened animal may hurt you if you're blocking its escape route or getting too close to its young.



WEATHER CONDITIONS

Cameras are generally reasonably rugged devices, but they do have their limitations. Certain weather conditions require extra care.

Heat



- **Extreme heat** can warp camera components. Keep your camera in the shade when it's not in use.
- **In dry conditions**, keep lens changes to a minimum to prevent dust from coating the camera's sensor.

Cold



- **Temperatures** close to and below freezing drain battery power. Keep a spare battery or two warm inside your jacket to swap when necessary.
- **Cold fingers** make a camera harder to operate. Use gloves or fingerless mittens.

Humidity



- **If moving** from a hot, humid location to a cooler one, check for condensation forming on the lens.
- **Use a dry cloth** to wipe away condensation as soon as it occurs. Keep the camera in a warm, well-ventilated place to dry it out still further.

Rain



- **Cameras** are often advertised as weatherproof, but in the rain the lens mount may let water in.
- **Shelter** your camera using a waterproof cover or umbrella. Check the front of the lens, too; you may not notice rain spots in your shots until you're home.

Pro tip: When you're out taking photographs, don't be afraid to shoot more than you instinctively would; you can always edit out the unsuccessful shots later when you get home.

Pro tip: If you're shooting in cold conditions and your camera has a touchscreen, use touchscreen gloves so you can use the screen without exposing your fingers.



LANDSCAPES

Shooting landscapes invariably means being outdoors in the country. This brings its own challenges. Before you set off on a photography expedition, let someone know where you're going and what time you plan to return.

- **Check the weather** before you leave and dress appropriately.
- **Take food** and water with you, particularly if you plan to be out for a full day.
- **Don't take** unnecessary risks when shooting; it's all too easy to lose your footing.
- **If you plan** to shoot on private land, be sure to ask permission first.
- **Finally**, be conservation-minded and cause as little disruption or damage as possible to the environment.



PEOPLE

It's always easier to shoot photos of people who know and trust you. Many people dislike having their photo taken: don't cajole, gently persuade. Ultimately, you need to respect your intended subject's feelings; don't press the matter if they really don't want to have their photo taken.

- **Always ask** permission before you photograph children. This is a sensitive issue. Don't shoot candid shots of children you don't know, as this may look suspicious.
- **Be friendly** and engage with your subject, making the session a more personal affair. Good humor goes a long way toward achieving some of the best results.
- **Do not** shoot in areas where taking photographs would be culturally insensitive.



■ **The use** of a few local words—such as “please” and “thank you”—will go a long way when seeking permission to shoot portraits of strangers in a foreign country. However, be aware of boundaries.

■ **Review each shot** to check your subject's facial expression. Show them your shots, too, to get their opinion; portraiture is not a one-way process.



GETTING STARTED

The digital workspace

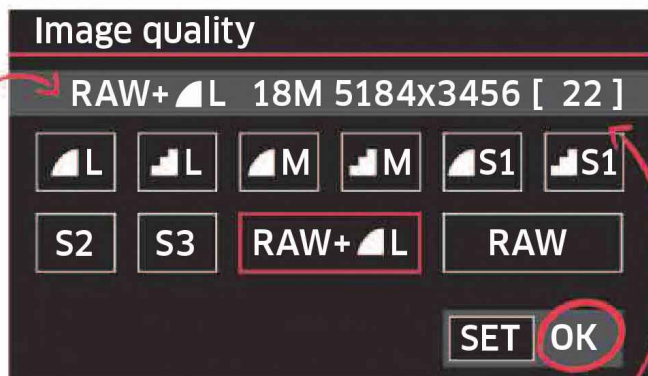
An appealing aspect of digital photography is the low cost of shooting: once you've bought your camera, each shot you subsequently make is essentially free. It's all too easy to amass thousands of shots. This can lead to frustration when you attempt to find one particular shot out of a multitude, so it's well worth taking a disciplined approach to storing your digital photos.



Distinctive as a photo may be, without care it may soon be lost in the crowd.



FILE TYPES



Saving in both RAW and JPEG will give you the best of both worlds

For still images, system cameras let you choose between two file types: JPEG or RAW. JPEG images can be identified by the use of a .JPG suffix after the image file name. There is no standard RAW file suffix; each camera manufacturer produces its own variation on the format, with a suffix unique to the manufacturer: Nikon, for example, uses .NEF for its RAW files, whereas Canon uses .CR2.

Memory card space is used more quickly when shooting RAW and JPEG



JPEG OR RAW?

- JPEGs take up far less space on a memory card compared with RAW.
- JPEGs, once they're on your computer, can be opened and used by many types of software (such as word processors); a RAW file can only be opened using special RAW conversion software.
- However, in order to make the JPEG's file size smaller, very fine detail is thrown away when the camera saves the file.
- JPEGs also allow for far less adjustment after shooting due to the loss of image quality. RAW, though ultimately more time-consuming to use, offers more scope for fine-tuning.

Pro tip: Cameras allow you to create new folders. This is a good way to keep certain types of images (such as those from different shooting sessions) separate on a memory card.

Pro tip: New folders can be created when a memory card is attached to your computer. The folder must be created inside the DCIM folder on the memory card and follow the folder naming convention.

FILE NAMES



You don't have to use the camera's naming convention once the photos are on your computer

Digital cameras use a logical naming convention for images: typically, a standard four-character prefix followed by a four-digit number. The prefix varies between camera brands, but is generally standard across a brand's range of cameras.

- The four-digit number is a consecutive count of each image you shoot starting from 0001 and ending in 9999. Some cameras let you reset the count depending on certain conditions.

FOLDERS

Images are stored on a memory card in folders. Folders are named using a three-digit prefix followed by three standard characters (depending on the camera brand). The prefix is a consecutive count of the folders created on the memory card.

- A folder can hold up to 9,999 images. When that limit is reached, a new folder will be automatically created and images stored in the new folder from that point on.



Create a folder for different shooting sessions to keep photos separate

CREATING A LOGICAL FILING SYSTEM

When camera file names reach 9999, the count is reset back to 0001; thus, after 10,000 shots, there will be photos with the same file name. Unique file names help you locate a particular shot, so renaming your photos once they're imported to your computer is vital (see pp.30-31).

- Use a consistent file naming system that's easy to follow but will never repeat.
- Group photos in logical folders, such as animals > birds > eagles.
- Adding keywords to your images will also help you find a specific photo (see pp.342-343).



Rename only the photos you want to keep



GETTING STARTED

Post-production

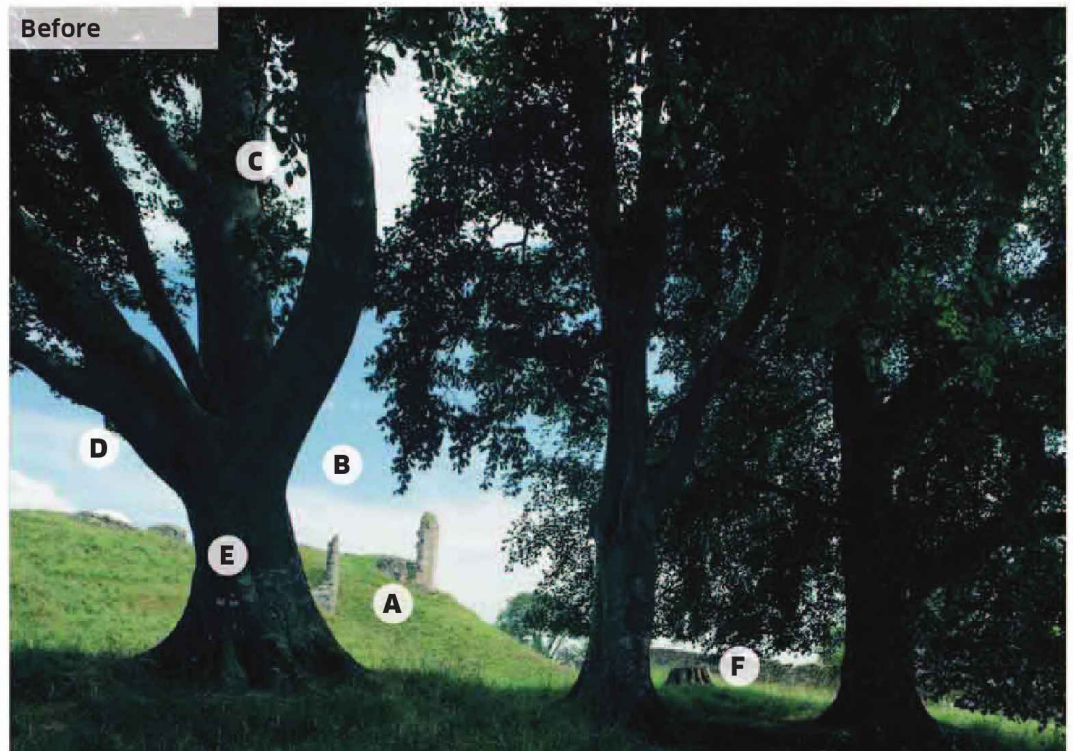
It takes time and skill to get the exposure right as well as the color and contrast while taking a photo. However, sometimes the final image needs an extra polish after shooting. This can be done using image-adjustment software installed on your computer. Working on a photo after shooting is known as post-production.

i SOFTWARE

The most popular choice of image-adjustment software is Adobe Photoshop and its variants, Elements and Lightroom. Photoshop will be used throughout this book. Don't worry if you use other software: many of the tools described are common to most image-adjustment software.



A Flat color: Photos that look pale or washed out often benefit from an increase in the vividness of the colors. This is known as increasing the color saturation (see pp.246–247).



B Noise: This is seen as a random gritty pattern that obscures fine detail in a photo. It is caused by a camera's electronics corrupting the information in an image during exposure. Noise reduction in post-production can improve things (see pp.86–87).



C Chromatic aberration: Visible light is made of different wavelengths on the spectrum of colors. A lens that can't focus all the wavelengths of light to the same point will create red/green or magenta/blue fringes around the edges of objects (see pp.134–135).

Pro tip: Tools to apply effects to photos are found in the Filters menu. A particularly useful tool is the Lens Correction tool, which can be used to correct common lens problems such as distortion.

Pro tip: Always duplicate an image and carry out any post-production work on the copy. That way you can return to the original if you don't like any of the digital adjustments you've made.



D Color balance: Light isn't always neutral in color. When light has a color bias, such as red or blue, this will be seen in the final photo unless corrected. Color bias can either be adjusted in-camera, using a function known as white balance, or later in post-production (see pp.253-263).



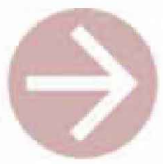
E Deep shadows: Uneven lighting causes high contrast between the brightness of a scene's shadows and highlights. The relative brightness can be adjusted in the final photo (see pp.310-311).



F Cloning: Photos are often marred by overlooked details or by dust on a camera's sensor. In post-production, the clone brush tool lets you paint out areas of a photo, using details from another part of the photo (see pp.166-167).

i OTHER POST-PRODUCTION ADJUSTMENTS

- Basic fixes (see pp.38-39)
- Sharpen photos (see pp.54-55)
- Add or remove contrast (see pp.102-103)
- Adjust depth of field (see pp.118-119)
- Fix perspective (see pp.150-151)
- Create a panorama (see pp.166-167)
- Make local adjustments (see pp.182-183)
- Add blur (see pp.198-199)
- Crop a photo (see pp.214-215)
- Make targeted adjustments (see pp.230-231)
- Use the Levels tool (see pp.278-279)



GETTING STARTED

Computers

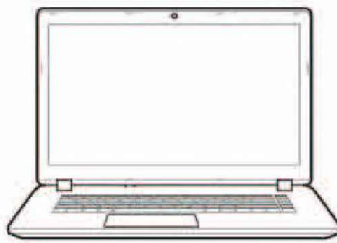
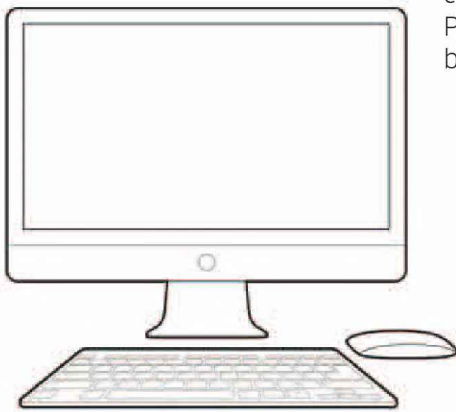
Once you've shot your photos, you'll need to copy them from a memory card to a computer. Although cameras often feature functions such as RAW conversion, these functions are usually

rudimentary. Copying your photos to a computer will give you greater scope for viewing and adjusting your photos, and for printing them, too (see pp.346–347).



COMPUTER TYPES

- PCs can be divided into two basic types: desktops and laptops.
- Storing and processing digital photos requires far more from a PC than other tasks such as sending emails or using a word processor. While desktop PCs offer greater performance for less money than laptops, the portability of laptops is ideal if you need to be mobile.
- There are two dominant operating systems: Microsoft Windows and Apple Mac OS X. Both types have their devotees, but this is largely a matter of personal choice. Software such as Adobe Photoshop is available for both platforms.



MONITORS

The quality of your PC's monitor and the ambient light in the room in which you work are both important factors, as they determine how accurately you will be able to judge color and contrast in your photos.

- A monitor used for photo editing should have a wide viewing angle. Color and contrast can shift unacceptably when not looking directly at a monitor that has a narrow viewing angle.
- The room you work in should have low ambient lighting. Avoid direct light shining on your monitor screen; this makes it more difficult to judge color and contrast in your photos.



MEMORY AND STORAGE

Whichever type of PC you use, it should have sufficient memory to allow you to run post-production software effectively—8–16 GB is now considered the baseline requirement, though more is always better than less. The hard drive should also be large enough that you won't run out of space easily. Hundreds or thousands of high-resolution RAW files will quickly fill a small hard drive. If possible, budget for a 1TB or even 2TB hard drive as well as a similarly-sized external hard drive to make backups of your photos.

