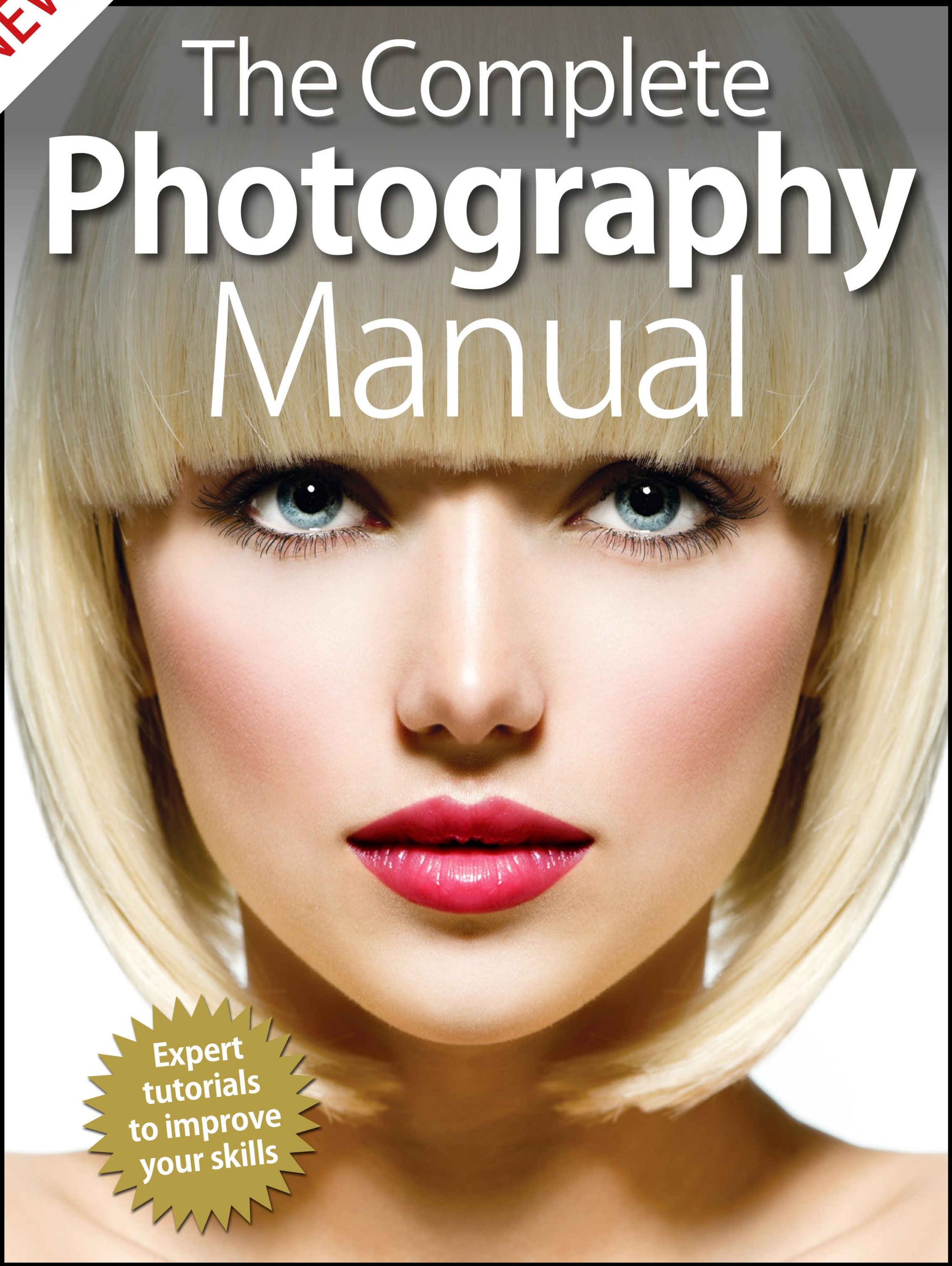
NEW

The Complete Photography Manual



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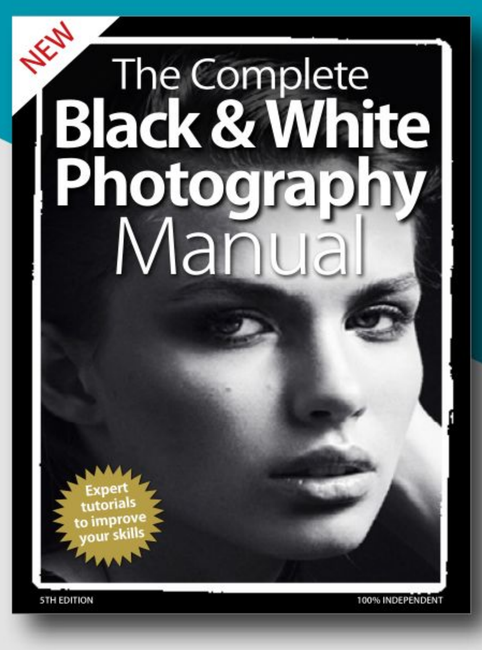
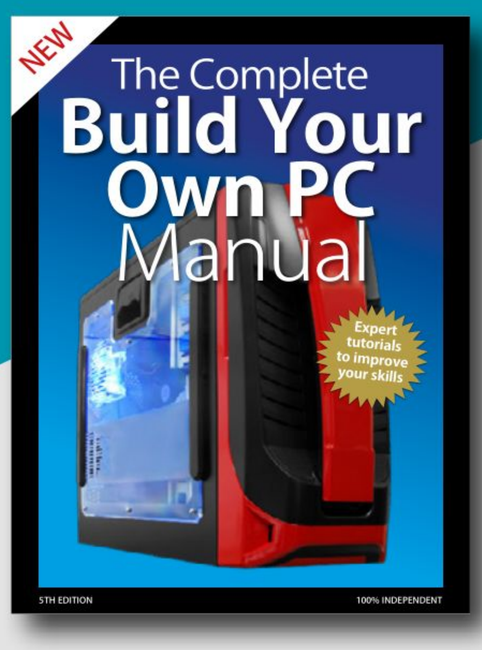
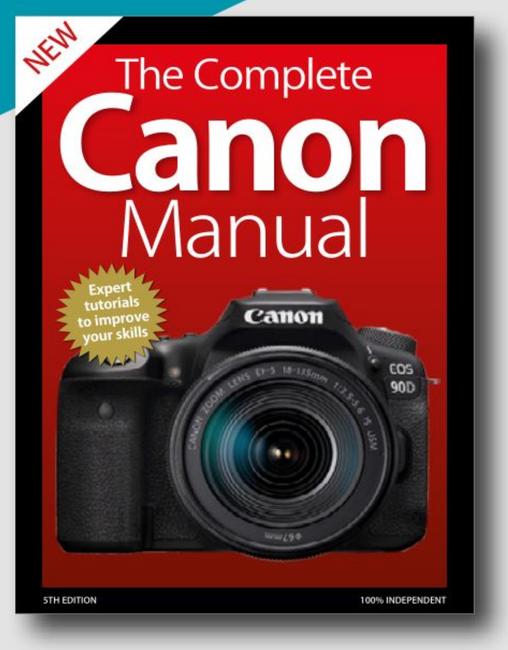
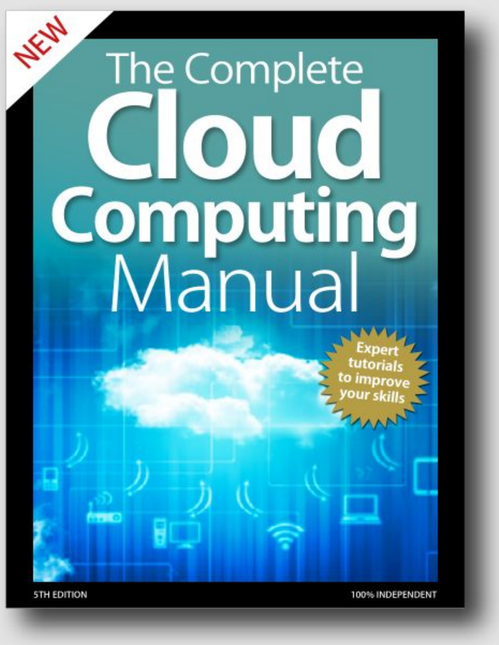
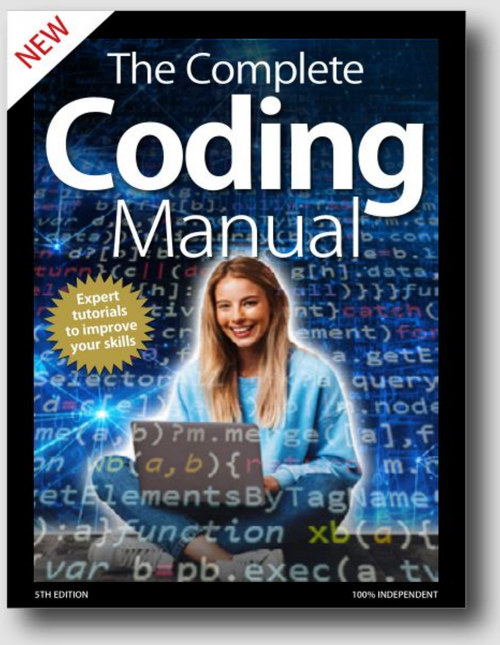
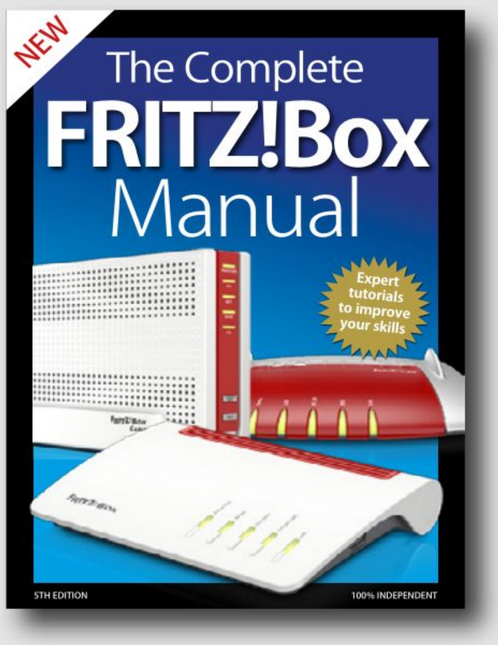


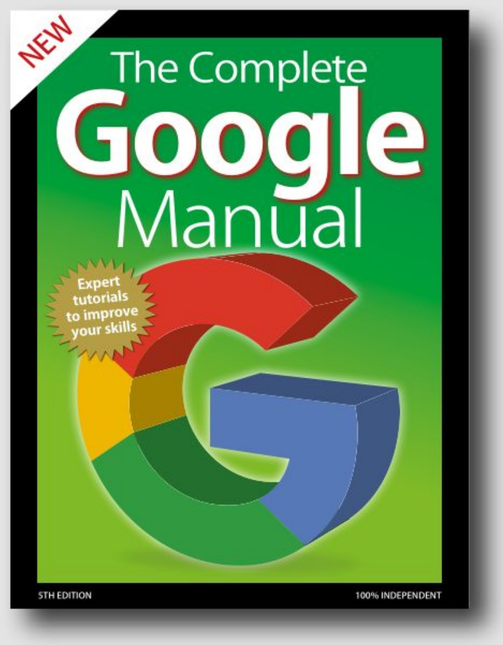


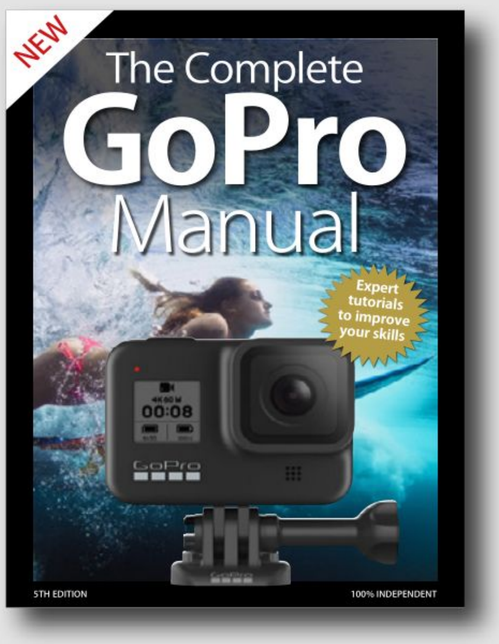


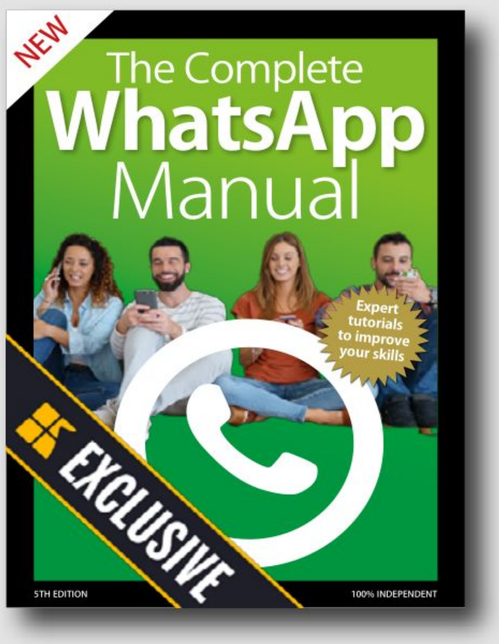


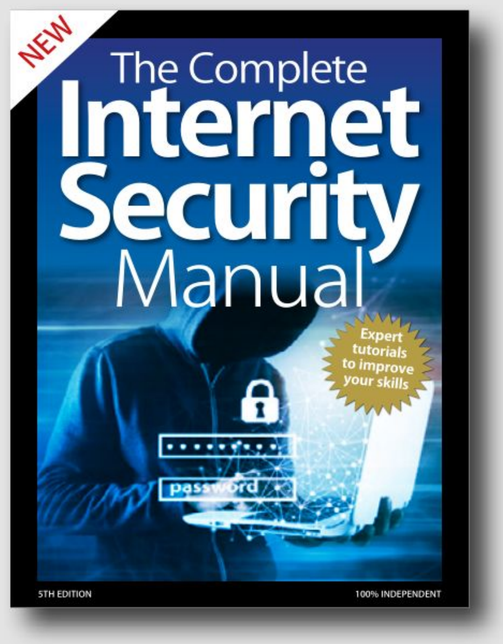


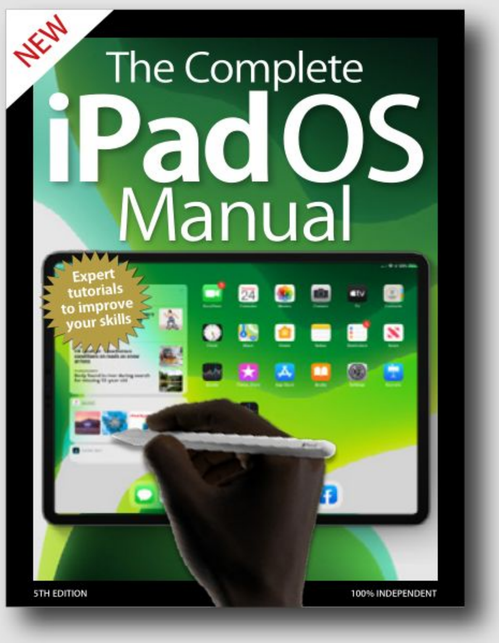


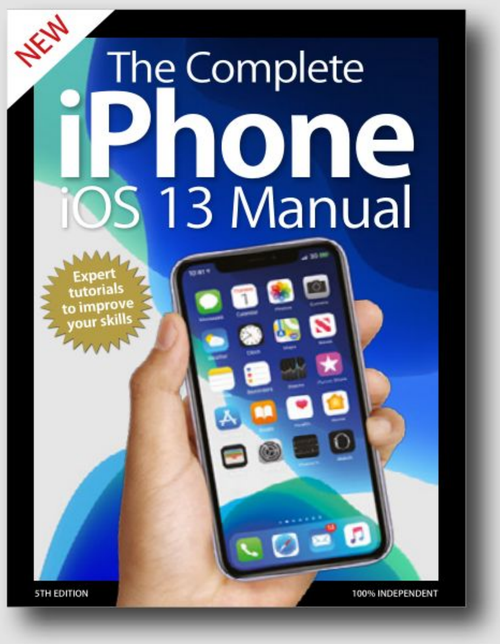


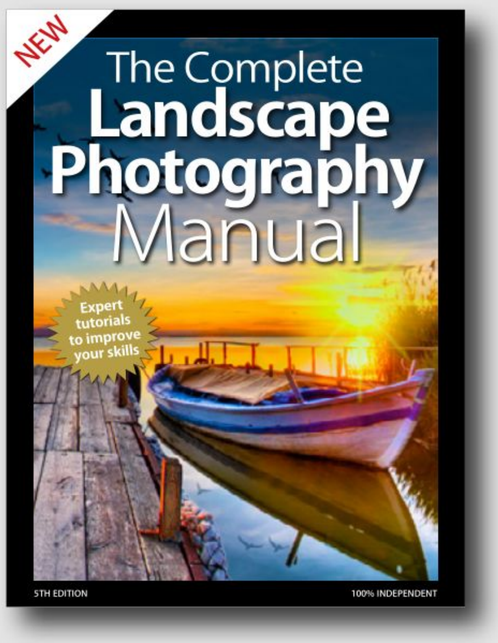


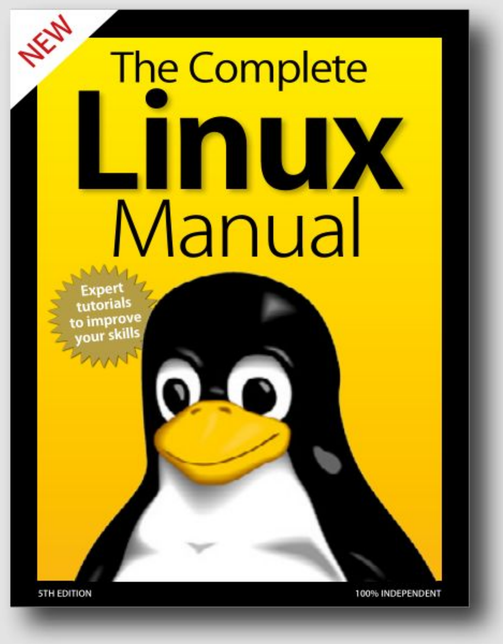




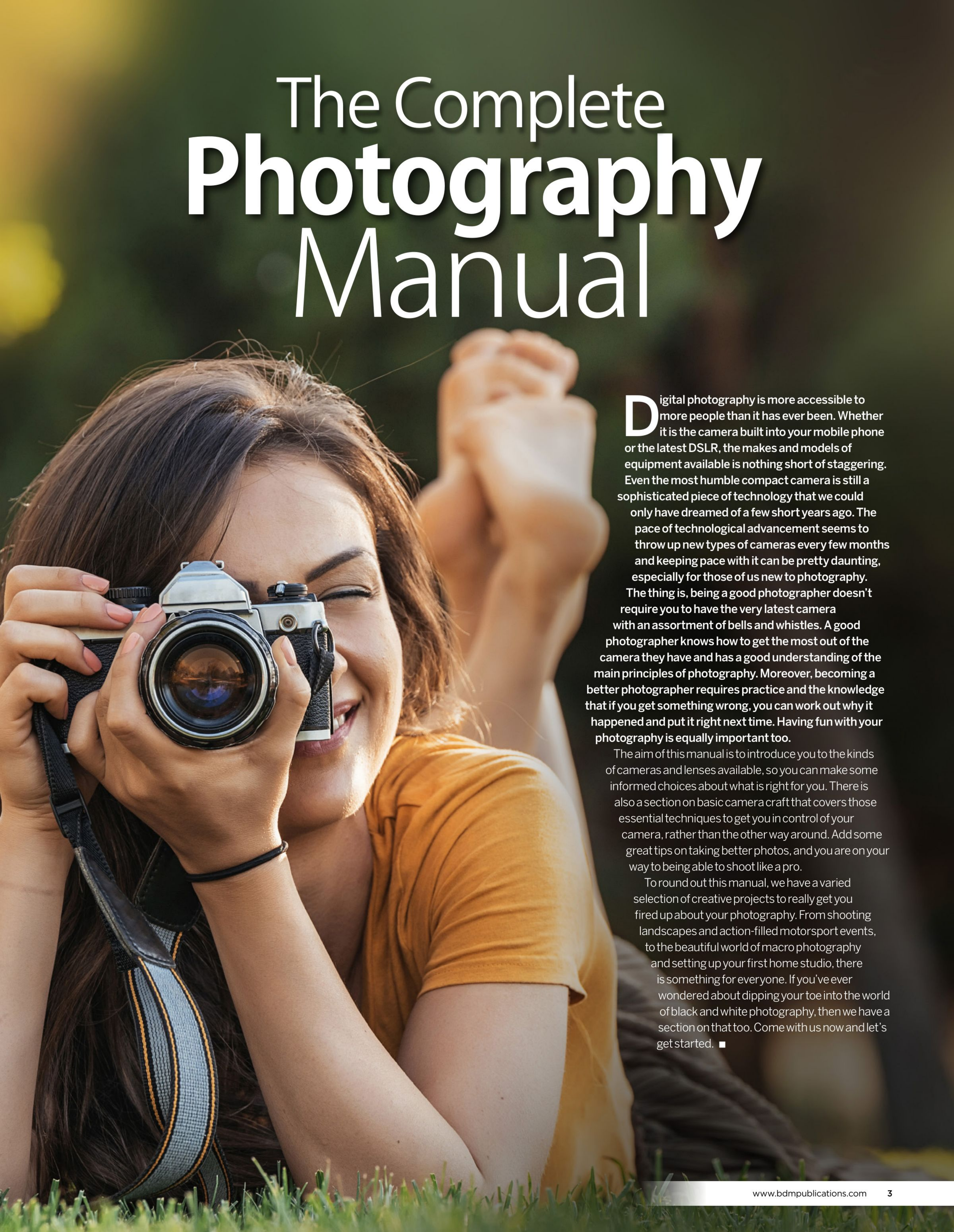








The Complete **Photography** Manual



Digital photography is more accessible to more people than it has ever been. Whether it is the camera built into your mobile phone or the latest DSLR, the makes and models of equipment available is nothing short of staggering. Even the most humble compact camera is still a sophisticated piece of technology that we could only have dreamed of a few short years ago. The pace of technological advancement seems to throw up new types of cameras every few months and keeping pace with it can be pretty daunting, especially for those of us new to photography.

The thing is, being a good photographer doesn't require you to have the very latest camera with an assortment of bells and whistles. A good photographer knows how to get the most out of the camera they have and has a good understanding of the main principles of photography. Moreover, becoming a better photographer requires practice and the knowledge that if you get something wrong, you can work out why it happened and put it right next time. Having fun with your photography is equally important too.

The aim of this manual is to introduce you to the kinds of cameras and lenses available, so you can make some informed choices about what is right for you. There is also a section on basic camera craft that covers those essential techniques to get you in control of your camera, rather than the other way around. Add some great tips on taking better photos, and you are on your way to being able to shoot like a pro.

To round out this manual, we have a varied selection of creative projects to really get you fired up about your photography. From shooting landscapes and action-filled motorsport events, to the beautiful world of macro photography and setting up your first home studio, there is something for everyone. If you've ever wondered about dipping your toe into the world of black and white photography, then we have a section on that too. Come with us now and let's get started. ■

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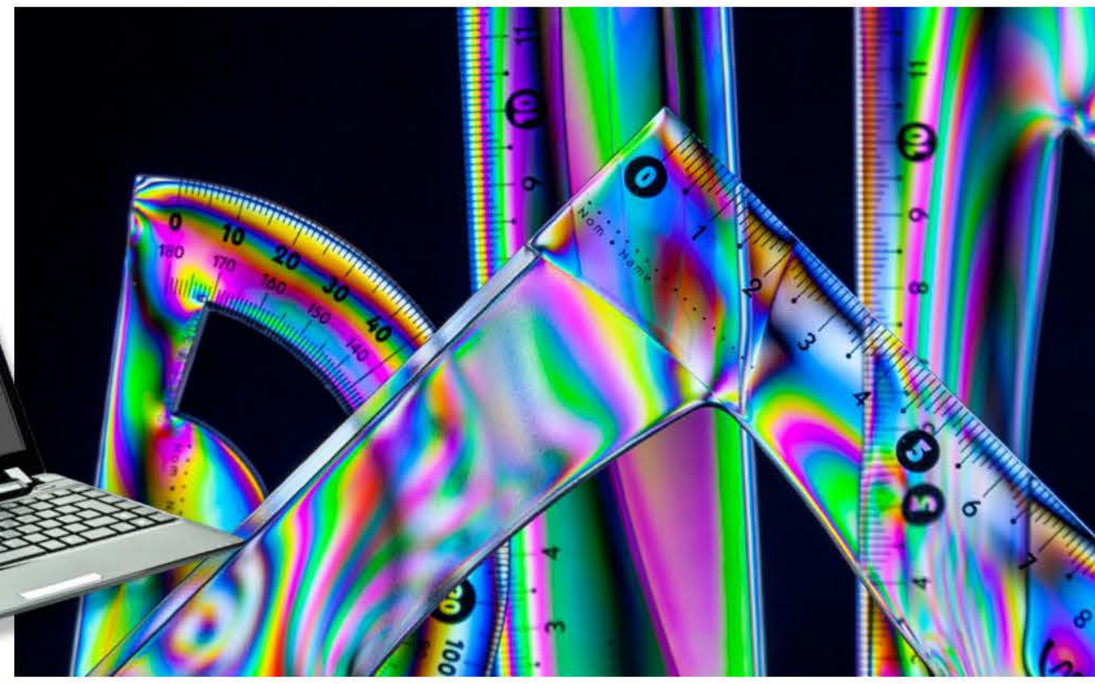

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GETTING STARTED

Take the first step into the world of digital photography

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Thinking of getting your first digital camera, or maybe you are looking to upgrade that old point and shoot you usually take on holiday with you? For anyone looking to get a new camera, the choice available is actually quite overwhelming. With so much to choose from, the chances of picking the wrong type of camera for your needs are an all too likely probability and could end up being an expensive mistake. With that in mind, this section is here to outline the main types of cameras available and tell you a little about their main capabilities in order for you to better understand what kind of camera is right for you, starting from the humble compact camera all the way up to 50MP DSLRs.

After the choosing of a camera comes lens selection. We also have a section on the main types of lenses available for interchangeable lens cameras covering prime, zoom, macro and telephoto lenses and describes how they are generally used to give you an idea of what lenses are required for the kinds of photography you want to shoot. There is also a useful guide on tripods, an essential piece of equipment that is a must-have if you want to take pin sharp images in challenging lighting conditions. Then there is a quick guide to the types of lighting available rather than just relying on the pop-up flash built into your camera. Hopefully, these pages can help set you on the path to finding your perfect camera. ■

> **"For anyone looking to get a new camera, the choice available is actually quite overwhelming."**

The right camera for you

We highlight the main types of digital camera

The number of camera models available to the budding photographer is vast. All the main manufacturers have a large number of different models and types of camera to suit every taste and also every pocket. A wide variety of choice is fine but it can be somewhat overwhelming when it comes to choosing a camera for yourself. It isn't helped by the fact that the distinctions between various types of camera system have become quite blurred as the quality and the capabilities of these devices keep expanding. With that in mind, we have put together a little guide to the main types of camera out there. Hopefully it will help point you in the right direction so you get the right camera for the job. ■

> "A wide variety of choice is fine but it can be somewhat overwhelming when it comes to choosing a camera for yourself."

Compact Cameras

A large number of entry-level cameras fall into this category. They tend to be fairly small and light, measuring about 100 x 50 x 25mm and weighing around 120-130g. Modern compacts are normally fully automatic, although some may offer basic manual exposure options. They usually have a zoom lens of up to 12x which folds flush with the camera body and an LCD monitor of about 7cm diagonal size. Unlike larger camera systems, they don't have an optical viewfinder, relying instead on the LCD screen to be used as a live view monitor. Extra features may include HD video recording, image stabilisation and Wi-Fi connectivity, and they often come in a range of colours. As sensor technology has improved, it has also given rise to a range of compact cameras for the more advanced photographer. Sporting larger sensors, these offer greater image quality as well as superior versatility, manual controls and better low light capability. As you would imagine, these more advanced compact cameras can be significantly more expensive but they will give you much greater creative control than the standard models. These models typically offer 16MP - 24MP sensor sizes.

Superzoom

Superzoom cameras are a fixed-lens design of camera that are built to offer both wide angle capability and very large levels of magnification without the need to invest in additional lenses, as you would with a DSLR. In this case, the amount of magnification can be anywhere up to 60x or more. That is equivalent to a 1400mm super telephoto lens. This immense magnification means it can do the job of much more expensive DSLR cameras, that would require the purchase of telephoto lenses that could cost thousands, all in a relatively compact body. The downside to having a model of this kind is that although you can cover a huge zoom range from medium wide angle to super telephoto, that is all you can do. If you wanted to shoot a very shallow depth of field macro shot, for instance, you would not be able to do so; nor could you use a fast prime lens for low light shooting. That said, these superzooms offer image stabilisation, manual control, electronic viewfinders and HD video recording capability too. You can view these types of cameras as a great stepping stone for people who want to move up from compact cameras but don't want the extra expense of DSLRs and multiple lenses to worry about.

Mirrorless Cameras

This area of the camera system world has seen quite an increase in popularity in recent times. Essentially a mirrorless camera, as the name suggests, does not have the movable mirror seen in larger DSLR formats. Although you get a viewfinder as well as a rear mounted LCD screen, the image that you see is an electronic representation provided by the image sensor. Like the larger DSLR cameras, these devices have an interchangeable lens system, giving you greater creative control over any shooting conditions you might face. A mirrorless interchangeable lens camera (MILC) is smaller, lighter and less complex to build than most DSLRs. MILC systems usually offer around 20MP sensor sizes and although the quality of the images may not be up to full-frame DSLR standards, it is shown to be improving with each new camera that comes out. The price point and compact nature of this MILC system makes it a popular choice but be aware that lens choices are not as varied as those you would get with a standard DSLR. However, they do have a growing range of accessories such as flashguns. They have also become increasingly popular with filmmakers who love them for their good autofocus ability with HD and even Ultra HD video resolutions.

Adventure Cameras

This is another growth area in the camera market. Adventure cameras are compact cameras that are tougher than the average camera. If adventuring is your thing, then perhaps a large, heavy, expensive and relatively brittle DSLR might not be the most apt choice. Although DSLRs are touted as 'weather sealed' that won't protect them from a dunking in a muddy river or being dropped on some granite outcropping. This is where the adventure camera shines. A good adventure camera is fully waterproof and capable of going on a scuba dive down to 50ft. They are also shockproof, being able to shrug off a small drop onto a hard surface. Their sensors usually offer about 16MP resolution and plenty of shooting modes to make them useful as day-to-day cameras too. An offshoot of this area of photography has given rise to mini action cameras such as the GoPro range. They are the darlings of surfers, snowboarders and the like who want to be able to mount very small, very light cameras to their boards, or to themselves. Their ability to shoot 4K video also makes them very useful in the videography arena.

Camera Phones

There is no getting away from it, the smartphone has turned the idea of a point-and-shoot camera on its head. Smartphone imaging technology has come a long way and your average smartphone is now capable of shooting 16 megapixels with impressive low-light capability for such a compact device. Moreover, many smartphones now have the main camera backed up with a front-facing, lower resolution, 'selfie' cam as well. Typically, the camera built into a mobile phone is around 16MP with a small f/2.0 main lens and an 8MP front camera. They also have LEDs built in to act as a small flash unit to light your subjects at night as well as electronic image stabilisation. Camera phones are much simpler in design and use than standard DSLRs. Their smaller sensors and tiny lenses put an upper limit on image quality, although a few current models now allow the capture of images in Raw format as well as the more usual Jpeg format. Some models do boast larger 1" sensors that can rival the quality of some compact cameras. The main advantage of the camera phone is that it is built into a mobile phone; wherever you go, the camera goes too.

Digital SLRs

Digital SLRs, or DSLRs as they are commonly referred to, are cameras that use a mirror mechanism to reflect light from the lens up into a viewfinder. The viewfinder is optical, meaning that you are actually seeing what the lens sees, not an electronic representation like the LCD screens on compact cameras. When you take a photo, the mirror is flipped up out of the way and the light entering through the lens is allowed to fall onto the camera sensor and an image is recorded. DSLR's are generally heavier and more complex than mirrorless and compact cameras. DSLRs have interchangeable lenses and most can use the same lenses as their older film-based predecessors, giving you plenty of creative scope and lens choice. With specialist lenses available for particular tasks, DSLR systems are the choice of most serious amateur and professional photographers, offering superb image quality. Most DSLRs use a sensor size called APS-C but a few top-end cameras use the larger full-frame sensors that are the size of a 35mm film frame. The range of available lenses is vast, particularly with the main manufacturers. The downside is that DSLR bodies, lenses and accessories can be quite expensive.

What lenses do I need?

We take a look at the main lens types available for your camera

It's no surprise that if you purchase a new camera with an interchangeable lens system, one of the first questions you might ask yourself is 'which lens should I buy for my camera?'. That is not quite as easy a question to answer as you would hope. Manufacturers offer increasingly varied lenses to suit different photographers' requirements. To add to the confusion, there is also quite a varied range in price and quality to take into consideration. On top of that there is also the cropped sensor and full-frame issue to consider. Certain lenses will only work with certain camera bodies because of the mounting system used, and so on and on it goes. Everyone shoots differently, with a different style and preference and the type of shot you are trying to capture will also greatly influence the kind of lens you need. If you are a diehard landscape photographer, then lenses with a greater angle of view are what you will want to capture the environment in all its sweeping glory. If however, you are a portrait photographer, then your lens requirements will be quite different. It's a bit of a minefield but we'll try to break down the main types of lenses available as you look deeper into your next choice of lens. ■

> "If you are a diehard landscape photographer, then lenses with a greater angle of view are what you will want to capture the environment in all its sweeping glory."

Prime lens

A prime lens is a lens that is a fixed focal length. That means that it cannot zoom in or out, so you have to buy a prime lens with a focal length that suits your needs. Prime lenses are light and usually of better optical quality; but you will have to carry more of them to around cover a range of focal lengths. Although people might prefer the convenience of a zoom lens that covers a wide focal length range, the main factor in considering getting a couple of prime lenses in your gear bag, is that they offer models that have a very wide maximum aperture. Primes can be purchased with apertures of f/2.8 to f/1.4. This allows greater flexibility in low light conditions and also allows you to shoot images with very shallow depth of field for those lovely out of focus backgrounds.

Zoom lens

Zoom lenses have the advantage that they are more versatile than prime lenses. So much so that just a couple of lenses can cover a very wide range of focal lengths. You could for instance have a 16-35mm wide angle lens, a 24-105mm lens and a 100-400mm super telephoto and not need another lens for most of your shooting requirements. From a framing and composition standpoint, you do not have to physically move, you can simply zoom the lens to achieve the framing you are after. There are even certain zoom lenses that cover a focal length range of 18-300mm. For most practical requirements, you could use that one lens for every shoot you do. The main downside is that optical quality is often not as good as a prime lens and you will need to be aware of camera shake when using the longer focal lengths as any small amount of unwanted camera movement will be be magnified and potentially ruin your shots.

Pancake lens (prices range from £80 - £400)

Typical focal length:
Wide, Normal, Telephoto

Simply put, a pancake lens is a very flat prime lens. It is shorter than it is wide and very small and light. Photographers use them primarily when they are after a small, compact camera and lens system and are used with DSLR and Micro Four Thirds cameras. Relative to their diminutive size, they can produce very good images. Despite being a prime lens, they generally have a maximum aperture of no greater than f/2.8, although there are a couple of exceptions.

Standard zoom (prices range from £100- £800+)

Typical focal length:
24-105mm (full-frame equivalent)

This is the most common focal length, suitable for general photography and useful for everything from landscapes to portraits. Most systems will include a couple of lenses in this focal length range: usually a cheaper, slower version often included as a kit lens with a new camera, with a maximum aperture that is usually around f/3.5-f/4; and a premium quality lens often costing a lot more that may offer a maximum aperture of f/2.8-f3.5.

Ultra-wide zoom (prices range from £200 - £1500)

Typical focal length:
16-35mm (full-frame equivalent)

Ultra-wide zoom lenses are primarily used for landscape photography. They are more specialised than standard zooms, and consequently are usually more expensive, although some systems include both standard and premium types. A good quality wide-angle zoom can have a maximum aperture of f/2.8 but will be very expensive, whereas a lens with a similar focal length but with a maximum aperture of f/4 will be much cheaper.

Macro lens (prices range from £90 - £1500)

Typical focal length:
50-100mm (full-frame equivalent)

A true macro lens by definition should be able to record an image at 1:1 scale on the sensor or medium it was shot on at its closest focusing distance. This magnification factor means that a macro lens is able to fill the frame and reveal amazing detail on very small objects. Some of the more recent models have image stabilisation built in, to assist with camera shake that can potentially ruin a shot.

Medium zoom (prices range from £80- £1000)

Typical focal length:
70-300mm (full-frame equivalent)

The medium telephoto zoom is useful for amateur wildlife or sports photography and portraits at the shorter end of its focal length range. Telephoto zooms have a smaller effective aperture than standard zooms, usually ranging from f/3.5 to f/5.6. A decent 70-300mm lens can be purchased quite cheaply.

Tilt-shift (prices range from £100- £2500)

Typical focal length:
17mm 24mm 35mm (full-frame equivalent)

A tilt-shift lens is quite a rare breed and not many of its type are available. It is the modern equivalent of an old bellows film camera. The lens can be rotated relative to the sensor to control the position of the area of sharpest focus, as well as moved parallel to the sensor to move the image area.

Super telephoto (prices range from £800- £6000+)

Typical focal length:
400-1200mm (full-frame equivalent)

Specialist lenses are used mainly by professionals and advanced enthusiasts. These include both zoom and prime ultra-fast telephoto lenses used by sports and wildlife photographers. They are very expensive but essential when it comes to capturing action at some great distance.

Why do I need a tripod?

An essential piece of equipment

Camera ownership goes through a number of phases. First is the decision about which camera to actually buy, then comes the choice of lenses. Then come the choices with accessories. It may sound like an exaggeration, but one of the best accessories you can get to improve your photography, is to invest in a good tripod. In fact, it might be safer to upgrade it from the status of 'accessory' to 'essential purchase'. You might wonder why a tripod would be considered among one of the top key factors in taking better photographs.

Well, have you ever wanted to take photos in challenging low light conditions and wondered why your images are coming out blurry? Have you ever taken photos of some distant subject with your superzoom camera at its maximum magnification and wondered the same thing? This is because one of the primary causes of unsatisfactory photos is camera shake. Camera shake is the unwanted movement of camera and lens being caught during the capture of the shot. This translates as blurry photos, often blurry enough to ruin the shot completely. The tripod is instrumental in eliminating camera shake. It provides a very stable platform onto which you can mount your camera, preventing it from moving and spoiling your shots.

Tripods come in various makes, models and materials. They are either made from plastic in the cheaper models, to metal alloys in the mid range versions, all the way up to light but rigid carbon fibre in the professional models. As the name suggests, the tripod consists of a three legged arrangement upon which your camera sits in a tripod mount. The legs come in 2 or three sections and can be telescoped out to different heights. The tripod mount can be tilted, rotated and flipped so you can shoot at a wide variety of angles as well as in landscape or portrait orientation. Key factors when choosing a tripod are rigidity and carrying weight. The tripod you choose has to be able to support the weight of your camera and hold it perfectly still. Some cheaper tripods with plastic heads and thin aluminium legs are too 'bouncy' to be used with anything heavier than a compact or light superzoom. Set the tripod up and press down on the top of it. If it flexes by more than a few millimetres it's not going to be stiff enough to support the weight of a heavy camera. ■

Pocket tripods

These are miniature tripods designed for small compact cameras and are ideal for table-top use, or for positioning your camera for a self-timer group shot. They're small enough to slip into a jacket pocket or into your camera pouch. There are several different types, including ones with telescopic legs, ball or pan-tilt heads, and even flexible legs. One unique and extremely versatile design is the Gorillapod, which can grip onto almost any object or work as a tripod. If you want something even small to support your light compact camera, then the Xshot mini travel tripod is the one for you.

> "Tripods come in various makes, models and materials. They are either made from plastic in the cheaper models, to metal alloys in the mid range versions."

Entry level tripods

(prices range from £10- £50)

There are many cheap tripods on the market, made not only by brand name manufacturers but many third party manufacturers too. It's fair to say that the cheap tripods are cheap for a reason. If you are serious about your photography, particularly if you are shooting outdoors with a heavier DSLR, then you may find these a bit of a false economy. If they are made primarily from plastic, then they are not going to be rigid enough for any kind of long exposure photography, particularly when telescoped out to their full height. You would be better off spending a little more on a metal frame tripod.

Mid-range tripods

(prices range from £50- £250)

Often referred to as travel tripods, these are designed for general use where low weight and portability are important factors. It is a good compromise to use a mid-range metal tripod when you need to be mobile. They are made of lightweight materials, usually aluminium or carbon fibre and are suitable for most types of camera from compacts up to mid-range DSLRs, although not with large telephoto lenses. If you can, get one with a quick release plate that makes mounting and demounting your camera a much quicker process. The ability to lock the legs at different angles and fold in reverse for greater compactness and portability is important too.

Professional tripods

(prices range from £250 - £800+)

Top quality tripods are made from high-tech materials like carbon or basalt fibre, with magnesium alloy fittings and superior workmanship. They offer the best rigidity and support for even the heaviest cameras and lenses. They are going to be heavier than entry level or mid-range tripods but they offer quick release plates, different types of mounting platforms, variable angle legs and even the centre column can pivot in a wide arc. Although they are very expensive, you do get a lot of tripod for your money.

Monopods

(prices range from £40- £200)

If you want support for your camera but don't want the weight or bulk of a tripod, then a monopod is a good alternative. As the name implies, it is basically a one-legged tripod. Although not as stable as its three-legged cousin, the monopod can dramatically reduce camera shake. They can also be quite handy when shooting from a cramped space where the larger footprint of a normal tripod might inhibit your ability to shoot. Typically made from aluminium or carbon fibre, they provide helpful stability and also a good measure of portability.

Flashes and lighting

Add light and boost your creativity

Once you get beyond the basics of photography and you find yourself wanting to add a little creativity and take more control of how the light affects your shots, then that is when you need to take a look at additional lighting in the form of flashes. Your first experience of flash might be the tiny pop up flash you find on the top of a lot of compact cameras and a number of DSLR models. They are useful to light a subject when all else fails but to be honest, if you want your shots to look more than just selfies, then you need to look further afield. We are referring to the dedicated flashguns that can be mounted in your camera's hot shoe, or for even greater flexibility, used off-camera and fired remotely by a wireless trigger.

They are known by different names such as flash, strobe, speedlight (or speedlite) and monobloc. They are usually battery powered, which makes them very portable. They emit a powerful and brief flash of light that can illuminate your scene. Monoblocs, or studio lights as they are know, are larger, more powerful and less portable lights that are usually powered by mains electricity. Some studio lights can be used outdoors with the help of large lithium batteries. ■

Pop up flash

Most compact cameras and entry level DSLRs will have a small flash built in. Most are designed to pop up when light levels are deemed too low to get a usable exposure. Pop up flashes by their nature are very small and produce a very harsh direct light that is not flattering for your subjects. Because the little flash tube is front-facing, you don't have a lot of scope to get creative. You can use it to fill in dark shadows but beyond that you're probably going to struggle. Some people will put a small piece of white card bent at an angle in front of the flash to direct the light upwards in order to bounce the light off the ceiling but this can be a bit hit and miss. Add to that the fact that they are not particularly powerful, then you can see why you need to step up your game a little to the next level.

Continuous light (prices range from £50- £10000+)

An alternative to the various forms of flash lighting we've mentioned here is to use continuous lighting instead. Sometimes also referred to as hot lights or photofloods. Rather than emitting a powerful but brief flash of light, continuous lights are always on. They are not as powerful as flashes but you do have the benefit of always seeing how the light is falling on your subject without needing to do a test shot as you would with flash. At their simplest, they are either an incandescent bulb housed inside a large reflector, or powerful daylight balanced fluorescent lights that are more energy efficient.

For more powerful options, you are going to be looking at arc lights; these were developed for the film industry and are insanely expensive.

Third party flash (prices range from £25- £150)

Just like cameras, there is a bewildering choice. Not just from the major brands like Canon and Nikon but from 3rd party manufacturers like Nissin, Yongnuo and Gloxy. With big name brands costing hundreds for top of the range equipment, the temptation may be to trawl the pages on eBay looking for a bargain flash unit. It is fair to point out that the phrase 'you get what you pay for' has never been more relevant.

You may find yourself some unknown brand for a quarter of the price of one of the major brand names that seems too good to be true, and it probably is. Take the advice of those who found out to their cost, stick with a major brand or well-regarded 3rd party manufacturer. Check out user reviews wherever you can. Make the best informed choice you are able within your budget.

Brand name flashes (prices range from £100- £600)

All the manufacturers make a variety of flash models for their cameras. They range from simple front facing small flashes, right up to their professional-level flashes with wireless control, powerful flash tubes with variable power control, tilt and swivel flash heads and a host of customisable features and accessories to create your own portable studio setup. These models are not cheap but they are the choice of professionals for a reason. They also have the added bonus of letting you shoot high-speed photography because, when used at lower power settings, the pulse of light from the flash is so brief that you could use it to illuminate a scene for a fraction of a second and catch a bullet in flight, freezing the action dead in its tracks.

Studio lights (prices range from £150- £4000+)

Studio lights can actually be broken down into two categories. First is the flash head kit. Flash heads are just the light emitters. A separate power pack supplies the required voltage and the controls are actually on the power unit itself. The other variety of studio light is the monobloc, or monolight. These are either mains powered or lithium battery powered flash units but all the controls are built into each unit. This limits their power but it does make them more portable and more easily used outdoors. Flash heads tend to be more powerful and you have the advantage of being able to control multiple flash head setups directly from the power pack.

Photography software

How to bring your photos to life

Back in the days of analogue film cameras, the process of taking photographs used to be the key part of the creative workflow. Producing prints or negatives in the darkroom did not allow for much scope when it came to maximising the quality of the images that had been taken. These days, in the world of digital photography, it can be argued that the capture of the images is only half the workflow. Indeed, some regard the post-process workflow as the overriding factor in producing great images.

We have always extolled the virtues of shooting your images in the uncompressed and unprocessed Raw format. Raw files are so named because they only contain the raw data straight from your camera's sensor; There has been no processing of the image as you would get with a Jpeg file. However it does mean that you have to put in a little work to extract the very best from the Raw format. This is where you need some software that can process your photos. Using Raw processing software is the first step in the workflow. Here you can make all the necessary basic edits to your images such as distortion correction, saturation, tonal adjustments, sharpening, noise reduction and so on. Once you have made all the main edits to your photo, you can save it out to your preferred image format such as Jpeg or Tiff and call it done. However, if you want to do some additional photo manipulation, then you will also need to invest in software that can let you apply extensive photo retouching, layers, masks and effects.

When it comes to software, you have a large number of options from which to choose. In fact, there is so much choice, it can be nothing short of confusing. If you are new to photography or even an experienced photographer looking for some new applications to take your images to the next level, we've produced a small overview of some of the software options currently available. Note, that from the list, Adobe products feature quite prominently. That is no accident as their popularity cannot be denied, but there are also more options to discover. ■

> **"These days, in the world of digital photography, it can be argued that the capture of the images is only half the workflow."**

Adobe Photoshop CC

(Windows and Mac - £120 annual subscription)

Photoshop is probably one of the best known editing programs out there; so much so that the name of the software has actually become a verb, as in 'that image has been Photoshopped'. The great thing about Photoshop is that it is relatively easy to use, if you only need to bring the simplest tools to bear on your images, but it is also hugely sophisticated if you require the most advanced editing tools available. It is the go-to application not only for photographers but digital artists, designers and even videographers and 3D artists. It is probably the most popular layer-based image editing and photo retouching software currently available. Photoshop is now available as part of Adobe's Creative Cloud subscription service.

ACDSee Photo Studio Ultimate 2019

(Windows - £70 one-time charge)

ACDSee has actually been around for some time now and can be considered a competent alternative to both Photoshop and Lightroom. From its humble beginnings, this high-end version of the software has developed into a fully featured image management tool, Raw processor and image manipulation program. Anyone who has used Lightroom will note that ACDSee has a number of different workspace environments. Each workspace has a specific function and each can be activated and accessed easily, producing an efficient one-stop workflow experience. You can use the Manage mode to find and catalogue your photos, then jump into the Develop mode and process your images, before diving straight into Edit mode to manipulate your photo with some extensive editing tools.

Adobe Photoshop Lightroom Classic CC

(Windows and Mac - £120 annual subscription)

Lightroom Classic is an image processing and photo organiser that allows the organising, non-destructive enhancement and retouching of images in large numbers. It is a very powerful program that not only sets the standard for image enhancement but also for its ability to organise, catalogue and add keywords to all the images in your library. It also boasts the capability to create photobooks, print parameters such as layout and orientation and can produce web galleries for websites with a number of display templates provided for easy styling.

Luminar 3

(Windows and Mac - £65)

Another powerful all-in-one option for photographers and digital professionals is Luminar 3. This is another example of a hybrid Raw processing program, image management system and layer-based image editor. Luminar 3 is being touted as a strong contender in the growing list of applications trying to topple Photoshop and Lightroom from the top spot. Luminar 3 has a number of workspaces from which you can choose, or even create your own custom workspace to suit your workflow process. The benefits of this mean that, unlike Lightroom where you might make a series of global adjustments and then save the image and work on it in Photoshop for more targeted edits, Luminar 3 lets you do all of that under one roof.

Affinity Photo

(Windows and Mac - £50)

Created by Serif, Affinity Photo is a raster image editor very much in the same vein as Photoshop. It allows the creation of multi-layered compositions and has a varied toolset for graphics professionals and photographers alike. Amongst its arsenal of tools and features is the ability to edit Raw images, create stitched panoramic photos, retouch photos and make other non-destructive adjustments. It can also import and export to the Photoshop PSD format, and is compatible across iOS and Windows.

Corel Paint Shop Pro 2019

(Windows - £55)

Corel Paint Shop Pro pulls off a great trick by being several programs in one package. You are able to use its file management capabilities to tag, rate and keyword your images. Then, you can move to the edit suite and process your images and make all the main enhancements and image adjustments that your image needs; there are also a number of preset art filters, similar to those you find on apps for your mobile phone. Then you can move to the edit suite and use the layer-based editing that makes it a worthy alternative to Photoshop.

USING YOUR CAMERA

Master your camera and learn how to get the most out of it

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38 ISO and image noise

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Photography is built around some basic principles that a lot of casual photographers might not encounter if they shoot fully automatic with their cameras. In full auto, all the decision making is done by the camera and you are there only to push the shutter button to take the picture. As good as modern cameras are, they are not perfect and you may find that the shots you are trying to get don't come out the way you expect. This is where taking more control of your camera is essential to improving the scope of your creativity as a photographer.

In order to do that, you need a basic grounding in the main aspects of photography such as how shutter speed affects your shots and what your choice of aperture means for the look and sharpness of your photos. Understanding the main techniques is a gateway to much more creative and fulfilling photography that can elevate your photos from simple snaps to the kind of images that can rival the pros. Those techniques aren't some dark art known only to a few, they are quite easy to get to grips with and in this next section we will look at the core principles of photography more closely. ■

"This is where taking more control of your camera is essential to improving the scope of your creativity as a photographer."

The addition of elements in a scene can make or break a photograph. If you did not have the tree on the lower left of the shot, would the shot seem unbalanced or incomplete without it?

Basic composition

The simple rules that make a good picture great

The main difference between a well taken snapshot and a truly artistic photograph is simply a matter of composition. By changing the focal length, the angle and the position of the camera, the photographer can change the relative positions and sizes of objects in the frame to produce a more visually pleasing effect. Learning to do this is mostly a matter of practice and experimentation, but there are a number of simple tips and rules-of-thumb that can help you to take better pictures.

The first and most important thing to remember is to take your time. Look at the scene in the viewfinder or on your monitor and try to see it not as simply a view but instead to imagine it as a finished print. Ask yourself if there's any way that it can be improved by maybe zooming in a little, or by moving the camera. A tripod is a very useful tool for this, since it lets you view a completely static image without the need to hold the camera steady.

The Rule of Thirds

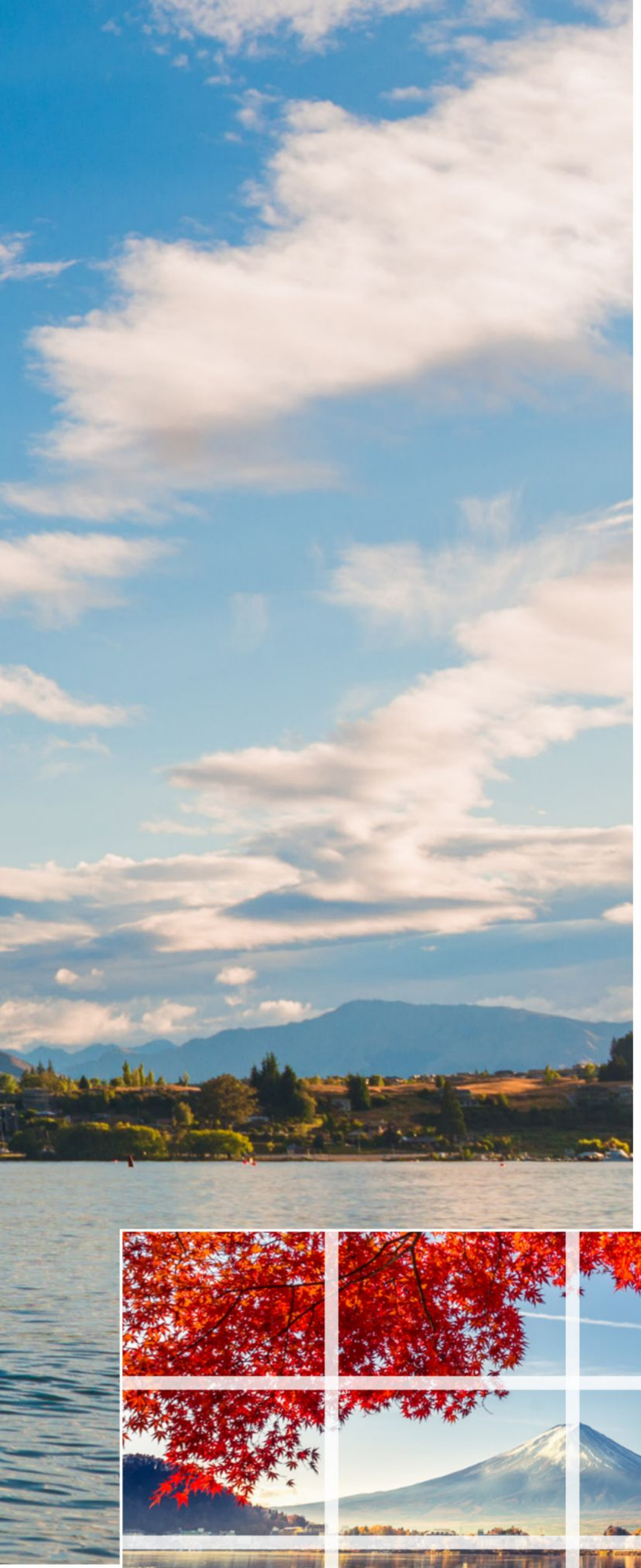
The most commonly used compositional technique is called the Rule of Thirds, and it's really very simple. Let's take a look at an example landscape picture [1]. It's a great shot, correctly exposed, in focus and nicely lit, but now look at the next example [2]. Doesn't that look better? It's obviously the same scene, and taken from roughly the same position, but this composition is much more appealing. The reason it works is because the mountain is now positioned off-centre in the frame, in fact it is one third of the distance from the right to the left. This type of composition is known as the Rule of Thirds.

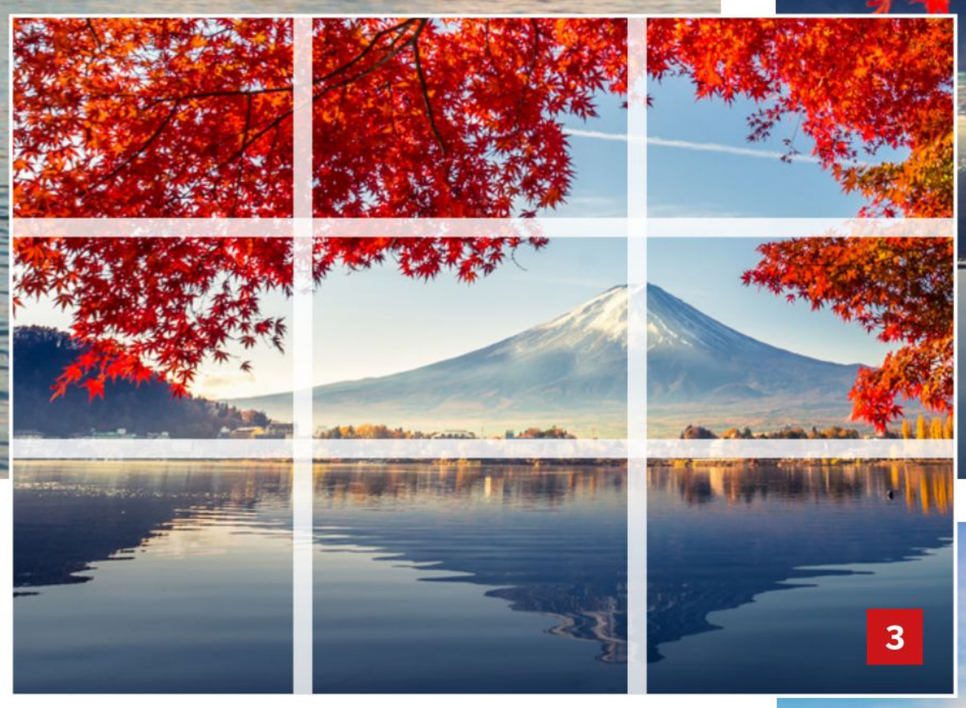
The best way to apply the Rule of Thirds is to imagine the frame divided up into thirds both vertically and horizontally, rather like a Noughts and Crosses (Tic Tac Toe for those in the USA) grid [3]. If you position the main elements of the image on these imaginary lines, or better yet on the intersections where the lines meet, you'll find that your image will look a lot more pleasing to the eye.

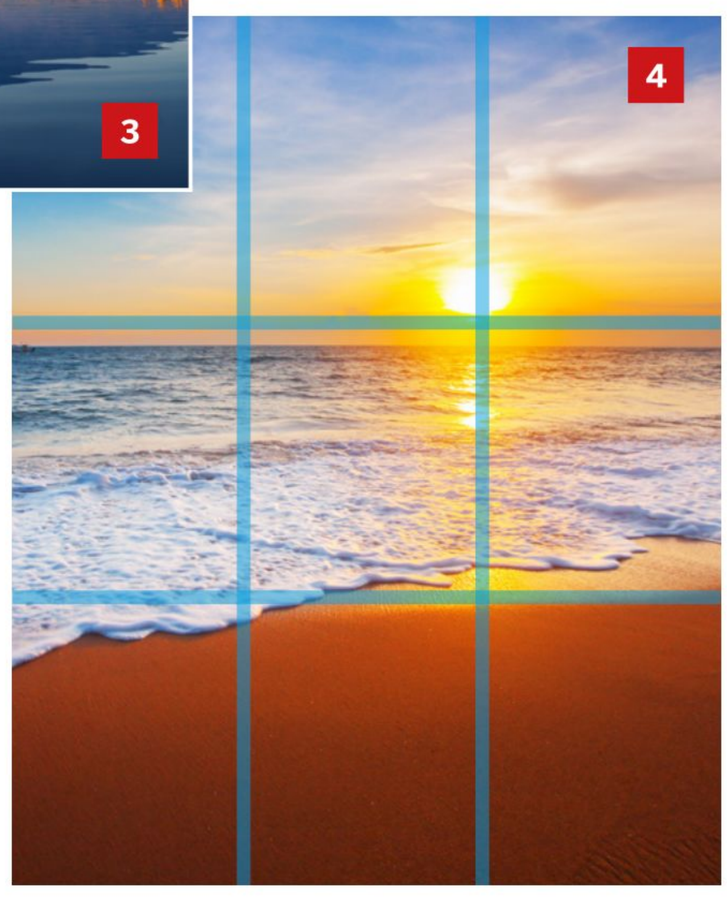
The Rule of Thirds works just as well in vertical-format shots, and is useful in landscape photography, since features on the horizon makes a natural dividing line [4].

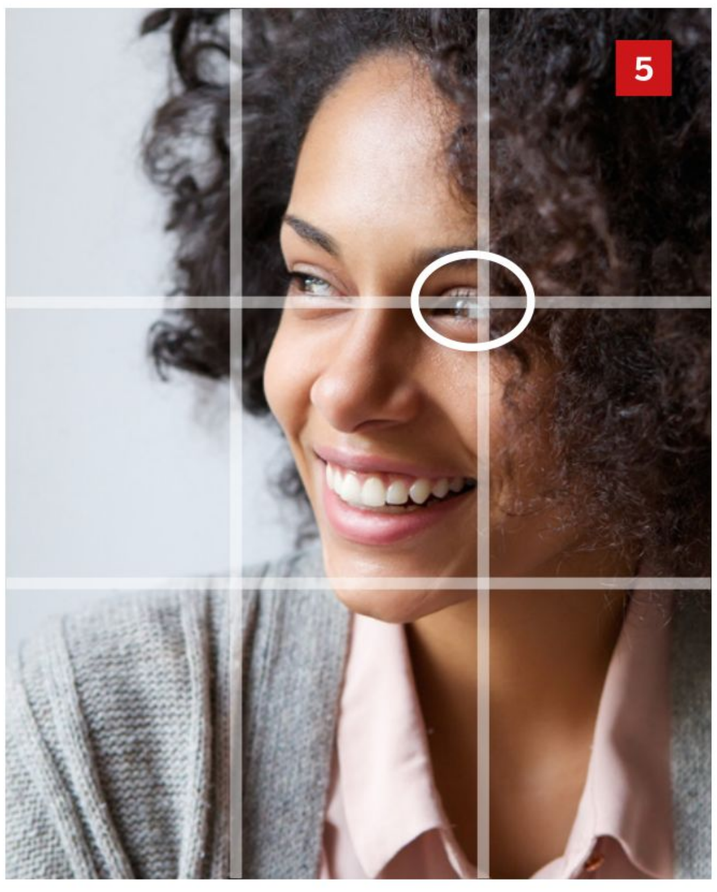
Portraits can also benefit from Rule of Thirds composition. Positioning a subject's eye at a point where the imaginary lines intersect [5], will give your portrait balance and really help to draw the viewer's attention into the picture.

Most digital cameras feature an option to superimpose the Rule of Thirds grid on the monitor screen to make this type of composition easier. Now you know why it is there. ■









"Look at the scene in the viewfinder or on your monitor and try to see it not as simply a view but instead to imagine it as a finished print."

ZOOM

You can use your camera's zoom lens to improve composition. Below (left) is a photograph of a striking evening scene, taken with a 16mm wide-angle lens.

Whilst it does capture a striking skyline with interesting visual content, there's too much going on in the picture. The jetty in the foreground, the buildings both sides of the river and the bridge are confusing, so it becomes unclear what the subject of the shot is.

By moving a short distance and zooming in to exclude the surrounding scenery, we can get a much tighter composition (below right). Now there's no question about the subject of the photograph. The shape of the building where it intersects the sky and the river now conforms to the rule of thirds.

> "By moving a short distance and zooming in, we can get a much tighter composition."

FRAMING

A less popular technique, but one which can produce good results under the right circumstances, is framing. This is where you use objects in the foreground to frame and thus emphasise the main subject of the picture. It is difficult to do well, because there is the risk that the foreground objects will distract the viewer from the main subject. However if the framing objects are sufficiently nondescript and contrast from an eye-catching main subject then this compositional technique can work very well.

In the picture on the left the framing doesn't work because too much of the foreground is visible and in sharp focus; it distracts from the subject of the picture. However, framing an image by zooming in so that only a few leaves are visible and out of focus, the effect in the right image is a lot more successful.

Thanks to the conventions reinforced by decades of Hollywood films, framed shots where most of the framing object is on the lower edge of the frame tend to look sinister, like you were stalking the subject, while a frame of overhanging foliage tends to be associated with romance, and is often used by wedding photographers.

Angle

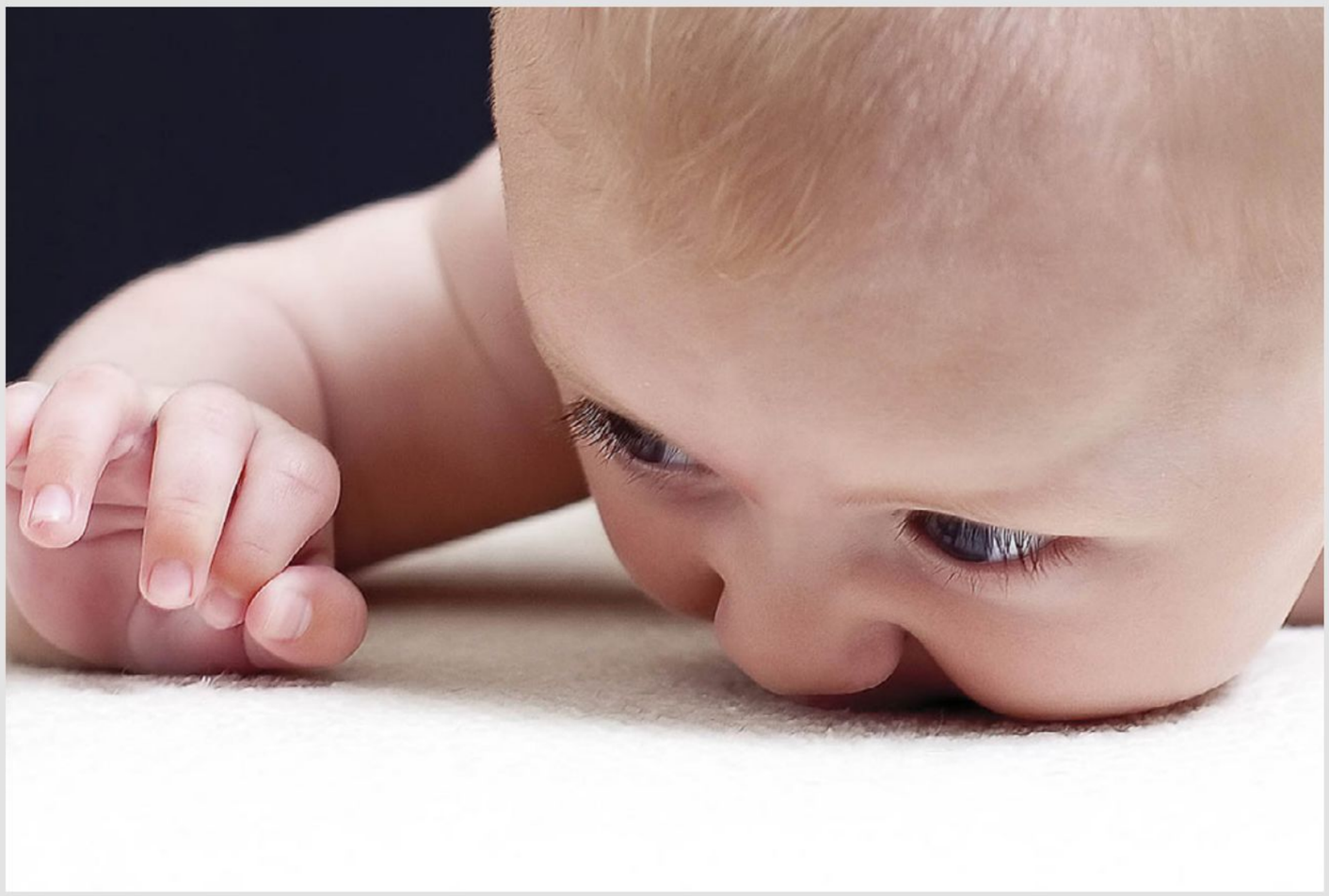
By far the most common compositional mistake is to take a photo from the wrong angle. If you see something that you think might make a good photo, don't just point the camera and snap away. Pause for a moment and think about what you actually want to see in the picture, and what would be the best way to capture it. Take this shot for example:

This display of fruit and veg outside a greengrocers has some good elements. The light is great, it has plenty of colour, and some interesting shapes and textures. However shot from this

angle it is completely uninteresting, just a random snapshot. However if we get down lower and in closer, we find this view:

It would have been better still to have the strawberries in the shot as well, but here the contrast in shape and colour between the melons and the pineapple stalks makes for a much more striking image, and the slightly blurred price tag in the background adds a nice finishing touch.

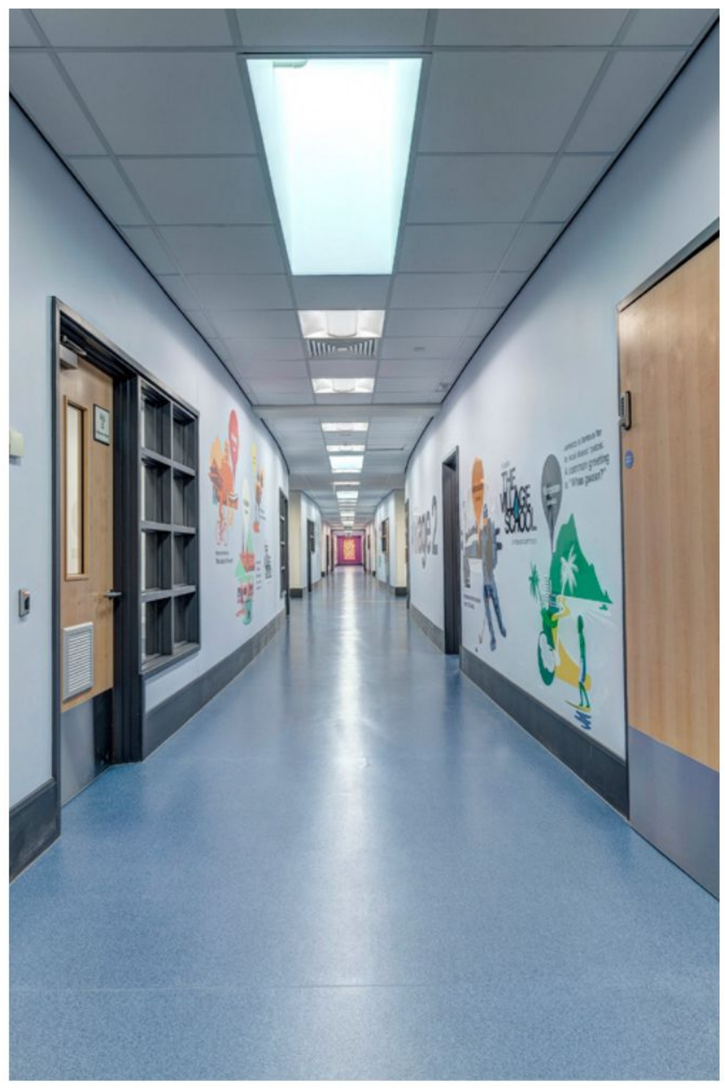
One of the best uses for this tip is when taking photos of children or animals. If you kneel down and shoot from their height you'll get much better results than if you stand up and just snap away, because all you get then is photos of the tops of their heads. The best wildlife photographers know that to get a good picture of an animal you have to share its environment, so make a bit of an effort and try to get down closer to you subject's head height. You may risk getting your clothes dirty, but you'll get a much better shot.



When shooting children or animals, capture the world from their perspective by crouching down so that the camera is level with their head height.

Perspective

Perspective is what gives us our perception of three dimensions, and we can use this to achieve a number of different effects. Most types of perspective shots are achieved using wide-angle lenses, since the exaggerated angle of view emphasises the effect. The most common type of perspective effect is "one-point perspective". By using a wide-angle lens, groups of lines converging on a vanishing point within the boundaries of the frame can add energy



to an otherwise fairly dull scene, giving a sense of movement and drama. This effect works best for photographs taken when within or surrounded by buildings, but it can also work on roads, railway lines, even rivers and beaches.

Photographs of buildings can be enlivened by using "two point perspective", photographing the building from a low angle pointing upward so that the parallel sides converge both upward and to the side, creating two vanishing points which are usually outside of the frame of the picture. This is also achieved by using a wide-angle lens to emphasise the effect, however the main danger is that many wide-angle lenses, especially the zoom lenses on compact cameras, produce what is known as barrel distortion, where parallel lines appear to curve. Better quality lenses minimise this distortion. ■

FOREGROUND, SUBJECT AND BACKGROUND

Squinting at your subject through the viewfinder of your camera, it's all too easy to overlook what else is in the frame. You're concentrating so hard on getting your subject not to blink when the flash goes off that you completely miss that tree in the background that looks like it's growing out of her head, or the discarded crisp packet lying distractingly in the corner of the frame.

Along with your main subject, a photograph will usually have both a background and a foreground, and these are just as much a part of the image. The trick is to compose the photograph in such a way that you strike a balance between these different elements. When done properly this adds life and interest to the picture, as well as making it seem more natural.

Take this photo of a famous and much-photographed Dartmoor landmark, the ancient clapper bridge at Postbridge in Devon. It's very easy to simply take a snapshot of the bridge, but that simply looks the same as the photographs that hundreds of visitors take of it every year. It's very pretty, but it's also a little dull. By including some foreground detail, and positioning the camera to capture the background of the moorland and forest, the bridge is now one element of a much more balanced shot, and one which shows the bridge in its surroundings.

Similarly this photo of a familiar London landmark is flat and boring, and doesn't really show the building in the context of the city around it.

By choosing a completely different location we can add foreground detail the shot, and instantly it becomes more balanced and dynamic. Of course the improved weather helps too, but that's another thing to which you should pay attention when you are setting up and composing a photograph.

Balance

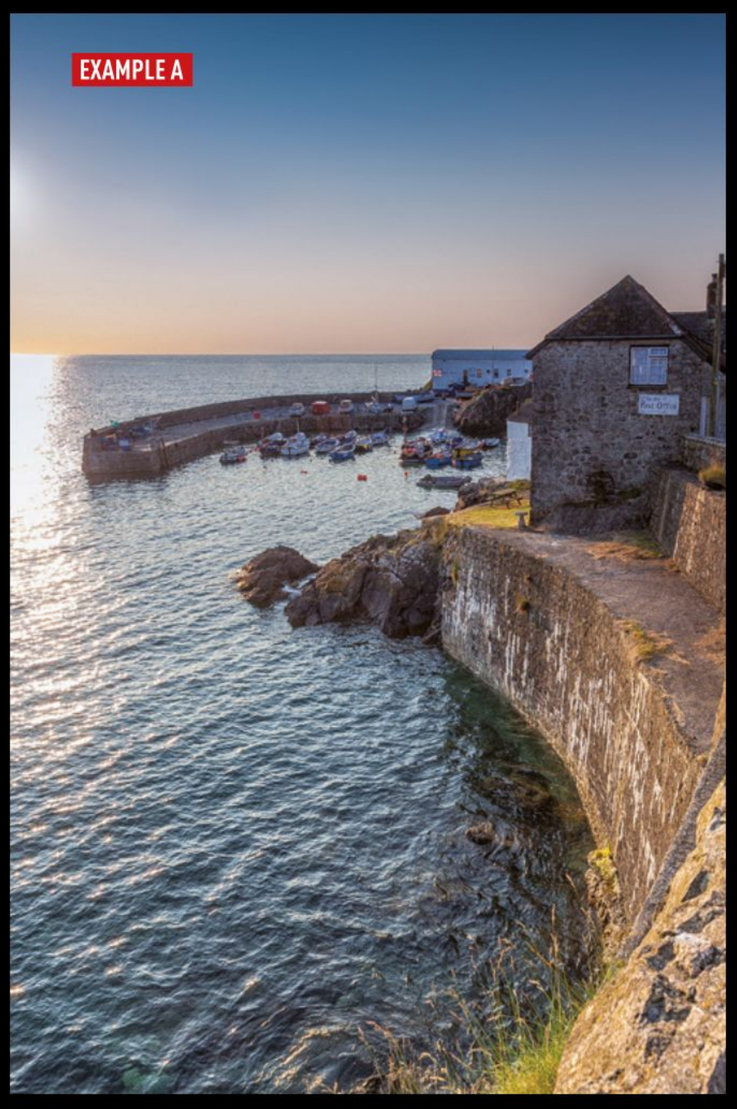
When your photograph has more than one subject you can achieve a better composition if you give each subject equal weight in the composition, so that the subjects form a harmonious balance within the frame. As with many artistic techniques it's largely a matter of practice, experience and individual taste.

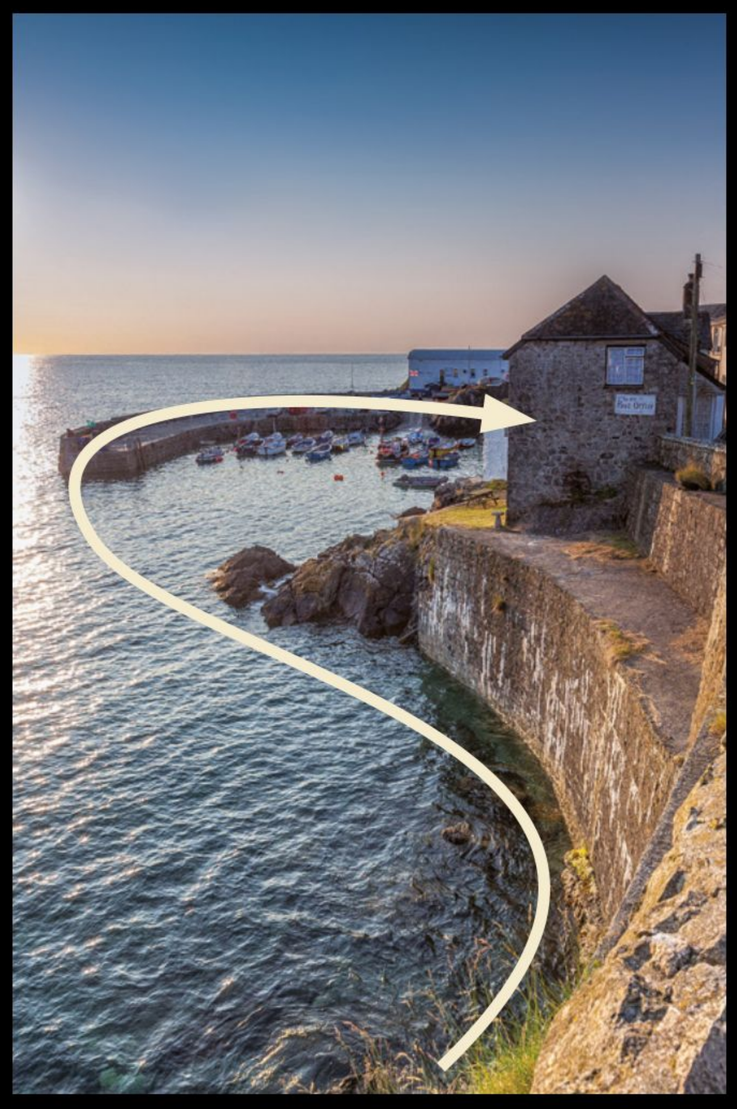
Try to position your subjects so that they are the same distance from the edges of the frame, and also more-or-less symmetrically balanced around either the centre of the frame or some visible dividing line. A diagonal composition works in most cases, especially with portraits of couples. Perfectly symmetrical arrangements where the subjects are the same height within the frame tend to look forced and unnatural.

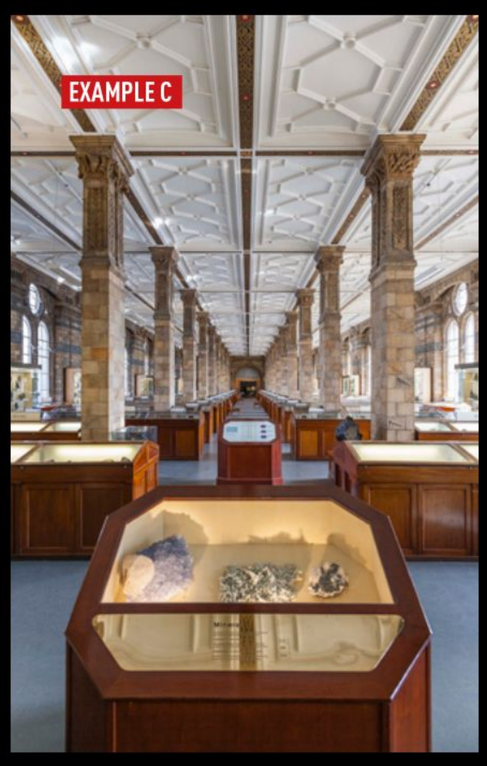
In this first example, the two fish are balanced by the stone jar in a diagonal arrangement that makes for a pleasing and harmonious composition. If you can't see it, try covering up the jar with your hand and see how dull the fish look on their own.

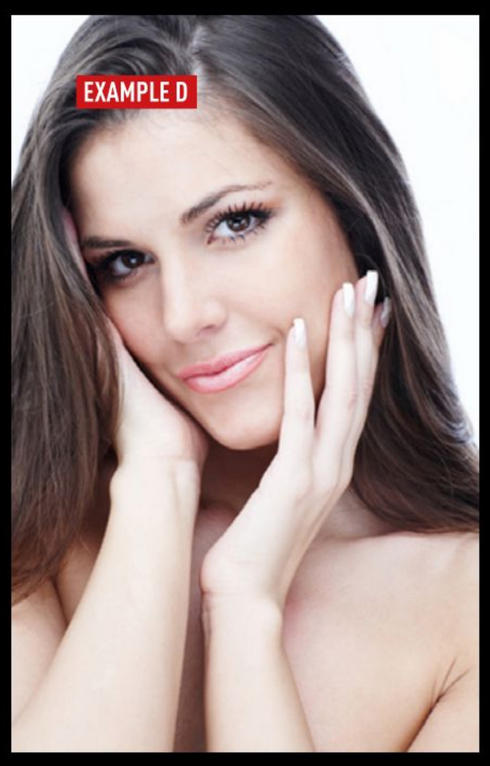
In this second example, the photo was cropped to balance the composition between the two guys talking in the background and the horse in the foreground. In this case the horse is closer to the edge of the frame, but then it is much bigger and closer to the camera, so it looks more natural that way.

LEADING LINES









Closely related to perspective is the concept of leading lines. When you look at a photograph for the first time, your eye will naturally be drawn to certain areas. It is possible to subtly lead the viewer's eye around the image to areas of interest using the visual cues of line and perspective.

For some reason best known to anthropologists our eyes find broad "S" shapes very appealing, so any feature in a photograph that resembles this shape will naturally tend to attract the viewer's attention. The eye naturally tends to follow the S-shape into the picture, usually starting at the closest and/or lowest point and moving upward. Many features can be used to create leading lines, but favourites include rivers, streams, footpaths, roads, hedgerows, or the line of surf on a beach. In figure or portrait photography, the line of the limbs, hands, hair or items of clothing can also be used to create leading lines that draw the eye into the photo.

In example A, the elevated angle allows the long curving line of a harbour wall to form a leading line drawing the viewer into the picture. Leading lines are most often used in landscape photography, because so many natural features make those appealing S-shapes. In example B the line of the path leads the eye up past the hikers to the mountains beyond.

Leading lines don't have to be S-shaped curves, straight lines can work as well. In example C, the perspective of the walls, the ceiling decorations and pillars draw you from the front of the shot down the corridor to the exit. Use leading lines to emphasise a particular point in a photograph, or to highlight a particular subject in a busy environment.

In this studio portrait shot (example D), the position of the model's hand and the line of her hair combine in a leading line directing the viewer's attention to her eyes.

Implied movement

A photograph freezes a moment in time, which is great if your subject is a stationary object or person, but what if your subject is moving? How can you capture movement in a still image?

There is a technique involving a slow shutter speed and panning the camera to follow the movement, but it's difficult to master and only works about one time in ten anyway. Far easier is freezing the action with a nice fast shutter speed, and using a subtle compositional trick to simulate movement.

The trick is very simple. Just position the moving subject within the frame so that it appears that it is moving into the middle of the picture. For example, if you are photographing a boat moving from the left to the right, position it on the left of the frame so that it is moving inward towards the centre, leaving room in the frame into which the boat could move. The best way to illustrate this effect is with a couple of examples. Take a look at this shot:

Here the boat is positioned incorrectly, and appears to be about to exit out of the picture.

There is a lot of empty space on the left of the picture, and it looks awkward and unbalanced.

In this shot, the boat is moving into the picture, giving it better balance and a dynamic feeling of speed and movement. If you look at

pictures by professional sports photographers, you'll see this technique applied to everything from sailing boats to football players. ■

"The wider the range of available shutter speeds, the greater the creative versatility of the camera."

Shutter speed and camera shake

The shutter of your camera is simply a mechanical barrier

The shutter of your camera is simply a mechanical barrier that prevents light from entering the camera until it is needed, controlling when and for how long light is allowed in to expose the sensor. The latest digital cameras have high-speed electro-mechanical shutters capable of timing exposures with an accuracy measured in fractions of a millisecond.

Along with the aperture setting and the sensitivity control, shutter speed is one of the three ways that photographic exposure is adjusted. When a picture is taken, the shutter is opened for a precisely measured amount of time allowing light to pass through. The duration of the exposure is set either automatically by the camera's light meter or manually by the photographer. The wider the range of available shutter speeds, the greater the creative versatility of the camera.

Modern digital SLR cameras have a very wide range of shutter speeds available, usually ranging from 30 seconds to as high as 1/8,000th of a second, and most also have a 'B' setting, in which the shutter stays open for as long as the shutter release is held down. The 'B' is from bulb. Very old cameras commonly used an air-bulb attachment as a remote shutter release.

Shutter speed can be manually adjusted in either full manual exposure mode or in shutter priority mode, the latter usually denoted by an 'S' or 'Tv' on the exposure mode dial. Shutter priority is a semi-automatic exposure mode in which the photographer sets the desired shutter speed, and the camera's exposure system adjusts the aperture accordingly to produce the correct exposure.

In automatic and program exposure modes the camera will set both the shutter speed and aperture automatically. Under normal daylight conditions, the shutter speed will usually be set to between 1/125th and 1/1000th of a second, since this is fast enough to freeze most movement and to reduce the effects of camera shake. However in low light conditions the camera may set a slower shutter speed, and with this comes an increased risk of movement blur caused by camera shake. Most cameras will display some sort of warning if this occurs. ■

AVOIDING CAMERA SHAKE

When shooting hand-held and wishing to avoid camera shake, as a rule of thumb you can safely use a shutter speed roughly equivalent to the reciprocal of the focal length you are using. For example if you're using a 100mm focal length then you can take a sharp hand-held shot at a shutter speed of 1/100th of a second or faster. If you're using a 35mm focal length then 1/35th of a second is safe, and so on.

Here's an example shot taken hand-held at a focal length of 100mm and a shutter speed of 1/100th of a second. As you can see it's sharp and shake free.

Here's the same hand-held shot but this time with a shutter speed of 1/10th of a second. At this speed and focal length it's much more difficult to hold the camera steady. As you can see, the result is quite blurred.

Many modern cameras include technology which can reduce the effects of camera shake at low shutter speeds. Many compact cameras use electronic processing to counteract movement, which does work but produces relatively poor image quality. Among digital SLR and CSC manufacturers there are two types of image stabilisation in common use. Canon, Nikon and Panasonic favour optical stabilisation, where elements within the camera lens are moved to counteract camera shake. Other brands including Pentax and Sony employ a system which moves the camera's sensor to achieve the same effect.

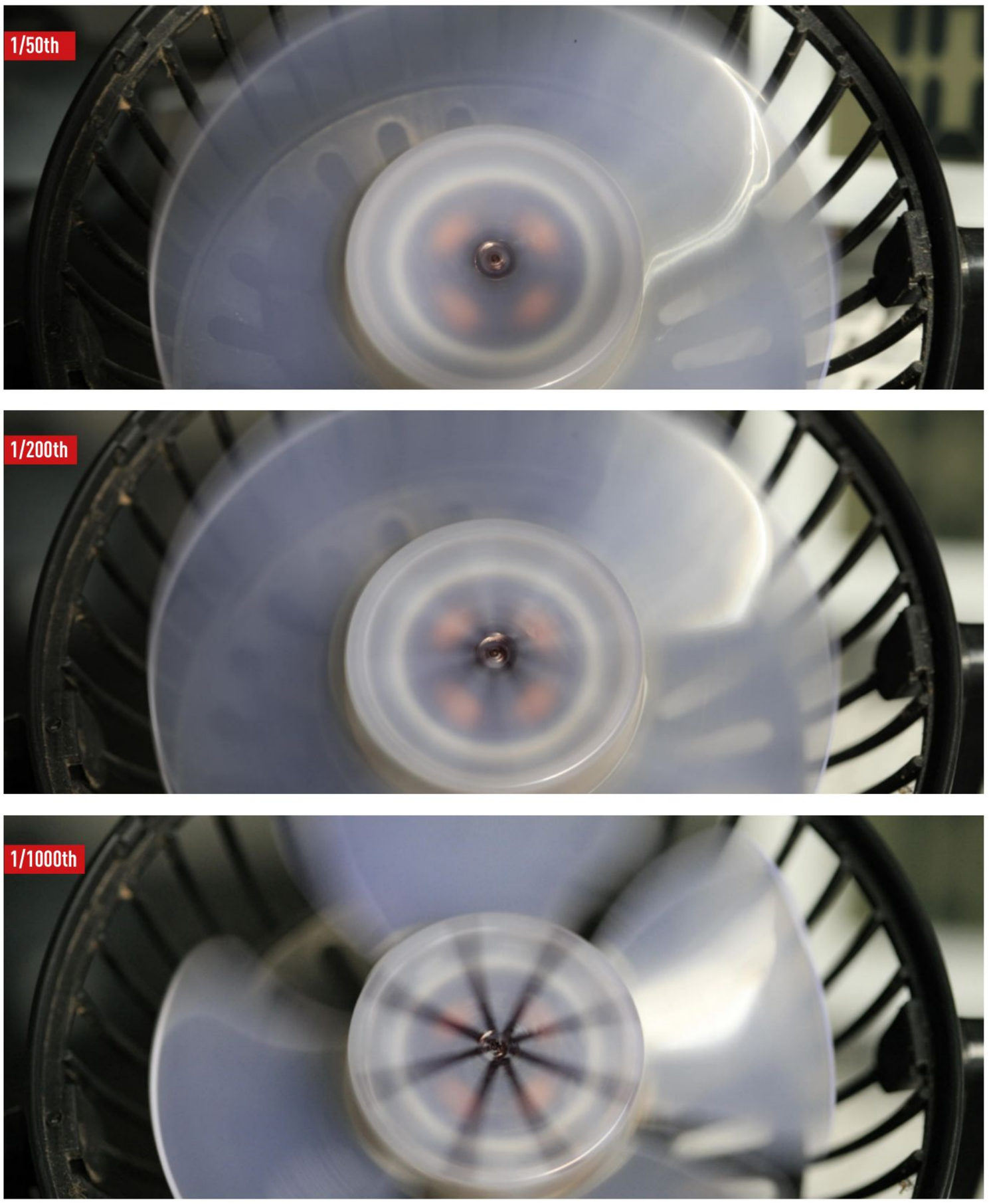
There is no clear advantage between moving-lens and moving-sensor systems. Modern image stabilisation systems of both types can provide around three or four stops of additional stability, however the sensor-shift method has an advantage for SLR users because the non-stabilised lenses are usually considerably lighter and are often also cheaper to buy, since the complex anti-shake system is built into the camera body. It also means that photographers using older predigital lenses can still have the advantage of image stabilisation.

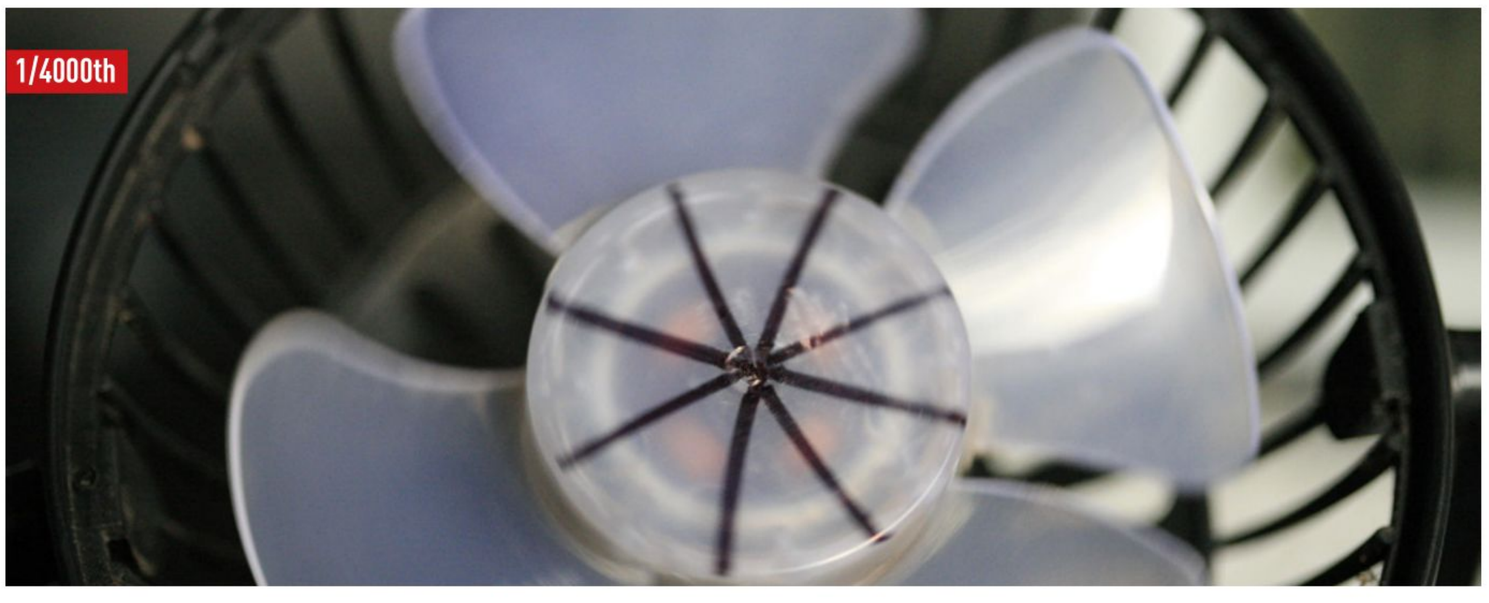
This example shot was taken with a focal length of 100mm at 1/10th of a second as before, but this time the image stabilisation (in this case a sensor-shift system) is switched on. It has detected the vibration and corrected it by moving the sensor to compensate, resulting in a much sharper shot.

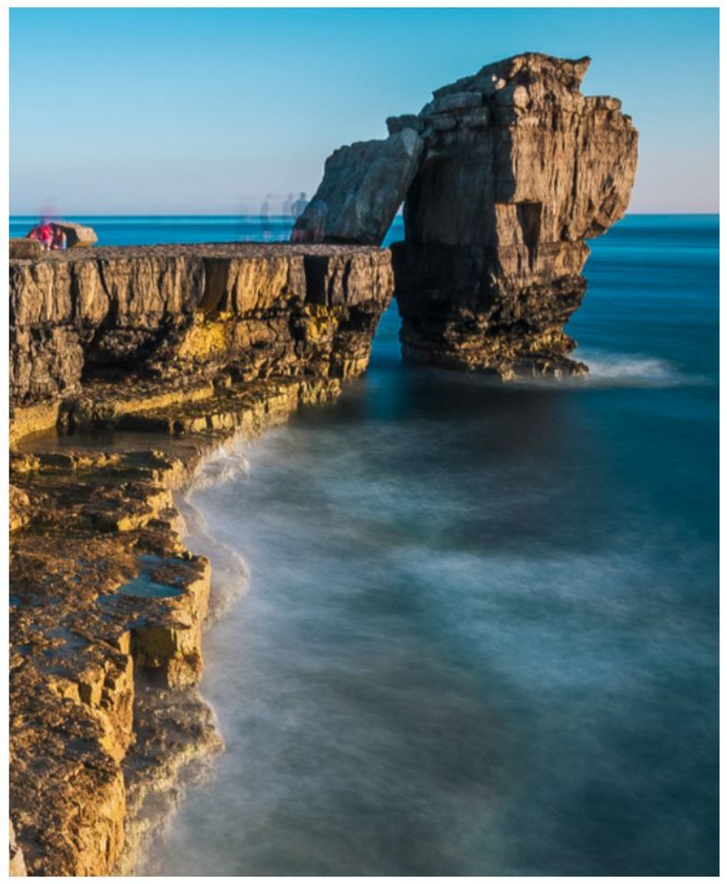
MOTION BLUR

Any movement in the frame during the exposure will be captured in the picture, resulting in motion blur. Anti-shake systems can do nothing to correct this; the only solution is to use a shutter speed fast enough to effectively freeze the action and eliminate any sense of motion. With a fast enough shutter speed you can freeze even very fast-moving objects, as this next sequence of photos will show. They were taken at shutter speeds ranging from a fairly slow 1/50th of a second up to 1/4000th of a second.

As you can see, at 1/4000th of a second the blades of a desk fan can almost be frozen in place.



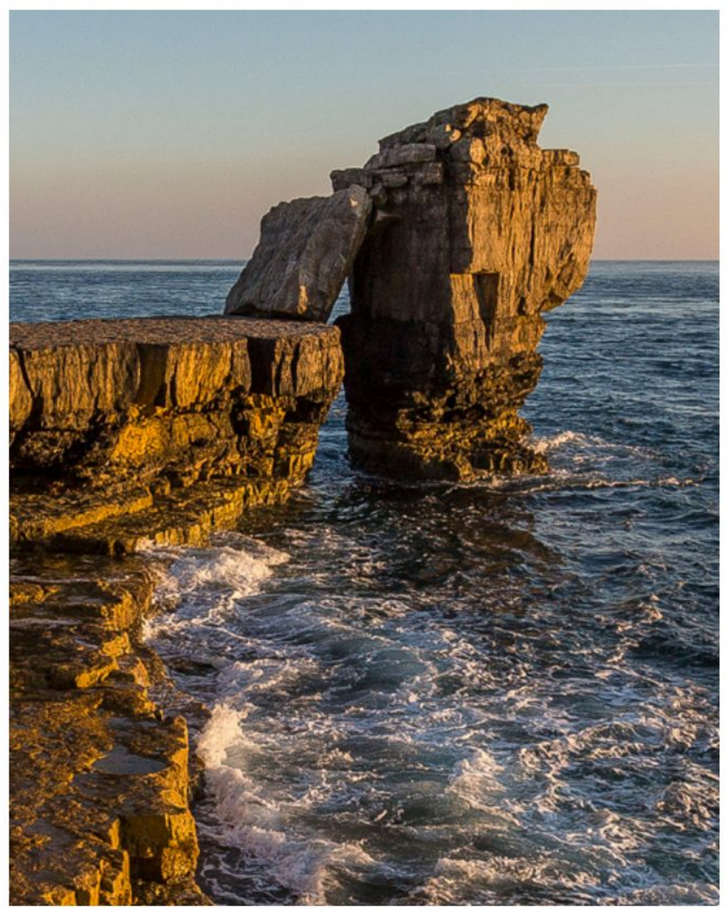




THE MISTY WATER EFFECT

One of the most effective uses of long shutter speed is photographing flowing water. It's a beautiful if slightly over-used effect, but it is very easy to achieve. Any moving body of water, flowing stream or waterfall will do, as long as it has white splashing water. This scene is Pulpit Rock in Weymouth.

If you just point the camera and shoot on automatic, you'll end up with something like this (below). It looks nice enough, but it's a bit dull. This example was shot on at a shutter speed of 1/640th of a second and an aperture of f8.



Fixing the camera on a tripod eliminates camera shake. You now need to get the slowest shutter speed you can. The image at the top of the page was taken from a similar position as the previous shot, but with the addition of a 10stop ND filter to give a shutter speed of 30 secs and an aperture of f9.

CAPTURING MOVEMENT

Freezing the action with a fast shutter speed produces a nice sharp image, but sometimes you might want to allow a controlled amount of movement blur to show that the subject was in motion. There are a number of ways to accomplish this.

In this first movement example, the camera was held motionless, with a shutter speed of 1/1000th of a second, while the car drove past in front of the lens. No camera movement ensures that the background is sharp and the fast shutter speed has frozen the movement. The result is sharp but looks slightly odd, as though the vehicle is now simply at a standstill.

In this additional example, this time with the camera mounted on a tripod, the settings were adjusted to allow a shutter speed of 1/30th of a second, and another vehicular subject is allowed to drive past. This time the background remains sharp, but the slower shutter speed has resulted in lots of movement blur, making the car appear to streak across the frame and remove any sharp detail.

In order to capture the feeling of movement (top image), the best technique is to use a slow shutter speed, but to pan the camera (move it side-to-side) to follow the moving subject as you press the shutter. It is a technique that requires practice, since you need to be able to keep the camera moving smoothly as the exposure is taken, and avoid up-and-down movement as you press the shutter. It may take several tries to get it right, but when it works the results are very effective, with the subject stationary against a movement-blurred background. This shot was taken hand-held at a shutter speed of 1/10th of a second. Some recent cameras have a setting on the image stabilisation system to correct vertical movement but not horizontal, which helps with this kind of shot.

CAR LIGHTS AT NIGHT

Another interesting effect achieved using long shutter speeds is streaking car lights at night. The camera was set up on a tripod, using manual focus and full manual exposure, with a cable shutter release. Starting with an aperture of about f/4, you will need to dial in your settings to get a balanced exposure. If your exposure duration is still too short, stop your aperture down to f/5.6 or smaller until you get a longer exposure duration that renders car lights as long streaks. Generally, a shutter speed of around 4 seconds is a good starting point.

When shooting near heavy traffic at night it's obviously important to stay safe. Wear something bright and reflective, and don't get too close to the road. Also, never use a flash when taking photos of traffic. You could dazzle a driver and cause an accident.

FIREWORKS

One way to take good fireworks photos is to set your camera on a tripod some distance from the display, with the zoom set to a very wide-angle. Set a shutter speed of 2 seconds and as wide an aperture as you can manage. Getting the framing exactly right is simply a matter of luck, timing, and then cropping the photo later.

By using a very wide aperture and precise focusing, emphasis can be given to one subject to effectively isolate it from its surroundings.

Aperture and depth of field

With aperture you can control how much of your picture is in focus

WIDE APERTURE

NARROW APERTURE

Of the three main controls common to nearly all cameras, shutter speed, focus and aperture, it is aperture adjustment that is the least well understood. This is because it not only helps to control exposure, but also affects something called Depth of Field. Understanding the effects of aperture size is a vital skill for any keen photographer.

At least there's nothing mysterious about the name. The aperture is literally a hole through which light passes after it enters the lens. The diameter of this hole can be altered, allowing a greater or smaller amount of light to pass through on its way to the sensor. In the early days of photography, aperture was adjusted by slotting cards with different sized holes cut in them into the body of the camera behind the lens. These cards were known as 'stops', and this is still part of photographic terminology today. On modern cameras the aperture is controlled by an arrangement of curved shutters inside the body of the lens, which move to produce a continuously variable aperture, however the aperture settings are usually still referred to as 'F-stops'.

Aperture adjustment is used in combination with the shutter speed and ISO sensitivity to control photographic exposure. However it is also the primary means of controlling something called depth of field, a concept that may need a bit of explanation.

If you take a photo of a subject at a distance of about 3 metres with standard zoom lens, in good light with the focal length set to about 30mm, as long

> "Understanding the effects of aperture size is a vital skill for any keen photographer."

as the lens is focused correctly the subject should appear nice and sharp in the image. However you'll usually find that objects about 1.5m in front of the subject, and for about 4 or 5 metres behind the subject, also appear sharp. This distance, from the closest point of acceptable sharpness to the most distant, is known as the depth of field.

By altering the size of the aperture it is possible to control the extent of this depth of field, either reducing it so that only the main subject is in sharp focus, or expanding it so that an entire landscape can appear to be just as sharp.

If you have an older camera to hand, take a look at the lens. It will have a ring for controlling the aperture setting, labelled with numbers usually from about F2 to about F22. The focus control ring will have distances usually calibrated in feet and metres, and alongside it you'll usually find lines marked with the same numbers as the aperture ring, arranged in pairs either side of the focal distance mark with the larger numbers toward the outside. The purpose of this aperture scale is to help estimate the depth of field at a particular distance for any given aperture setting; with the focus set to a particular distance, anything between the two lines for the selected aperture setting should be acceptably sharp. Some older zoom lenses have a series of curved lines etched into the lens barrel for the same purpose. For some reason this scale is missing from most modern auto-focus, auto-aperture lenses, which is a shame because it makes the whole concept of depth of field much easier to understand.

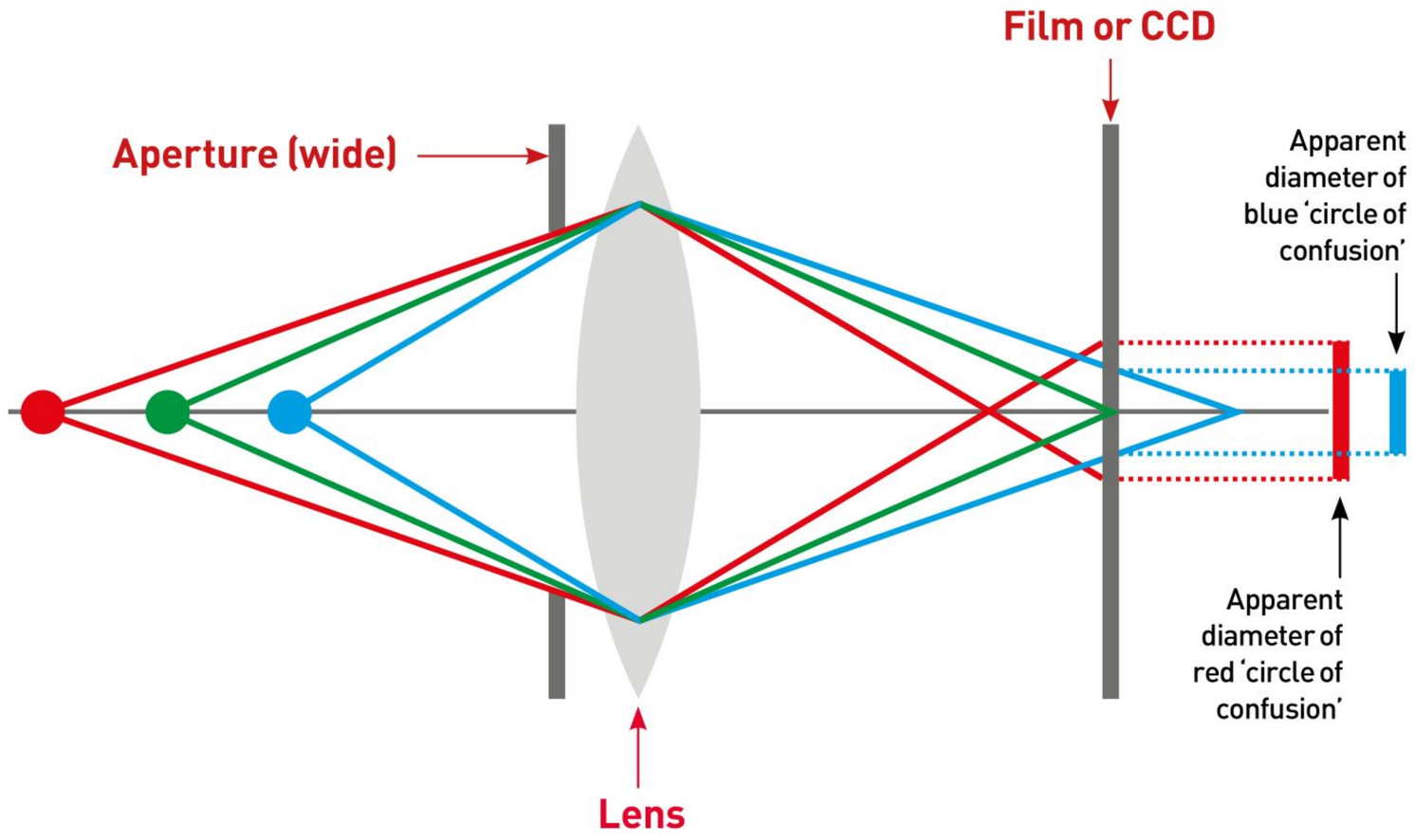
APERTURE RING

How aperture works

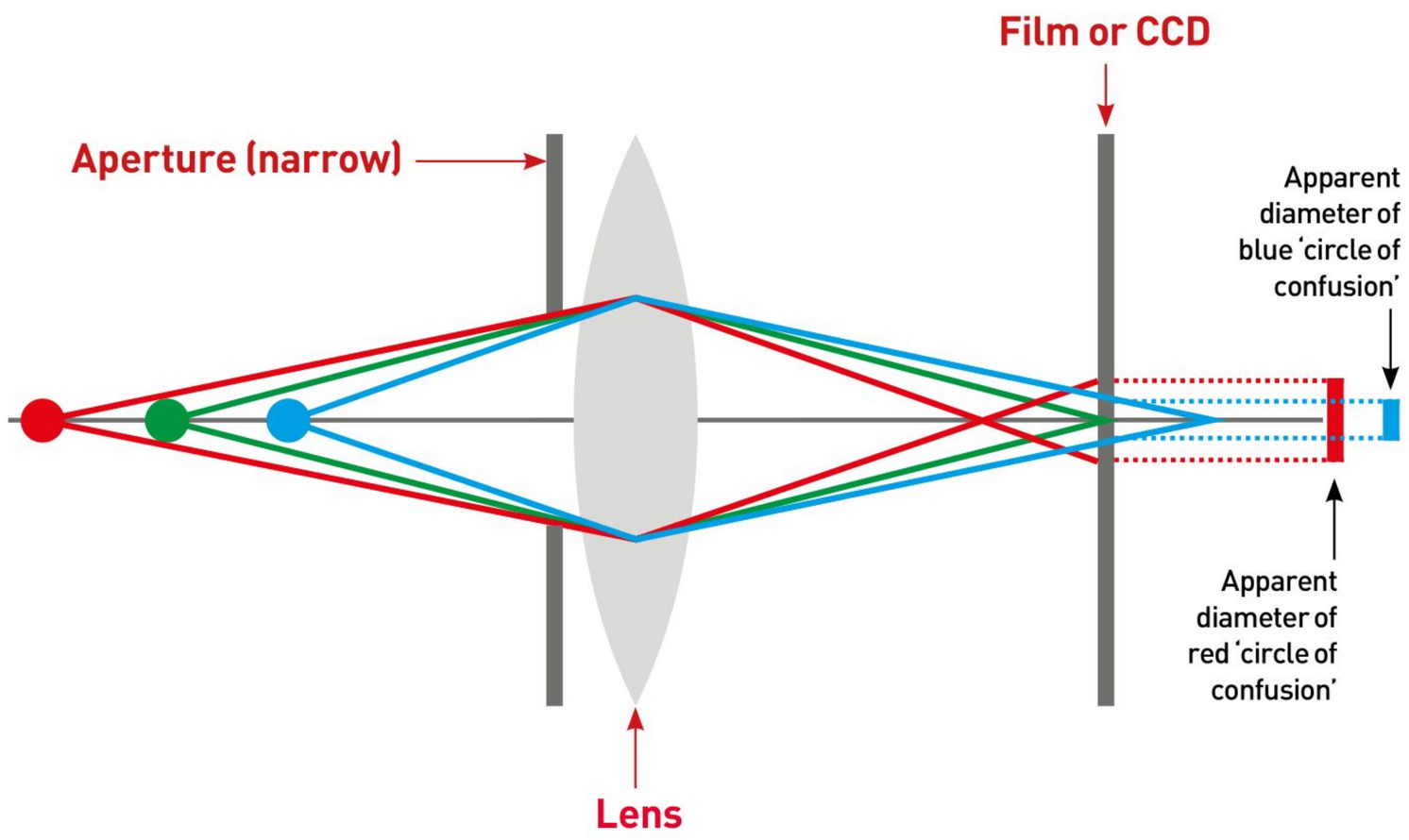
Explaining exactly why altering the size of the lens aperture alters the depth of field is a little complicated, but a few simple diagrams should help to shed some light on the matter. For a start, let's clear up some popular misconceptions about the difference between focus and sharpness.

This is a highly simplified diagram of the arrangement of lens, aperture and sensor inside a modern digital camera. In this first diagram, three subjects at different distances from the camera lens are represented by the red, green and blue dots. The lens is focused on the green spot, so light from it passes through the aperture and the lens and appears sharply focused on the sensor. Light from the red and blue spots also passes through the aperture and lens, but light from the red spot focuses a short distance in front of the charged coupled device (CCD), while light from the blue spot focuses a short distance behind it. The light from these other spots still hits the CCD, but due to light scattering it is unfocused and spread over a wide area.

What this means is that the red and blue spots will appear as large blurred spots on the final image, while the green spot will be sharp and in focus. The size of the blurred area of the red and blue spots is called the 'circle of confusion.'



The diagram below shows the same arrangement of camera and subjects, and the coloured spots are the same distance from the lens, but this time the aperture has been reduced to just a small hole. Again the lens is focused on the green spot, and the red and blue spots are out of focus. However the narrow aperture restricts the light scattering and the relative angles of the light paths, and as a result the 'circles of confusion' are much smaller. This makes the red and blue spots in the final image appear much sharper. They are still out of focus, but the effect is not so noticeable. To make circles of confusion as large as in the first image, the red and blue spots would have to be much further away from the green one.



FOCAL LENGTH AND DEPTH OF FIELD

The focal length of your lens, in other words how much you zoom in on your subject, also has a large effect on depth of field. Short focal lengths have much greater depth of field than longer focal lengths. This is one reason why, when taking a portrait shot, it's a good idea to step back a bit and zoom in rather than using a wide angle lens up close.

In optics, particularly as it relates to film and photography, depth of field (DOF) is the distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image. Although a lens can precisely focus at only one distance at a time, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is imperceptible under normal viewing conditions.

In some cases, it may be desirable to have the entire image sharp, and a large DOF is appropriate. In other cases, a small DOF may be more effective, emphasizing the subject whilst de-emphasising the foreground and background. In cinematography, a large DOF is often called deep focus, and a small DOF is often called shallow focus.

In the examples shown here, at f1.4, the second crossed wooden post nearest the camera was our point of focus. It is the only object in sharpest focus and the first post nearest camera and the third are blurred.

At f4 the area of acceptable focus has increased so that the first and third fence posts are starting to come into focus.

Shooting at f8 brings the first, third and fourth posts into sharper focus.

Stopping the camera down to its narrowest aperture of f22 has all four posts looking reasonably sharp, as is the bench at the back of the shot. If you were able to stop this lens down to f/32, even the foliage seen through the gaps in the fence would be sharper too.

"In optics, particularly as it relates to film and photography, depth of field (DOF) is the distance between the nearest and farthest objects in a scene that appear acceptably sharp in an image."

ACCEPTABLY SHARP

ACCEPTABLY SHARP

ACCEPTABLY SHARP

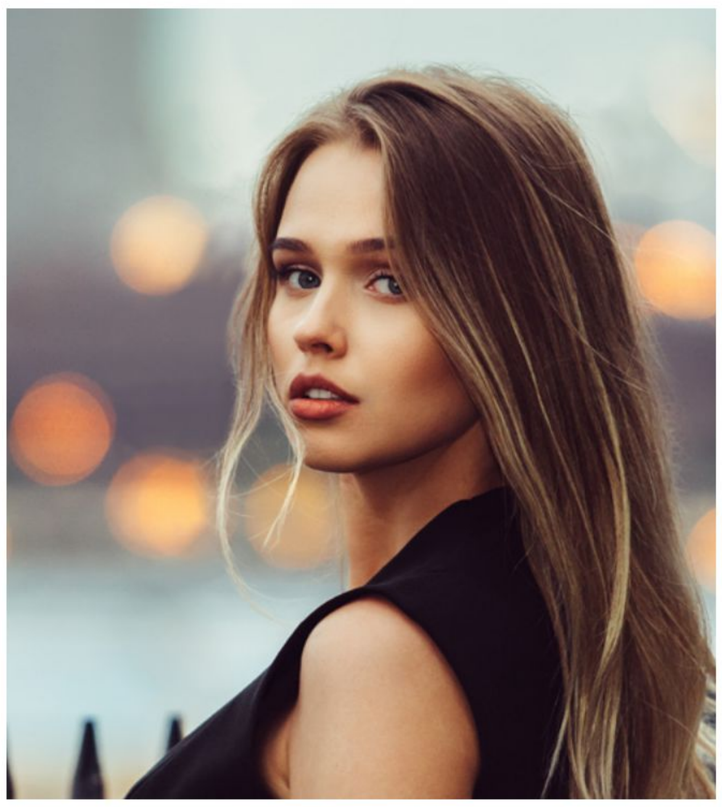
ACCEPTABLY SHARP

Practical uses for depth of field

There are several situations where controlling depth of field is important. The most common is portrait photography. Subjects shot on an automatic camera using a medium aperture usually have a lot of sharp foreground and background detail, which can distract attention away from the main subject.

As you can see in this example, which has a large depth of field, the subject is in focus, but so is the background, which draws the viewer's attention away from the subject.

By using a wider aperture, and moving the subject further from the background, only the subject is now in sharp focus. A blurred background is much less distracting, and concentrates your attention on the subject, making the subject really stand out from the background.



LANDSCAPE PHOTOGRAPHY

Another situation in which depth of field is an important issue is landscape photography. Here it is often important to maximise depth of field, so it is usual to use the smallest possible aperture. This shot was taken using an aperture of f/16, to ensure that both the foreground and distant background are in focus. It also uses something called Hyperfocal Distance, which involves a bit of maths to calculate.

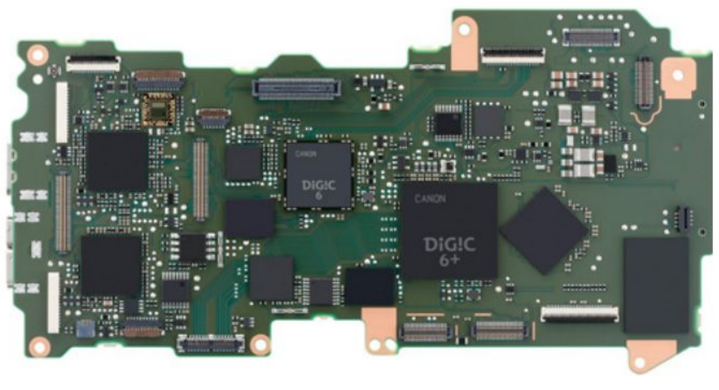
ISO and image noise

High ISO gives you faster shutter speeds in low light, but there's a price to pay

Anyone who has owned a digital camera for a while will be familiar with the concept of image noise. It's that grainy distortion that spoils pictures shot in low light conditions with high ISO settings. What is image noise, where does it come from and what can be done to prevent it?

All electronic devices generate noise. The background hiss of a radio, the sound of an over-amplified electric guitar, or the interference on a badly tuned television, all of these things are electronic noise, and so is the noise seen in a digital photograph.

This noise comes from a variety of sources. Some of it is generated by imperfections in the electronic components, or as a by-product of their normal operation. For instance, capacitors generate a small amount of noise as they charge and discharge. Electronic components can also be affected by environmental noise, such as the electrical fields that constantly surround us.



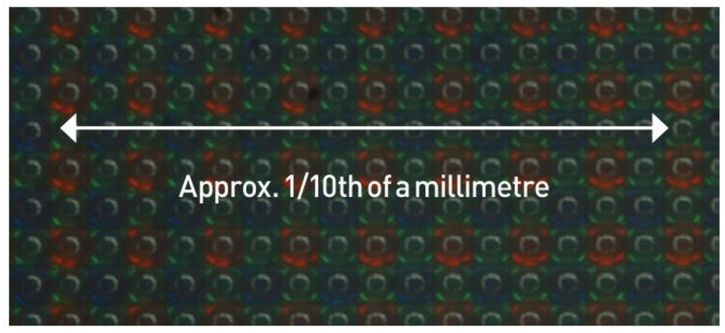
This is the main circuit board from a Canon EOS 5D MkIV digital SLR, showing the powerful DIGIC6 and DIGIC 6+ image processing chips.

Circuit noise can be minimised by superior manufacturing and rigorous quality control. Unfortunately some cheaper camera brands, or even budget models from better-known brands, may use components of lower quality, which is why these types of camera generally produce noisier images than the more expensive models.

Sensor noise

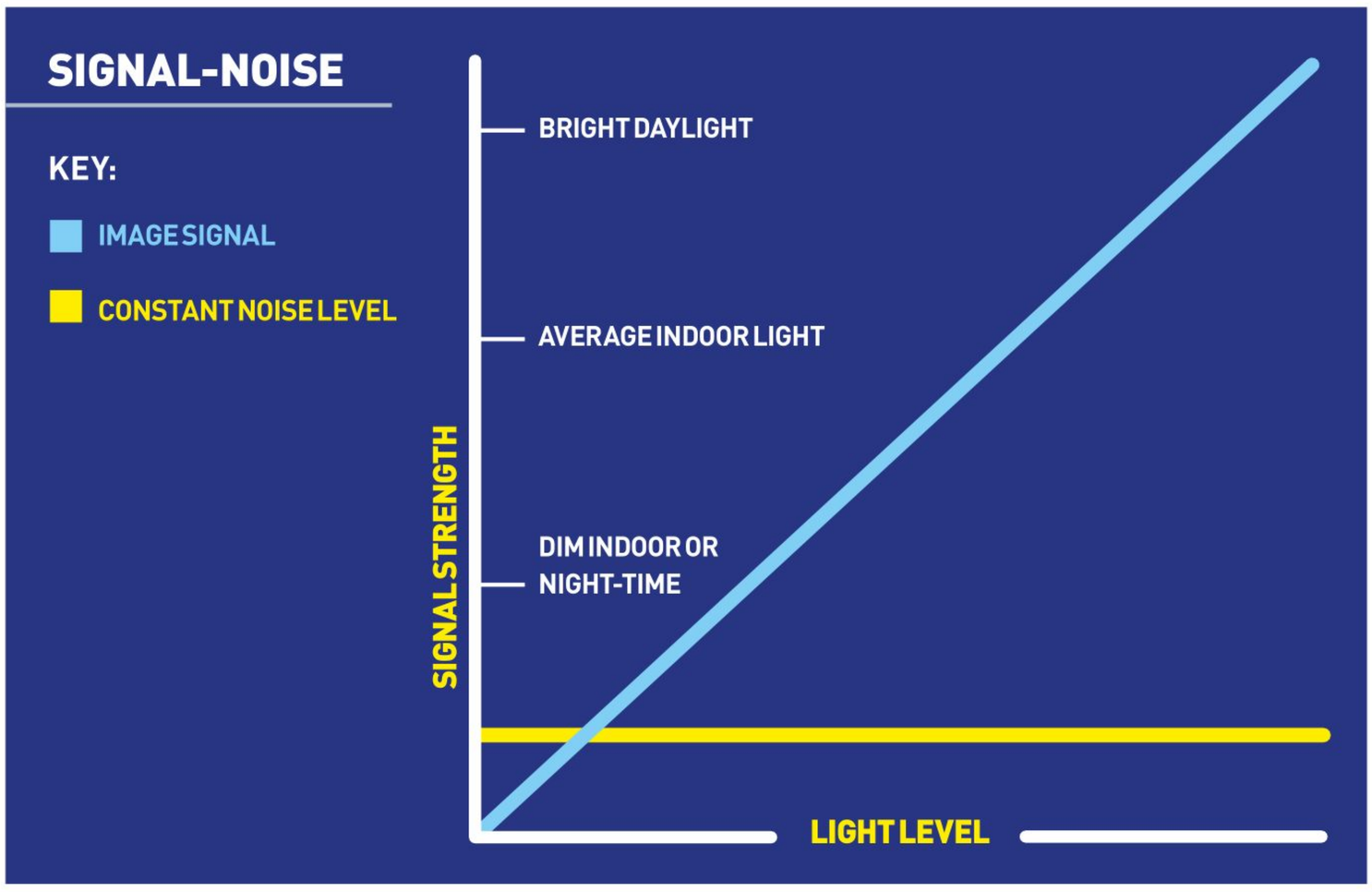
The other main source of image noise is the sensor itself, and in most cases this is unavoidable. The individual photocells on a digital camera sensor are incredibly small, especially with high-resolution compact camera sensors.

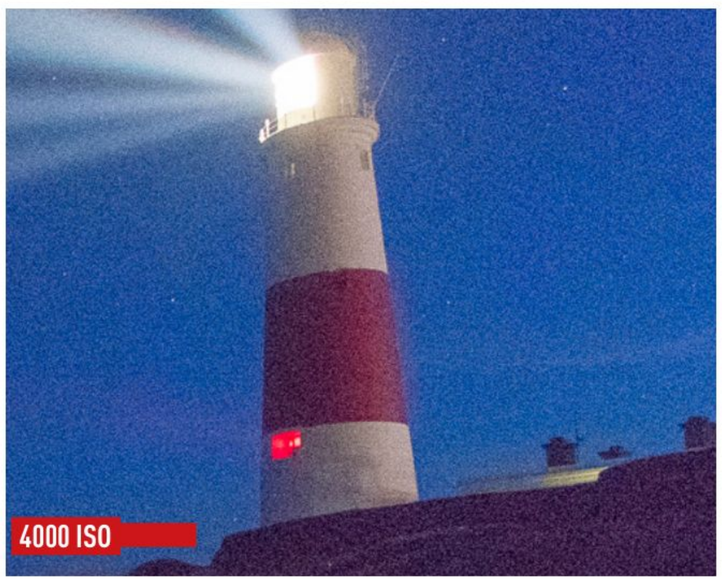
Most compact camera sensors have over 10 million individual photocells crammed into an area of less than 30 square millimetres. These photocells are so small that in low light conditions they may only be collecting a few thousand photons (individual light 'particles') during an exposure, so the level of the electrical signal produced by the cell can be affected by random statistical fluctuations in photon density. This is the main reason that physically larger sensors are much better than smaller ones. The individual photocells are larger and collect proportionately more light during the exposure producing an inherently higher signal to noise ratio.



Actual microscope photograph of the surface of a Nikon CCD, showing the Bayer mask filter and microlenses

The level of noise produced by the sensor and other components in the camera is usually constant and at a fairly low level. When taking photographs in good light the level of the signal vastly outweighs the level of noise; in other words the signal to noise ratio is very high, and consequently noise isn't a problem.



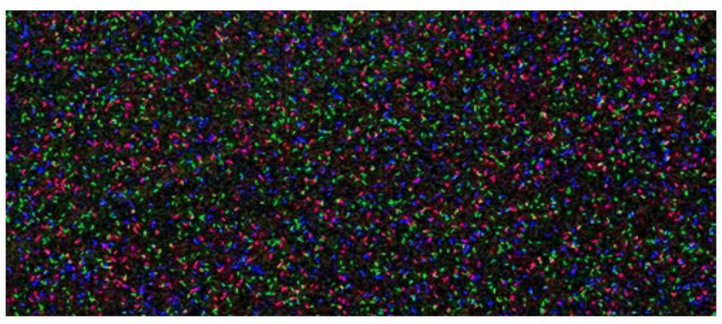


> **"When we set a higher ISO we are increasing the amount by which the signals from the sensor are amplified and unfortunately the noise gets amplified as well."**

The problems start when shooting in low light, as the level of the signal drops nearer to the constant noise level, producing a lower signal to noise ratio. At extremely low light levels the signal may be entirely drowned out by the noise.

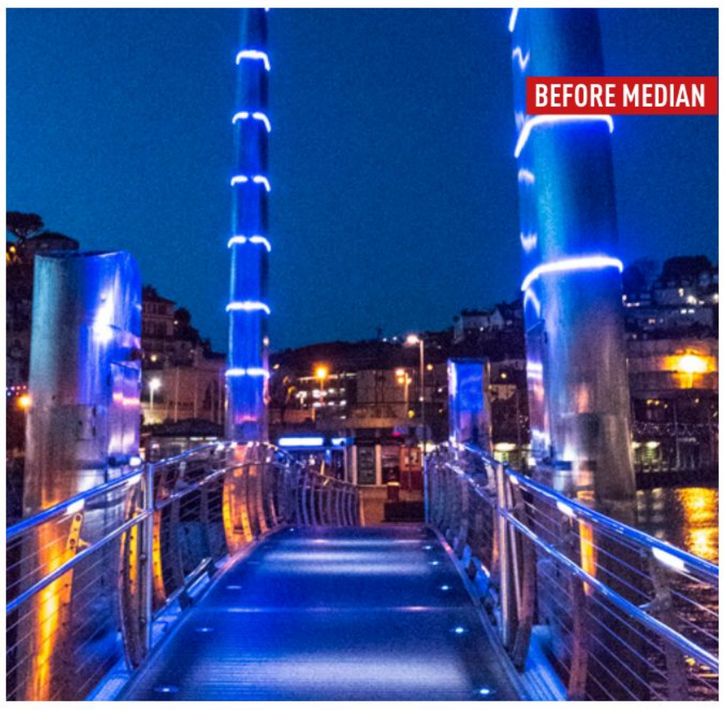
This problem is made worse when shooting at higher ISO settings. When we set a higher ISO we are increasing the amount by which the signals from the sensor are amplified, and unfortunately the noise gets amplified as well. If the signal to noise ratio was already very low then this just produces more noise without improving the image. This is why high ISO images are always more noisy than ones taken at lower settings.

Another type of sensor noise can also be a problem when using exposures longer than a couple of seconds. Sometimes the photocells that make up the sensor may not all respond to light to an equal degree, causing single pixels to appear very bright or very dark. The charge build-up over a longer exposure makes this problem more noticeable. Since the pattern of these "dead" or "hot" pixels is usually consistent from one frame to the next this type of noise is remedied by applying a filter during image processing. Most modern cameras do this automatically but it can be a problem on older models. Images taken on older cameras can show a lot of "hot" pixels, especially during long exposure photographs with no long exposure noise reduction. Below is an example of how bad it can get.



Noise reduction

Cameras reduce image noise by using smoothing filters during image processing. The most commonly used is called a Median filter. This works by comparing each pixel to the ones surrounding it, and if it has a brightness that is different from its neighbours then it is replaced by a new pixel with the average value of the nearby pixels. This eliminates noise effects, but also reduces detail and contrast. Compare these next two images. The first is unfiltered, the second has had a median filter applied. The second image is "cleaner", but as you can see the level of detail has been greatly reduced.



Another type of noise reduction is called "pixel binning", although this is less widely used in recent digital cameras. In this process, the signals from groups of four, nine or even 16 adjacent photocells are grouped together into a "super pixel". This has the effect of increasing the signal to noise ratio, but of course it also reduces the effective resolution of the image. It increases the signal to noise ratio, but it also reduces the quality of the image.

The only effective remedy to image noise is to use larger, more sensitive photocells. Digital SLRs have a major advantage in this area, since they have physically larger sensors. Compact camera sensor technology continues to improve, both in image processing and sensor design. We will undoubtedly see further advances in the future, but for now image noise is something we just have to accept. ■

Focusing

Getting the best out of your autofocus system

Some digital SLRs can use older manual focus lenses. Obviously they won't auto-focus, but the camera's AF system will tell you when the picture is in focus.

With only one or two exceptions, all current digital cameras have automatic focusing. The first autofocus systems were developed by Leica in the 1970s. The first autofocus compact camera, the Konica C35 AF, was introduced in 1977, and the first autofocus 35mm SLR, the Pentax ME-F, was launched in 1981. Since that time autofocus technology has improved immensely, and these days even the most basic modern AF systems are generally fast, accurate and reliable.

Although we now rely on autofocus for the vast majority of photographs, anyone who has tried taking a photo in low light, with fast-moving subjects or using very long telephoto lenses will have noticed that sometimes even the best AF system can run into problems. We've all stood there with the lens whirring in and out of focus, trying to get a lock on our subject, and eventually missed the shot. It's very frustrating when this happens, but with a few simple tips you can help your camera to focus quickly and accurately even

Different lenses have different minimum focusing distances, but many modern zoom telephoto lenses also have macro-focusing capabilities for close-ups.

"Autofocus technology has improved immensely, and these days even the most basic modern AF systems are generally fast, accurate and reliable."

By carefully focusing on just one part of the scene, and using limited depth of field, you can draw attention to it.

in difficult situations.

There are two main types of autofocus system in common use today. All compact cameras and most CSCs use something called contrast-detection AF, which samples the image from the main picture taking sensor and detects sharp high contrast edges in the details of the scene. Meanwhile all digital SLRs and Sony's new SLT cameras use something called phase-detection AF, which uses an array of separate dedicated sensors usually mounted below and in front of the main imaging sensor. Phase detection is a more complex system, but it is usually much faster, more accurate and works better in low light. However both systems require some detail in the scene to 'lock on' to. Try it for yourself: point your camera at a plain wall or a sheet of white paper and see if it will focus on it. Even if you own a top-of-the-range DSLR it won't be able to focus on a featureless surface.

There are a couple of ways to help your camera to focus quickly on a scene. Most digital cameras have the option to select either single or continuous autofocus. Your camera will normally start to focus on the scene as soon as you half-press the shutter button. In continuous focus mode it will continue to update the focus if you then move the camera, but in single AF mode it will hold the same focus setting as long as you hold down the button, until you actually take the shot. You can use this to focus the camera on low detail targets by finding an object in the scene that's the same distance away as your chosen subject, focusing on that, and then holding the focus and reframing the shot. Similarly you can use it in reverse to focus on objects that aren't in the centre of the frame.

Moving targets

Compact camera AF systems are usually somewhat slower than those in DSLRs, which means they can have a real problem focusing on moving subjects. The way around this is either to use continuous AF or, if your camera has this option, to use manual focus. If you can tell where your subject is going to be, such as a car going round a tight corner on a race track or a child on a swing, you can pre-focus the camera on this point and wait to take the picture at the right moment. This method takes some practice and good reflexes, but it can produce excellent results.

Close-ups

All cameras and lenses have a minimum focusing distance, a closest point beyond which they cannot focus. For many compact cameras this distance can be very small, in some cases as little as 2cm (1in), but for standard DSLR lenses the distances tend to be longer. Most compact cameras have a 'macro' setting, usually denoted by the symbol of a flower. To get closer focusing with a DSLR or CSC, special close-focus macro lenses have to be used.

Depth of field is greatly reduced at very close focusing distances, and you may find that your AF system doesn't focus on the right part of the subject, for example if you are trying to photograph the centre of a flower, but the AF focuses on the petals, because they're closer. The best option is to use a tripod, and manually set the focus to the closest distance. Move the tripod until the front of the subject comes into focus, then carefully manually adjust the focus point to get the right part of the flower to look sharp. ■

Focal length and zoom

Understanding how focal length works in composing shots

Nearly all modern compact cameras have zoom lenses, and most users of digital SLRs or CSCs will also have at least a couple of zooms in their kit. Focal length is one of your primary tools for adjusting composition. Selecting the right focal length for the scene allows the photographer to control perspective, angle of view and magnification, and can radically alter the mood and style of the photo. Some focal lengths are more suited to particular types of photo, and the properties of wide-angle and telephoto lenses can be used to produce particular effects. Understanding how focal length works and how it affects your photos is a vital photographic skill.

LENSES AND FOCAL LENGTH

> "Selecting the right focal length for the scene allows the photographer to control perspective, angle of view and magnification."

There are basically two types of lens: those with fixed focal lengths, also known as prime lenses; and those with variable focal length, or zoom lenses. They both have their own advantages and disadvantages. Prime lenses are usually smaller and lighter than zooms, and also generally have much faster maximum apertures than a zoom lens at equivalent focal length. The optical quality of prime lenses is also usually a little higher than the equivalent zoom lens. Zoom lenses however are much more convenient, allowing the photographer to cover a wide range of focal lengths with just one or two lenses, rather than carrying around a bulky collection of prime lenses. There are some fast zoom lenses, but they tend to be extremely expensive.

The focal length of a lens is an expression of its magnifying power, and is usually stated in millimetres. If you look on the front of your camera, usually inscribed around the front of the lens you'll find the focal length, or a range of values for zoom lenses. For a typical DSLR kit lens this will usually be around 18-55mm.

For digital cameras it is fairly usual to see two figures quoted, both the actual focal length and the 'equivalent' length. The reason for quoting both is simply that most people are more familiar with the sizes of 35mm lenses, so they know that 28mm is wide angle and suitable for panoramic shots, or that 200mm is a telephoto lens, suitable for long-range subjects.

Real and equivalent focal lengths are different because most digital camera sensors are a lot smaller than a frame of 35mm film, and are fitted much closer to the lens than the film would be. Most consumer DSLRs use the APS-C sensor format. Exact sizes vary from one manufacturer to the next, but are typically around 22.5 x 15 mm. A frame of 35mm film measures 36 x 24mm, which means that the edges are 1.6x longer, so the focal length of the lens would need to be 1.6x greater to produce the same image size and magnification. This is usually referred to as the 'conversion factor' or 'crop factor'. It means that a typical 18-55mm DSLR zoom lens is roughly equivalent to the popular 28-80mm zoom lens often used on 35mm systems.

Compact camera sensors are even smaller still. Because there are several different sizes of sensor in common use it is more usual for compact camera zoom lenses to be rated in terms of their magnification power, such as 3x, 4x, 10x etc. This relates to the difference between the minimum and maximum focal lengths. A lens with a range of focal length from 5.8mm to 17.4mm is called a 3x zoom, because 17.4 = 3 x 5.8.

While in older prime lenses a 200mm lens would literally be 20cm long, modern optical systems use multiple lens elements working in combination, which means that the light path can be shortened while still maintaining the same effective magnification. As a result quite powerful telephoto and zoom lenses can be relatively compact.

Wide-angle and telephoto are relative terms. On a 35mm film SLR a 50mm lens produces approximately the same perspective and magnification as the human eye, and has traditionally been the standard lens for this type of camera.

Anything longer than 50mm is considered a telephoto, while anything shorter is considered wide angle. Digital SLRs tend to follow this rule too, although considering the crop factor the mid-point is approximately 35mm.

300MM TELEPHOTO

50-200MM ZOOM

18-55MM KIT LENS

14MM WIDE-ANGLE

Exposure and metering

Accurate exposure is the key to good photography

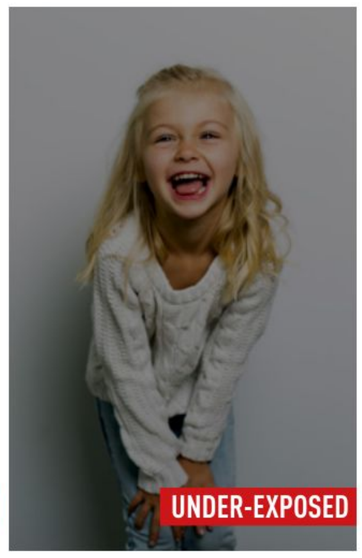
Understanding exposure and how it affects your photographs is probably the single most important technical skill you can learn in photography. It's certainly the one that most people get wrong, and apart from camera shake, bad exposure probably ruins more photos than any other single cause. The main problem is over reliance on automatic metering.

Most modern cameras, even relatively cheap compacts, have sophisticated built-in TTL multi-zone evaluative exposure meters that measure light levels at dozens, in some cases hundreds, of points within the frame, instantly comparing the results with a built-in library of exposure situations and automatically adjusting the shutter speed and aperture to deal with problems such as back-lighting, close-ups or moving subjects.

In most cases these automatic exposure systems are very good, and can reliably cope with most common circumstances. However even the best automatic meter can be fooled, resulting in poorly exposed photos. By overriding the camera's automatic settings and adjusting exposure manually we can avoid these problems and take much better photos.

Let's take a look at a couple of examples. In this first scene we have a portrait of brightly lit fair skinned model shot against a dark background. This was taken using a typical DSLR camera set on automatic exposure. As you can see the camera has badly over-exposed our model's face, losing details in the highlight areas.

In this second example the same camera has been used to photograph another model, but this time standing in front of a brightly lit background. In this case the camera's automatic exposure system has seriously under-exposed the shot, leaving the model's face in deep shadow with little detail visible.



The same usually reliable exposure meter took both of these shots, so what went wrong? In order to understand what happened and accurately correct it, it is necessary to know how light meters operate, and the rules by which exposure is calculated.

FIG.1 ORIGINAL SCENE

FIG.2 THE LIGHT METER WILL AVERAGE THE SCENE

FIG.3 THE AVERAGE RESULT WILL BE MID-TONE GREY

> "Apart from camera shake, bad exposure probably ruins more photos than any other single cause. The main problem is over reliance on automatic metering."

Fade to grey

Take a look at the main picture above. What you see there is a nice scene of a rural area in bright sunlit conditions, with a good tonal range, plenty of colour and some nice crisp sunlight. What your camera's light meter sees is very different as our example above shows. Try it out for yourself. Find any nice, average snapshot scene, properly lit and with good contrast like our example **[FIG.1]**. Start up your image editing software and open your picture. Light meters only see in black and white, so reduce the saturation of the shot to zero. Your light meter doesn't see detail, so set your Gaussian blur filter **[FIG.2]** to maximum diameter and apply it a couple of times. Use the eyedropper tool to measure the RGB colour value of the resulting tone. You should find that it averages out to a mid-tone grey **[FIG.3]** with an RGB value of around 127,127,127.

It's an interesting and curious fact that any average scene reflects 18% of the light falling on it. Look out of your window, and unless you live in Antarctica the scene you see is reflecting exactly the same amount of light as the scene out of my window. That 18% reflection is exactly the same as a mid-tone grey, midway between black and white.

Light meters are calibrated with this fact in mind. When your camera takes a light reading, the meter averages the scene and adjusts the exposure to produce that mid-tone grey (or 12% luminance, but that's another discussion altogether). If you point the camera at a black stage curtain, it will try to make the black into a mid-tone grey, so it will over-expose. If you point it at snow it will try to make the white into grey, so it will under-expose.

Adjusting exposure

Let's take a moment to explain how exposure is controlled, and what is meant by some of the terminology. If you already know the basics, feel free to skip to the next page.

On all cameras, exposure is adjusted by altering two settings; aperture and shutter speed. Between them they control the amount of light that hits the sensor when the shot is taken.

Shutter speed is self-explanatory, it is simply the amount of time that the sensor is exposed to light. This is usually controlled by an electrically operated mechanical shutter in front of the sensor that opens and closes very quickly for a precisely measured period of time, usually in the order of a few hundredths of a second. Obviously a shutter speed twice as long lets in twice as much light, one half as long lets in half as much.

The aperture is literally just a hole through which light passes on its way to the sensor. The diameter of that hole can be adjusted to precisely calibrated sizes. A smaller hole lets in less light, and a larger hole lets in more.

These calibrated aperture sizes, for largely historical reasons, are called stops, or f-stops. An aperture setting one stop larger lets in twice as much light. For reasons that are both historical and mathematical, the standard full-stop aperture settings that you are most likely to encounter go f/1, f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16 and f/22. The smaller numbers refer to larger apertures, and the larger numbers to smaller ones. Many cameras can set apertures in increments of 1/3rd of a stop, but the whole-stop numbers are the ones to remember.

Let's consider an example. With your camera set to automatic exposure point it at a scene and take a light reading. For the sake of argument, say the light meter sets an aperture of f/8 and 1/200th of a second. You can produce the same exposure by increasing the aperture by one stop to f/5.6 and halving the shutter speed to 1/400th of a second, because this lets the same amount of light through to the sensor. Similarly, reducing the aperture to f/11 and setting the shutter speed to 1/100th of a second will also produce the same exposure.

However by altering one setting without altering the other you will change the exposure. In our example, changing the aperture to f/5.6 but leaving the shutter speed at 1/200th of a second will increase the exposure by one stop, or one exposure value (EV), making the picture brighter. Decreasing the aperture to f/11 will reduce the exposure by one EV, making the picture darker.

Similarly, changing the shutter speed while leaving the aperture alone will also change the exposure. Double the shutter speed to 1/400th at f/8 and you reduce the exposure by one stop, halve the speed to 1/100th and you increase the exposure by one stop.

The Zone System

In 1939-40 the pioneering photographers Ansel Adams and Fred Archer developed an exposure system based on this fact, a system that is still used today. It is called the Zone System, and is quite possibly the most useful piece of photographic knowledge you'll ever learn. There are several variations on the original system, but I'll go with the one that is easiest to understand.

Starting with 18% grey as the mid-point, the system divides all the tones between black and white into 11 zones, numbered 0-10. Zone 0 is featureless black with no details visible, which in your image editor would have an RGB value of 0,0,0. Zone 10 is pure white with no details visible, and an RGB value of 255,255,255. The mid-tone 18% grey is zone 5, and should have an RGB value of about 127,127,127.

The zones represent exposure values, or EV. The difference between one zone and the next is equivalent to the difference between one exposure setting and another one exactly one stop higher or lower.

"The difference between one zone and the next is equivalent to the difference between one exposure setting and another one exactly one stop higher or lower."

PUTTING IT ALL TOGETHER

If we relate the tone scale of the Zone System scale to real world objects we can use it to help produce accurately exposed photos. The zones are roughly equivalent to the following scene elements (adapted from Adams' descriptions).

Zone 0	Pure black, no details or texture visible.
Zone 1	Black tone but no texture. This is normally as black as you want to get in a picture.
Zone 2	First hint of texture and detail, very deep shadow.
Zone 3	Dark materials, details visible.
Zone 4	Dark foliage. Dark stone. Landscape shadow. Shadow on portraits in sunlight.
Zone 5	Clear north sky. Dark skin. Grey stone. Weathered wood. 18% mid grey.
Zone 6	Average Caucasian skin value. Light stone. Shadows in sunlit snow.
Zone 7	Very light skin. Light grey objects. Snow with side lighting.
Zone 8	White with texture. Snow in shade. Highlights on Caucasian skin.
Zone 9	Glaring white surfaces. Snow in flat sunlight. White without texture.
Zone 10	Light sources, reflections of sunlight on metal. Pure white.

Let's go back to the two troublesome portraits from the first page. If we use the spot meter to take a reading from the subject's face, we know that the light meter will give a reading that would make the face mid-tone grey, which is zone 5. However from the zone chart we know that average Caucasian skin should be zone 6, so we need to increase the spot metered exposure by one stop, in this case from 1/30th at f/5.6 to 1/30th at f/4. In the resulting shot the background details are all burned out, but the subject is correctly exposed.

For the over-exposed portrait against the dark background, we can use a similar approach. Spot metering the background gives an exposure setting of 1/3rd sec at f/5.6 to render it as zone 5 mid-grey. By reducing that exposure by four stops to 1/3rd at f/22 we can make the background come out as what it should be, zone 2 deep shadow, leaving the model's face also correctly exposed.

The zone exposure system can help with difficult exposures, but it is helpful in another way. Learning to think of images in terms of tone and dynamic range will encourage you to approach these concepts in a creative way, and to use them to produce better pictures. Controlling exposure is the primary creative tool of the photographer, and learning how to use it will make the difference between mere snapshots and artistic photographs.

This system has been used by professional photographers for over 70 years. Used properly, it can help to improve your photography immensely, probably more than any other single technique.

> "The zone system can help with difficult exposures. Learning to think of images in terms of tone and dynamic range will encourage you to approach these concepts creatively."

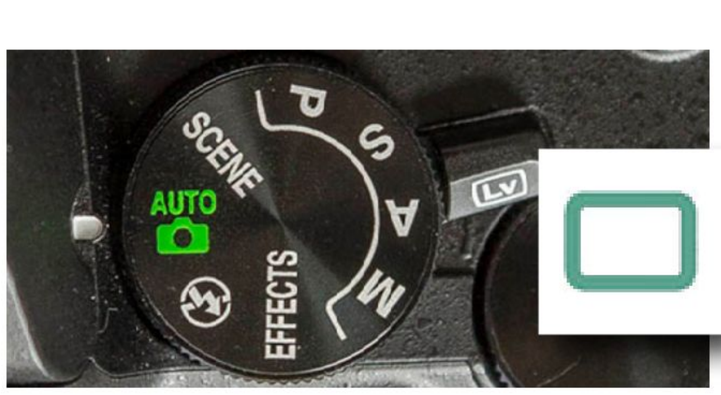
Shooting modes

Choosing the best setting for the correct shooting conditions

All but the most basic budget compact cameras have a selection of shooting modes, usually chosen by a dial on the top or back of the camera. Easy-to-use, mainly automatic cameras in the range will only have a few shooting modes, while the more sophisticated cameras such as the DSLR may have as many as a dozen, including manual exposure options and user-programmable special settings.

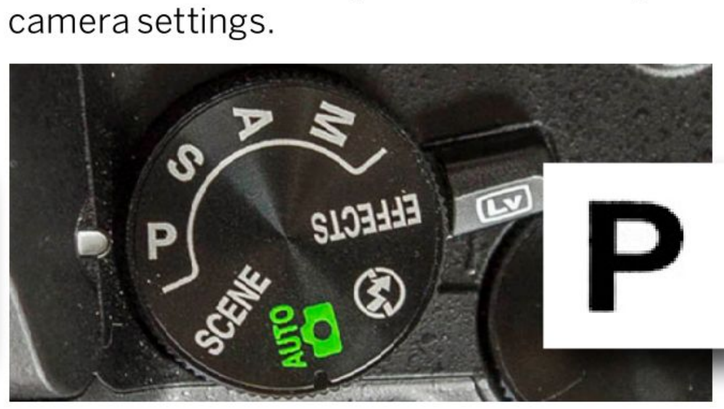
As newer models appear in the range or older models are updated, the shooting modes available will be revised and possibly expanded. Shown on this spread are some of the most often used modes selected from the mode dial on the top of the camera and in some cases, from the menu screen on the back of the camera. ■

Auto
The camera will analyse the scene and choose all the best settings.



Auto (flash off)
As in full auto mode but the flash will not be activated when shooting.

Programmed AE
Programmed auto is recommended for shots where there may not be time to adjust camera settings.



Shutter Priority
Shutter speed is manually selected to blur or freeze motion. Aperture is set by camera.

Aperture Priority
Aperture is manually selected to blur or bring background into focus. Camera chooses shutter speed.

Manual Exposure
The user can manually choose shutter speed and aperture.

Bulb Mode
Allows you to take photos for as long as the shutter button is held down for exposures longer than 30 seconds.

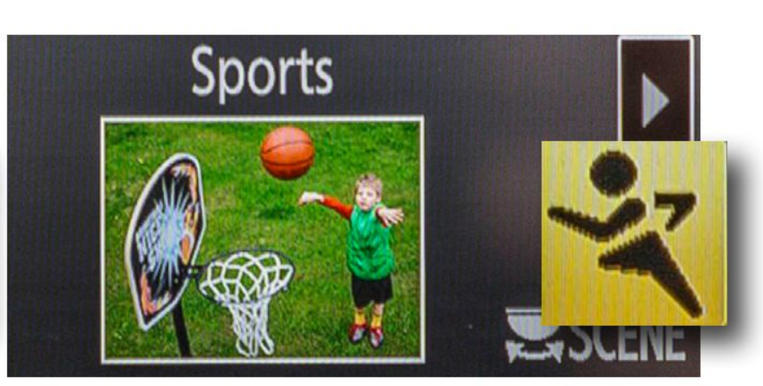
Effects
Can be used to add filter effects to your images when they have been shot.

Scene - Portrait
Background details will be blurred to add a sense of depth to the composition.

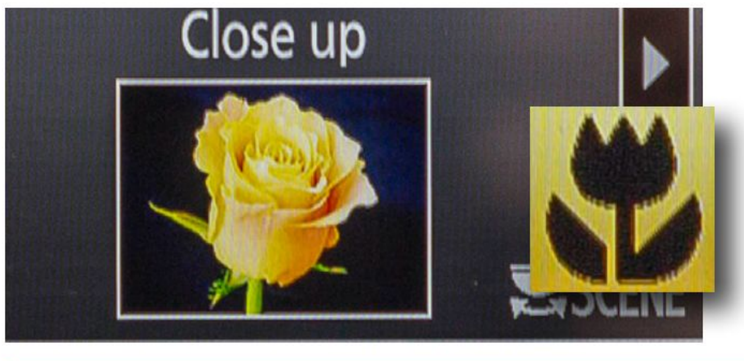
Scene - Landscape
Landscapes taken during the day will have front to back sharpness. Colours will be made more vivid.

Scene - Child
Skin kept soft and natural whilst clothes and backgrounds are more saturated. Shutter speeds will be faster to capture movement.

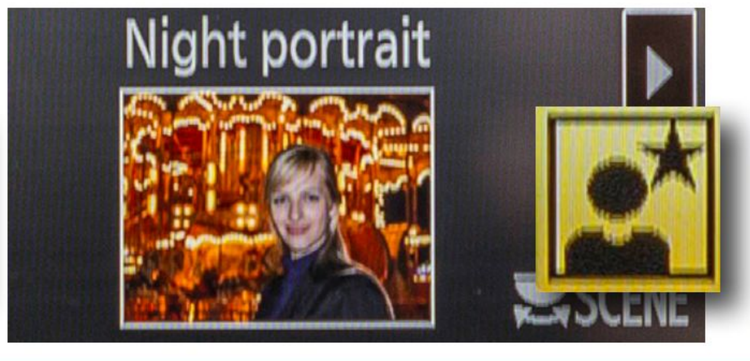
Scene - Sports
For dynamic sports. Shutter speeds will be high enough to freeze the action.



Scene - Close Up
For close up and macro shots of insects, flowers and other small objects. Backgrounds will be out of focus.



Scene - Night Portrait
Creates a natural balance between your foreground subject and low light backgrounds.



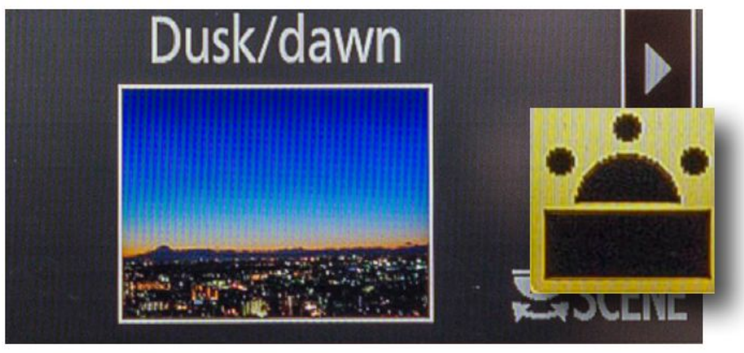
Scene - Night Landscape
Will reduce noise and strong colours such as street lights and neon.

Scene - Party/Indoor
For indoor scenes and other social gatherings. Captures indoor background lighting.

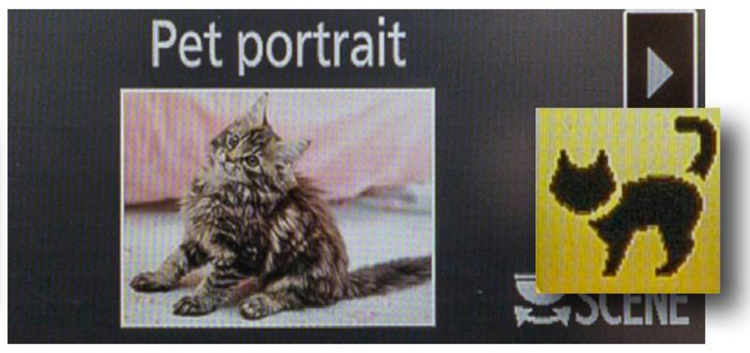
Scene - Beach/Snow
More accurately capture the brightness of areas like snow or sand in daylight.

Scene - Sunset
Maintains the rich colours and hues of the sunrise or sunset.

Scene - Dusk/Dawn
The cooler tones of dusk and dawn are maintained. No flash is used.



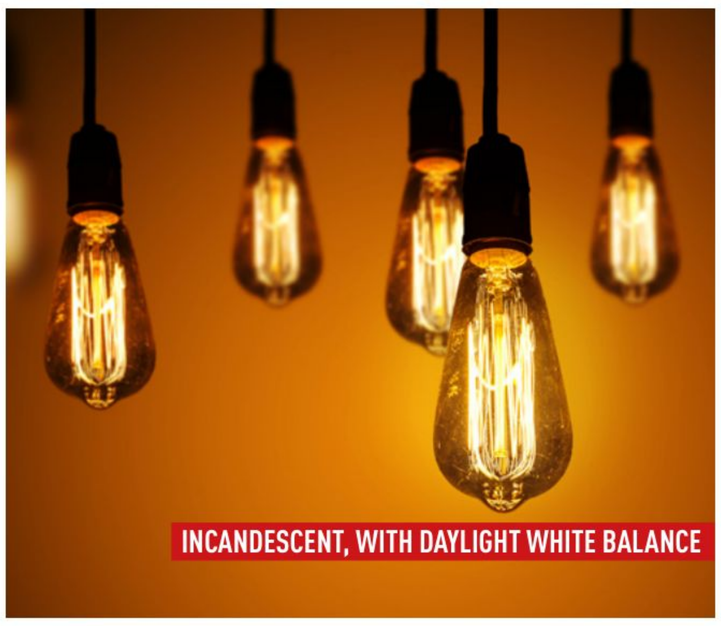
Scene - Pet Portrait
Faster shutter speed is employed. No AF assist light is used so as not to scare the animal.



Scene - Candlelight
The deep orange and red tones of scenes lit by candlelight are enhanced. No flash is used.

White balance

White may not be as white as you think


INCANDESCENT, WITH DAYLIGHT WHITE BALANCE

INCANDESCENT LIGHT, INCANDESCENT WHITE BALANCE

When you look at, for example, a sheet of white paper, your brain adjusts what you see so that it matches what you are expecting to see. However your digital camera doesn't have any expectations, and the colour that it "sees" is the actual colour present in the scene.

'White' light visible to humans can actually vary in colour from reddish orange to greenish-blue. This variation is usually described as a temperature range, with warm being the red end and cold at the blue end, and is usually measured in degrees Kelvin using a colour meter. Confusingly, the higher the colour temperature, the cooler the tone and vice versa.

We perceive various shades of white light illuminating a scene as neutral, a clever trick performed by our brains to maintain a sense of normality. Digital cameras can perform the same trick using a feature called automatic white balance. The camera evaluates the scene through the lens, analysing areas it guesses should be white (highlights) and black (shadows). More expensive cameras have a more reliable ambient white balance sensor that measures the temperature of general, focused light. However these automatic systems can be fooled, so most cameras give you the option of setting the white balance manually, either from pre-sets that cover most normal lighting conditions or by making an accurate measurement of the prevailing lighting conditions.

In the example pictures on this page you'll see an image with ordinary incandescent light bulbs, also called tungsten lighting. As you can see, when the camera is set to the warm artificial light white balance setting that suits this lighting, the light areas of the scene are neutral. The same scene looks very different when the camera's white balance is set to normal daylight colour temperature. Now there is a distinct reddish-orange cast. Light bulbs can shine with various colour temperatures. Cheap traditional, low wattage light bulbs tend to be the warmest in colour, while low voltage halogen bulbs are cooler in tone.

Another example is a typical noon day outdoor scene where the ambient white light temperature is cool. When the camera's white balance setting matches the cool tone of the brightness of the sun, everything looks quite normal. On the other hand, if the camera has been set for tungsten artificial light, the scene appears to have a very

DAYLIGHT, WITH DAYLIGHT WHITE BALANCE

DAYLIGHT, INCANDESCENT WHITE BALANCE

blue cast. Sunlight, like artificial light, can vary quite considerably in colour temperature. Early morning and late afternoon daylight is warmer as cooler components of the light are filtered out because it has to shine through more atmosphere and its pollutants as the sun is nearer the horizon. Meanwhile, cloudy and overcast conditions deliver a cooler light because warmer components are filtered out by the cloud.

Our third example is lit with fluorescent lighting, and presents an even harder challenge for your digital camera. The visible spectrum of fluorescent light is not a nice smooth line, it's full of peaks and troughs. Some fluorescent lights have a green cast and others a pink cast. These differences are visibly evident where strip lights of different tone have been fitted side by side. So-called daylight tone fluorescent lights are not equivalent to real daylight. Better digital cameras will have a number of presets for fluorescent light to help you match the white balance in these conditions more accurately. In our example here, the fluorescent light is a greenish yellow in tone.

Know your camera

Nearly all digital cameras offer white balance adjustments accessible either from a settings menu or, typically on higher spec cameras, via an external button in conjunction with an LCD display.

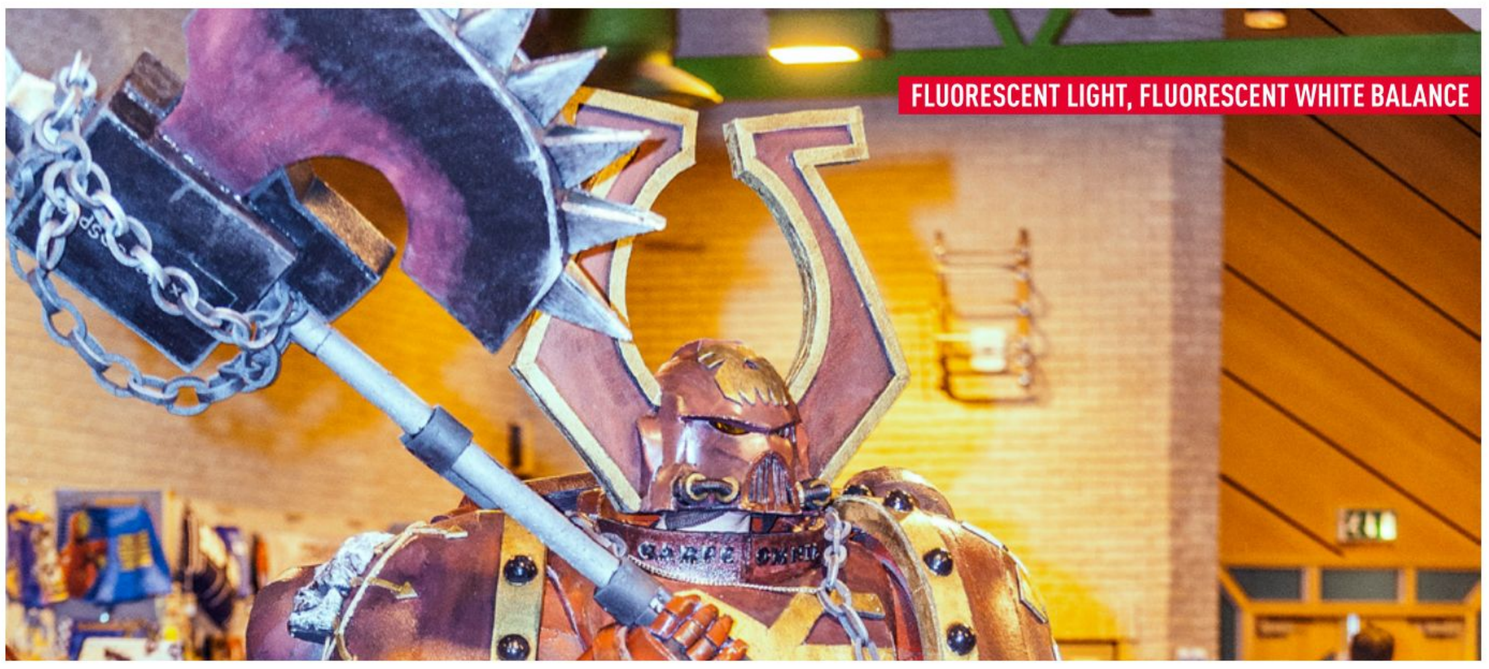
Manual white balance

Some cameras can let you calibrate the white balance setting manually. You simply hold a white card in front of the camera lens and press a white balance calibration button. The camera adjusts its white balance setting until the card is reproduced neutrally. Beware of this setting remaining on as when you return to normal shooting conditions it may spoil your pictures!

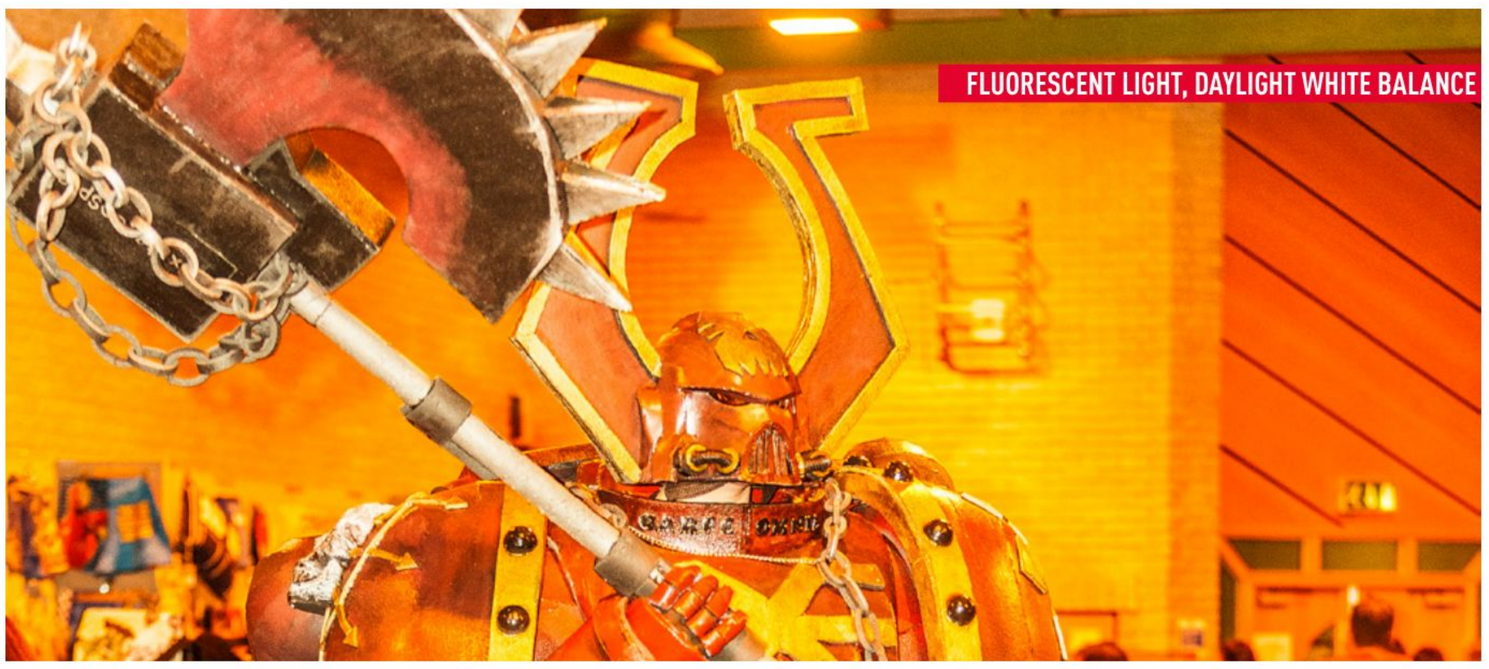
Preset white balance

All digital cameras offer a choice of white balance presets, and some cameras let you choose the setting via colour temperature values. Some really advanced cameras let you bracket white balance settings, or take a series of shots with settings above and below your standard setting. ■

"We perceive various shades of white light illuminating a scene as neutral, a trick performed by our brains to maintain a sense of normality."



FLUORESCENT LIGHT, FLUORESCENT WHITE BALANCE



FLUORESCENT LIGHT, DAYLIGHT WHITE BALANCE

TYPICAL WHITE BALANCE VALUES

TUNGSTEN/ARTIFICIAL

2500-3000K

Indoor lighting using traditional non-fluorescent light bulbs.

FLUORESCENT

3500-5500K

Include strip lighting and modern compact fluorescent lamps

NORMAL DAYLIGHT

5500-6000K

Typical mid-morning to mid-afternoon conditions at sea level.

CLOUDY/OVERCAST

6000-8000K

Hazy or overcast conditions.

CLEAR BLUE SKY

10,000-15,000K

Exceptionally clear mid-summer or high altitude conditions, especially snow scenes.

TAKE BETTER PHOTOGRAPHS

Some tips that can help you improve as a photographer

Have you been taking photos for a while and wondered why they still look like simple snaps and not professional level images? For anyone new to photography and even those who have been shooting for a while, there are any number of reasons why the shots don't have that certain 'something' yet. If you've gotten to grips with the basics and know how to get a well exposed photograph that is free of camera shake and is acceptably sharp, then the next step is to get a few simple tricks under your belt that can help you produce well-balanced photographs that stand out from the crowd.

Professional photographers use some very simple tricks and rules-of-thumb that have been developed over many years and even include rules of composition that are inspired by classical art. That may sound a little off-putting but don't worry, we've got a few tips that once you've tried them out, will help you develop as a photographer. There are more hints and tips than we have room to cover, but we've got a few that should prove useful. Even if you focus on just a few favourites, they can form the foundation of your very own photographic style that can stand you in good stead for years to come. ■

54 Choose the right camera
54 Choose the right lens
54 Buy a tripod
54 Early bird
55 Visual interest
55 Pick a prime
55 The holy trinity
55 Stop the shakes
56 Depth cueing
56 Enhance your photos
56 Are you compensating?
56 Don't fear the histogram
57 Learn from others
57 Further afield
57 Out of the shadows
57 Batteries
58 A sense of perspective
58 Maximum exposure
58 Lock it up
58 Filter systems
59 There's an app for that
59 Take control
59 Stay sharp
59 Persistence pays off

"Have you been taking photos for a while and wondered why they still look like simple snaps and not professional level images?"

1

Choose the right camera

When you're looking to buy a new camera for your photography, make a list of your requirements and set yourself a budget. Don't forget to allow for accessories such as lenses, a tripod and cleaning kit if you need them. Don't fall in to the trap of thinking that a more expensive camera will make you a better photographer. You're much more likely to improve your technique by overcoming the limitations of cheaper kit than by spending more money than you need to.

2

Choose the right lens

If you're buying a compact system camera or DSLR, it will probably come with a standard telephoto lens that is ideal for general photography and snapshots but there is a wide variety of special lenses available for other types of photography. If you like to shoot landscapes, get a good wide-zoom lens but avoid super-wide lenses as these will distort the image. If you want to shoot wildlife, you'll need a high quality fast telephoto but this will be expensive.

3

Buy a tripod

Improve your photography by investing in a decent tripod. For the best combination of strength, rigidity and portability, the ideal choice is carbon fibre. They start at around £120 ($175, €165) and can cost ten times more, so if that's too expensive get a good quality aluminium one. Features to look for include a ratcheted centre column, portrait-format tilt and all-metal construction. Avoid ones with plastic heads, as they are seldom rigid enough to prevent camera shake on long exposures.

4

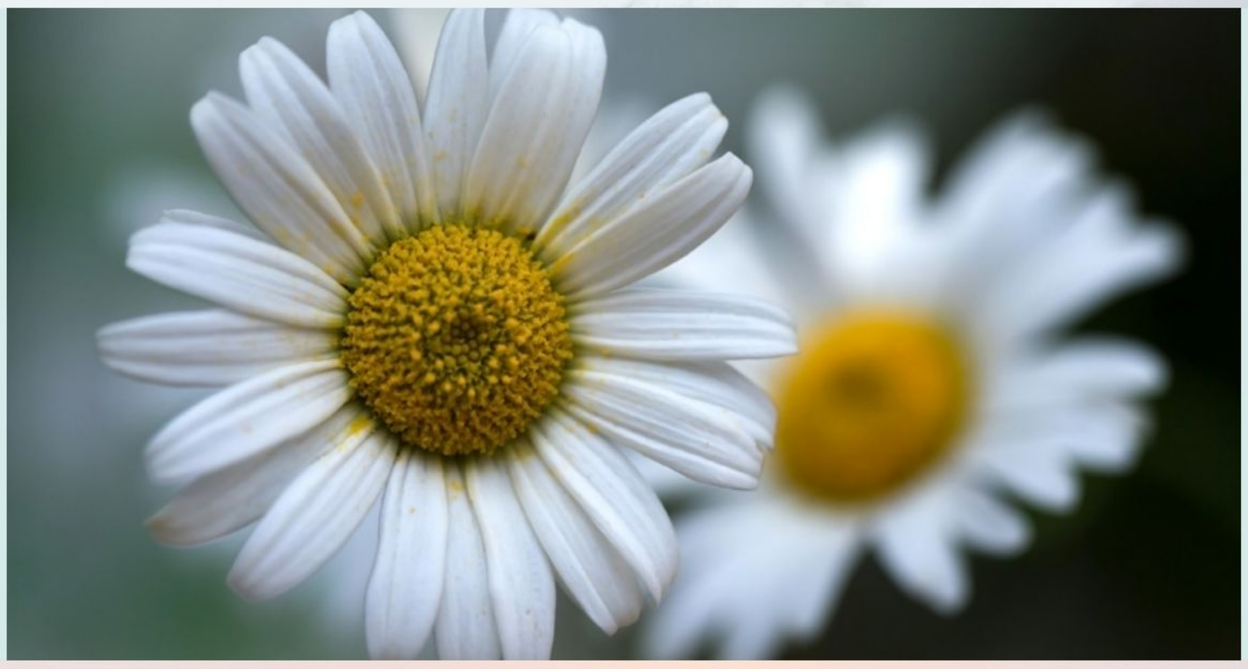
Early bird

Shooting a landscape in bright midday sun is fine but if you really want your shots to shine, you'll need to get up early and catch the light available just before the sun rises. The shadows are long, giving definition to objects and the light has that special golden ethereal quality. The same is true at the opposite end of the day, at sunset. The period of time around sunrise and sunset is called the golden hour. Simply switching the time you take photos can have a dramatic improvement on your shots.

5

Visual interest

The rule of thirds is a simple guide that can help the composition of your shots and make them much more visually appealing. When framing a shot, you have to imagine that what you can see through the viewfinder of your camera is divided into thirds both vertically and horizontally with lines, just like a noughts and crosses game (or tic-tac-toe if you are in the US). Placing your main subject on an intersection where these lines meet is a simple and quick way to improve composition.



6

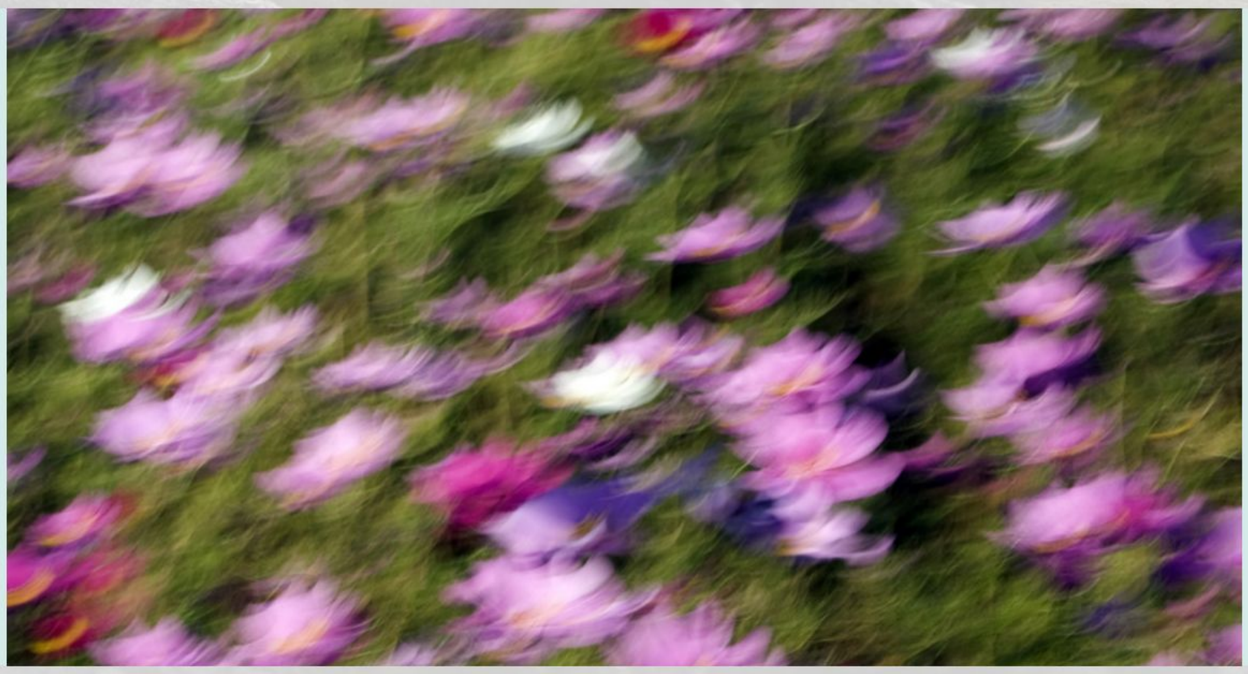
Pick a prime

Fast glass has very large apertures, letting in more light and offering faster shutter speeds in low-light conditions. A good portrait lens that has a maximum aperture of f/2.8 - f/1.2 is fantastic at creating the background blur so sought after by photographers. The quality of defocused light this blurring produces is referred to as bokeh. The ability to shoot at f/1.2, for instance, means you can shoot more natural light portraits, without the reliance on strobes.

7

The holy trinity

ISO, aperture and shutter speed are the three pillars of exposure. The main idea is that altering one of these three settings has an impact on exposure and therefore how your image looks. One or both of the other settings will have to be altered to maintain a balanced exposure. As you develop as a photographer, you will realise that once you are in control, you can create images that look more as you want, rather than what the camera thinks is right when in full auto mode.



8

Stop the shakes

Camera shake is the unwanted movement of the camera during an exposure. Modern cameras offer image stabilisation and it can work well up to a point but the lower the light, the more the likelihood is that your shots will be blurry as you need longer shutter speeds to gather enough light for a balanced exposure. If you buy one thing to go with your new camera, make it a tripod. Use a robust tripod and your images will be rock steady in all manner of challenging shooting situations.

9

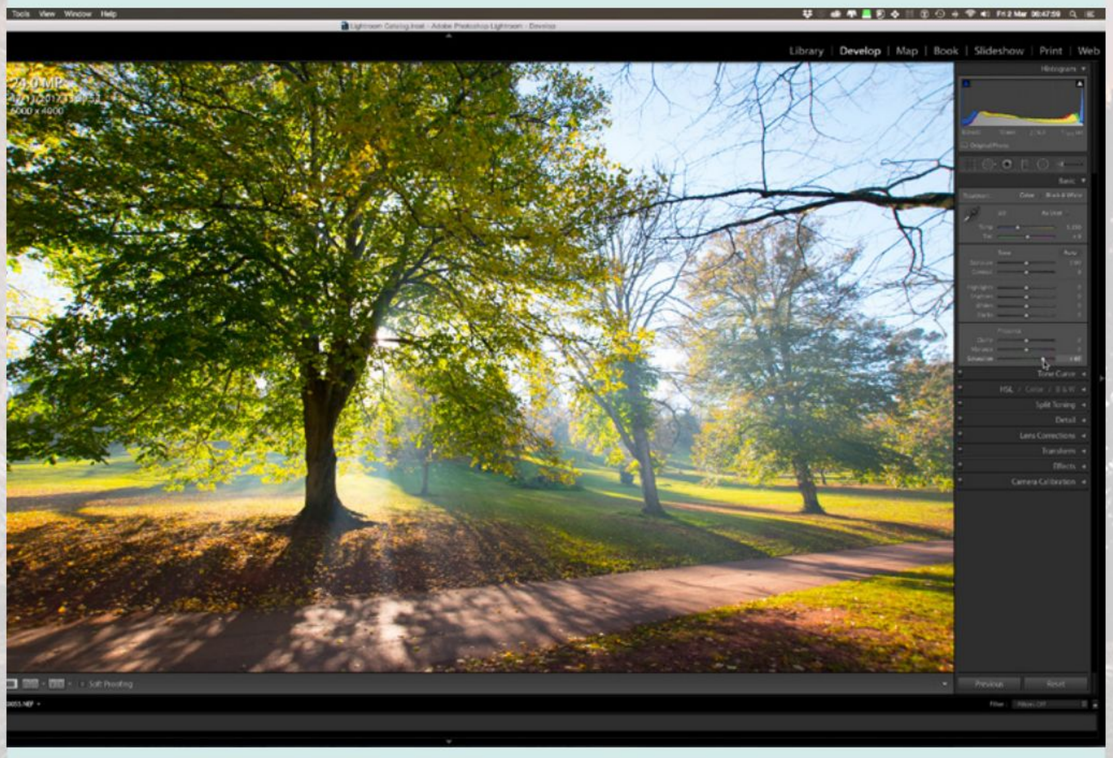
Depth cueing

A photograph only has two dimensions and any indication of depth in a photograph is purely optical. One of the simplest ways to add depth is to use leading lines like the curve of sand on a beach image or railway lines converging towards the horizon. Another method is atmospheric perspective where mist and fog shroud distant objects making them lighter and with less tonal contrast compared to darker foreground objects. This creates more depth in the image as darker foreground fades to lighter background.

10

Enhance your photos

If your camera has the option to let you shoot Raw images, use it. A Raw image is the key to much greater post-processing possibilities. Raw images, as the name suggests, are just unprocessed raw data straight from the camera sensor with all the information you need to bring out a beautiful photograph. The act of cropping the shot into a more pleasing aspect ratio can save an image, as can turning it to black and white. The choices are endless, even if it's just contrast, saturation, brightness and sharpness.



11

Are you compensating?

As good as cameras are, they will often overexpose and underexpose your photos in challenging lighting situations. That's where exposure compensation comes in. It's a common setting found on digital cameras and it lets you override the camera by making the image lighter or darker based on how much positive or negative exposure compensation you dial in. A lot of cameras will let you preview the result on your LCD screen and once you are happy with how it looks, you can take the shot.

12

Don't fear the histogram

Available on many modern cameras, a histogram is a graphic representation of the tonal values in your shot and how they are distributed. If the graph is bunched at the far left, then your shot is very underexposed and you risk the loss of a lot of detail to shadow areas. If it is sliding off the right hand side, then it will be overexposed and detail will be lost in the highlight areas. A good exposure will have all the major tones in the middle of the histogram.

13

Learn from others

Even the best pros had to pick up a camera for the first time. There are any number of photography forums that you can join and then get advice from other photographers. Why not join a local photography club? It's a great way to meet fellow like-minded photographers of varying skill levels. It's is also a good way of getting motivated to get out and take more photos. You're also more likely to be able to chat with those who are well versed in using software to post-process their images.

14

Further afield

Find a lovely location that you want to photograph and get yourself out there. Plan to arrive before dawn and get some amazing shots of the golden hour. Explore the area and experiment with composition and camera settings. In fact, just go crazy and enjoy the experience. That's the key to photography. It's there to be enjoyed. Don't worry about making mistakes; keep those shots and review them when you get home and figure out why they didn't work, it's all part of the process.

15

Out of the shadows

While a bright summer day may seem like the perfect time to take photos, at midday every scene will appear flat and featureless with shadows sitting directly beneath every object. The perfect weather for outdoor photography is a bright day with a few white clouds to help diffuse the light and take the edge off the shadows. The perfect time is around sunrise and sunset with long shadows defining the contours of the land.

16

Batteries

Your digital camera can't operate without power, so make sure you fully charge the battery before taking it out for the day. If you're going away for a holiday remember to take your battery charger and an adaptor for foreign mains sockets; and maybe consider investing in a spare battery or external battery pack in case you can't charge it for a while. There are also several devices available that can charge your battery using solar energy or from a hand cranked mini-generator.

17

A sense of perspective

An average human is viewing the world from their eye level of about 5 feet. Simply changing that viewing angle can radically alter the shot. As a simple rule of thumb, shoot from low down, shoot from high up. Getting above or below your subject alters how you present your subject and how they fit in the world that's around them. You can play with wide angle shots or telephoto shots. You have an amazing amount of choice. Anything to break away from the eye level world that we are used to.

18

Maximum exposure

For some extra creative clout, consider using longer exposures in your landscape shots. Photographers often employ exposures that last seconds or even tens of seconds, to show clouds streaking across the sky rather than looking static and puffy. Scenes shot with a much longer exposure will turn the water to a misty, milky fog. It is safe to say that your tripod is the key to the success of these shots.

19

Lock it up

For extra tripod stability, a lot of photographers hang their camera bags underneath the head of the tripod to act as a counterweight, helping to immobilise the tripod. In addition, even the movement of your camera's mirror flipping up and down with each shot can create vibrations that affect a shot's sharpness. If you set your camera for mirror lock-up, it will flip the mirror out of the way long before the shutter opens to take the shot, giving time for any vibrations to cease.

20

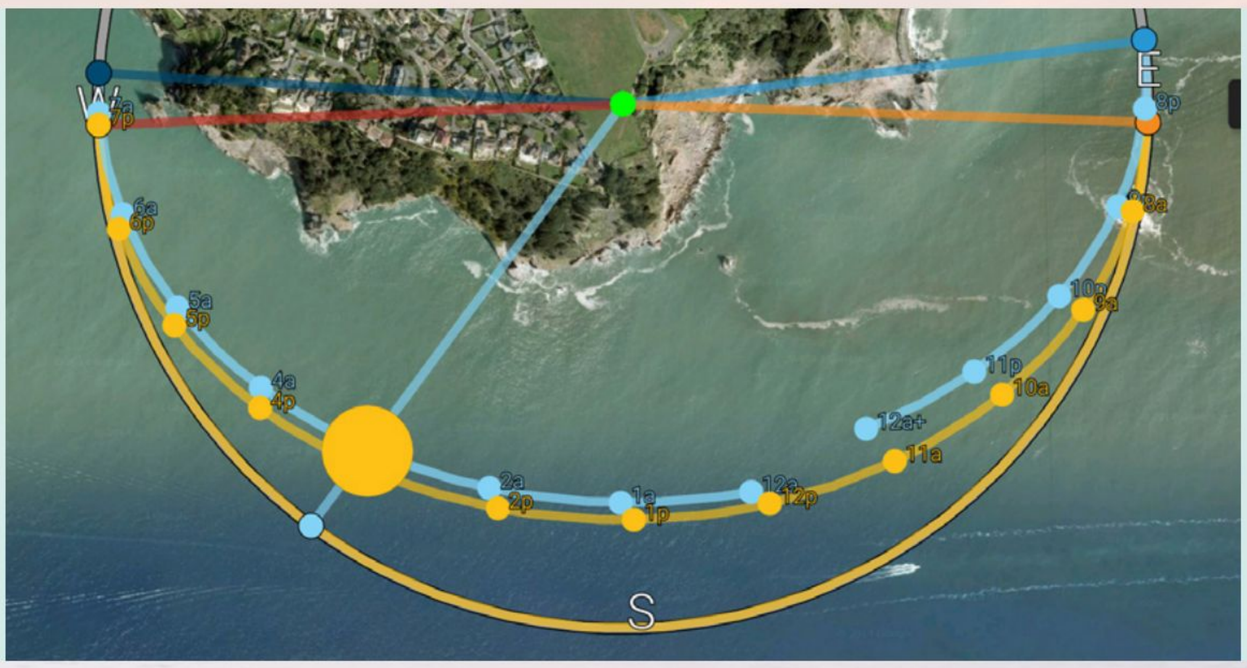
Filter systems

Think about investing in some filters. A circular polariser is very useful. It can boost the contrast in blue skies and is very useful for reducing or even eliminating reflections in water; just be aware that polarisers work best when the sun is at 90° to you. If you are shooting a scene where there is a large difference in the tonal values between your land and a bright sky, an ND grad will help stop those skies from burning out.

21

There's an app for that

There are apps available that can tell you where the sun will be at any point on any given day. These apps can overlay information on a map of your given destination, showing where the sun will rise and fall and where it will track through the sky on whichever day you choose. This is great for working out what time is best for you to shoot in the location you are researching. Sunseeker for iOS and Sun Surveyor for Android are two great examples of these types of app.



22

Take control

If you are relatively new to DSLR photography, you may still be using your camera's auto or semi-auto functions where it will decide on the best settings to use in either Shutter Priority or Aperture Priority. As long as it is in auto, it will keep making decisions for you and you will end up with shots that don't match your expectations. In manual mode you can decide on how the scene is exposed. Make the creative decisions; don't leave it to your camera.

23

Stay sharp

Photographers will want their scene to be as sharp as possible from front to back. This is where depth of field comes into play. At large apertures such as f/2.8, the area of sharp focus in front and behind the point of focus will be relatively small. Using a much smaller aperture such as f/11 that 'zone' of sharp focus is much greater. As a rough guide, focus on a point about one third of the distance into your scene to give yourself the best chance of maximising the depth of field available.

24

Persistence pays off

The great outdoors is unpredictable to say the least. The weather has a habit of doing exactly the opposite of what you want, when you least want it to. This can be a big turn off for many new to photography. Don't let below par weather put you off. Sometimes you have to be brave and get out there and be prepared to sit and wait. You could be rewarded by a break in the weather that reveals some sublime lighting that makes it all worthwhile.

EXPLORE FURTHER

We present some more detailed photographic fundamentals

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Good photography is equal parts creative flair, a good eye for composition and technical ability. There is no mystery to taking a good photo and we all have the ability to capture something cool, meaningful or just plain 'wow' if we have a good grasp of the fundamentals. The previous pages in this title have given you a basic understanding of these fundamentals, but we wanted to expand on a few of them and introduce you to more useful techniques and tips too. As far as we are concerned, you can never have too much information at your fingertips to aid you in your endeavours. As lovers of photography ourselves, we want you to be the best photographer you can be. Grab your camera and fire up your passion.

Over the next few pages, take a look at the hints and tips provided. There is a lot of good information that will hopefully take your creative skills in new directions or just help you brush up on certain aspects of your craft that were in need of a quick tune-up. For example, sometimes, the simplest quirk of a digital camera can frustrate and annoy new photographers who don't yet understand why their camera is behaving the way it does. Other times, you my not know quite how to approach capturing a landscape, shooting a portrait of a man or woman, or how to begin shooting macro. We have the lowdown on this and more. ■

"There is a lot of good information that will hopefully take your creative skills in new directions or just help you brush up on certain aspects of your craft that were in need of a quick tune-up."

Mastering exterior lighting conditions

Be the master of good exposure with our handy guide

For many, stepping out from behind their cameraphone and shooting with a DSLR, can be a big deal. Make no mistake, cameraphones are amazing, for what they are, but for us, there is nothing to match working with a DSLR and getting immersed in the process of attaining the best exposure of your subject. If you love to shoot landscapes, but often find that the exposures never seem to give the results you expect, don't worry. Landscapes can be a bit tricky to meter correctly and you will often fall prey to the behaviour of the camera's metering system in different lighting conditions. It is very likely that the scene you are photographing will have more tonal range than your camera can capture and therefore fall outside an average metered setting. Here are a few pointers that can help you with various lighting scenarios. ■

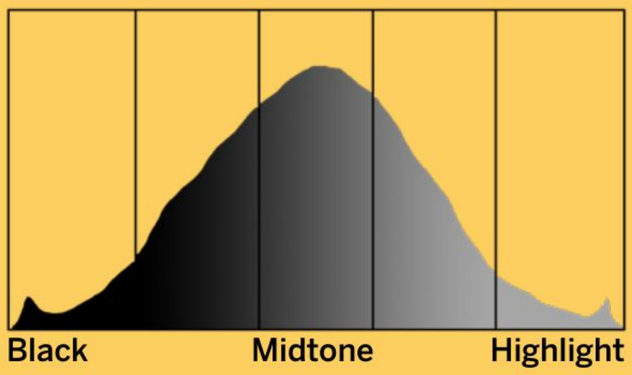
"If you love to shoot landscapes, but often find that the exposures never seem to give the results you expect, don't worry."

Bright, full range

In evaluative metering mode, on a bright sunny day, you may find that the image captured is fairly accurate in its representation of the scene, since there is a full spread of tones from lightest to darkest.

The histogram should show an even spread throughout the midtone range with perhaps some small spikes at the highlights and shadows end.

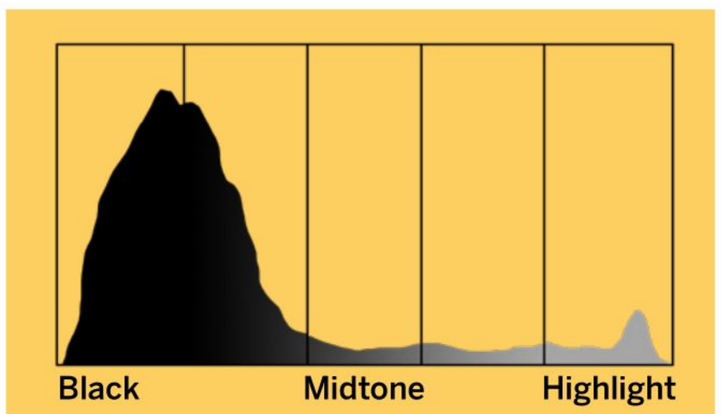
Depending on your creative approach, you may want to dial in a small amount of positive, or negative, exposure compensation.



ISO: Set low
Metering: Evaluative
Exposure Compensation: Only if needed

Dark scene

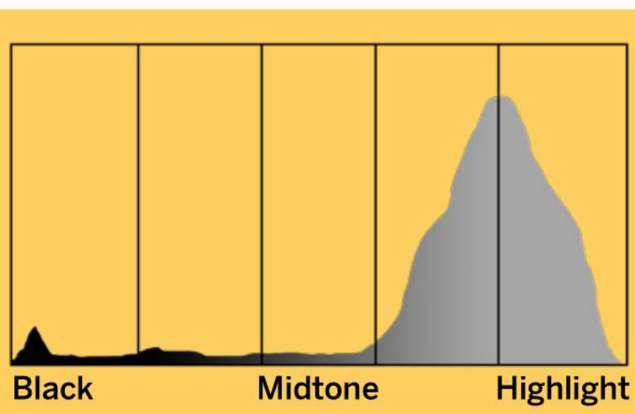
A darker, low-key scene, such as an evening shot near dusk, will be metered in a different way. When a camera's meter averages a scene, it assumes that the average of all the tones will be equivalent to an 18% grey reflectance value. Since a darker scene, by its very nature, is darker than that, the camera will overexpose the scene to achieve that 18% value. You will need to dial in about -1 or -2 stops of negative exposure compensation to get the exposure back down to an acceptable level. Your histogram should show a greater distribution of tones in the shadow areas on the left of the histogram.



ISO: Set low
Metering: Evaluative
Exposure Compensation: -1 or -2 stops

High-key scene

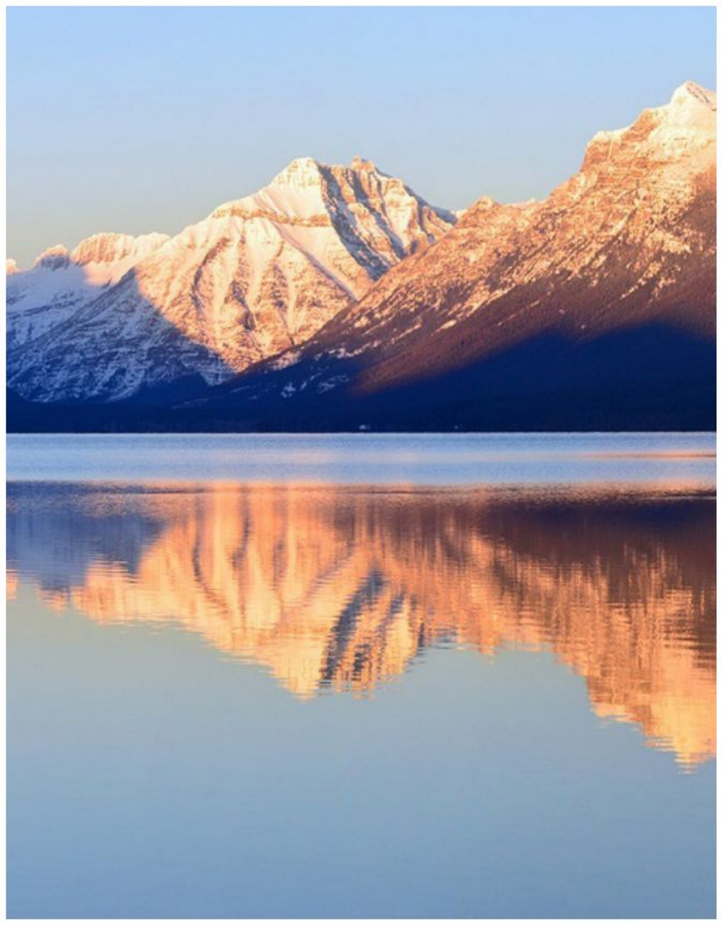
A high-key scene is bright with very little in terms of shadow areas. Winter scenes or bright beach environments are good examples of this. Whereas a dark scene is metered for 18% and overexposed, it stands to reason that very bright scenes will be underexposed, since the camera's meter is now trying to darken the overly bright scene to get it down to 18% reflectance. This can make images look dark and muddy. In this case, you will need to dial in anywhere between 1-3 stops of positive exposure compensation, in order to return the image to full brightness again. Your camera should now show a high distribution of tones in the highlight areas on the right of your histogram.

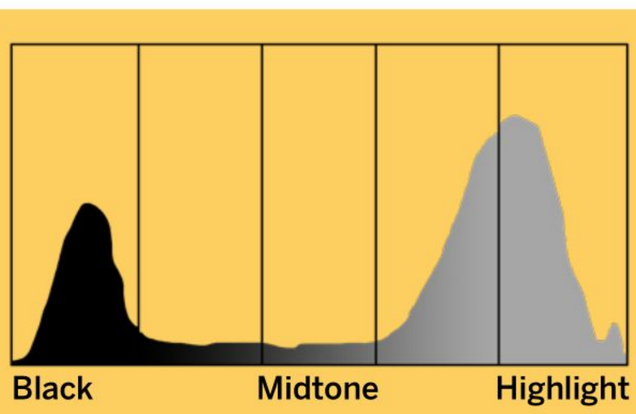


ISO: Set low
Metering: Evaluative
Exposure Compensation: up to +3 stops

High contrast

Scenes of high contrast, such as bright skies with dark foregrounds, can be a little more confusing to the metering system on your camera. Depending on how much the highlights dominate the scene, it may underexpose. If there are far more shadows in the scene, it may overexpose. You can choose to take a test shot and simply adjust your exposure compensation accordingly, or you can use the spot meter and place it on a middle tone area of the scene to get a more accurate metering of that part of the shot.



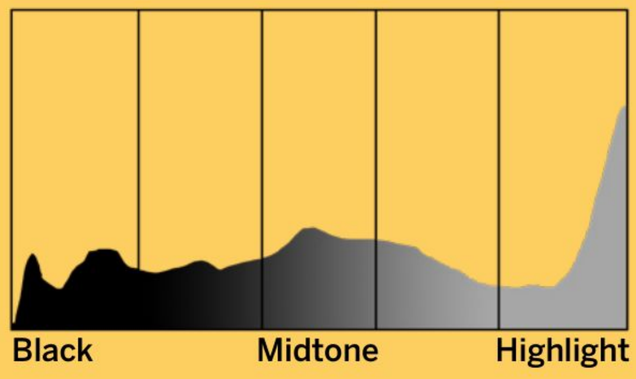


ISO: Set low
Metering: Spot
Exposure Compensation: Check in situ

Backlit, low contrast

Low contrast scenes will probably require you to use spot metering, as you did with the high contrast scene.

You can place the spot meter on an area away from the brightest, or darkest, areas of the shot and meter from that. Again, depending on personal preference, you might want to add positive, or negative, exposure compensation, if you feel it is required.



ISO: Set low
Metering: Spot
Exposure Compensation: Check in situ

How to photograph women

Some handy tips to bear in mind when shooting a female portrait

As a photographer, if you are ever required to create portraits of women, there are a number of key factors that are worth bearing in mind. If both you, as the photographer and your subject, as the model are not experienced professionals, then knowing how to pose for a photograph is the thing that will make or break your image. All the best lighting, exposure and composition in the world will not save the image if your model looks awkward and unhappy. Here then are a few helpful hints to get your female portraits looking professional. ■

> "All the best lighting, exposure and composition in the world will not save the image if your model looks awkward and unhappy."

The curve

It is considered flattering for a subject to angle their body away from the camera, rather than square on to it. It creates more visual curves and shapes, complementing the model. It certainly helps the subject to look less stiff and awkward and less like they're posing for a police mug-shot. Try and avoid any part of the body creating a straight line; straight lines will make your model look rigid and uncomfortable.

Relax

Posing arms and hands can be a tricky one for an inexperienced model. Basically, arms and hands need to be kept relaxed. No fists, as this can create tension in the hands and arms. The arms themselves should be kept slightly away from the body to try and avoid the 'soldier at attention' stance, as well as keeping the pose relaxed and natural. Pushing hands forward towards the camera can make them appear larger in relation to the rest of the body, so watch out for that.

The neck

The neck of your subject is a key body part that can affect the shot quite considerably. If they don't stretch out their neck slightly and draw their head forward, there are chances you will create unwanted shadows and unsightly creases in the neck. Be aware of asking your model to turn their necks in such a way that generate too many of these wrinkles from neck to shoulder.

Stand up

In a standing pose, legs should generally not be held straight. For a woman, the classic standing pose is to place more weight on the back leg, while bending the front leg and pointing the toe at the camera. Crossing one leg in front of the other can also create some visual lines that are flattering and pleasing to the eye.

Look back

The over the shoulder look is another classic pose that is quite easy for an inexperienced model to achieve. These images are very flattering and can also look quite enigmatic and classy. They can engage the camera with eye contact, or look away in different directions. Just watch out for neck wrinkles again. Don't ask the model to over rotate their head or you run the risk of looking like something out of an Exorcist film!

Framing

If the model's face is the subject of a close-up photo, they can place their hands around their face to frame it. The model can use one, or both, hands and rest them on the face, softly touching it. The hand can also be used as a means of propping up the face if they actually rest their head in their hands.

Lying down

For a little more intimacy in your female portraits, you can ask the model to lie down. They can choose either to look directly at camera, for more confident looking photos, or perhaps look away or close their eyes for more wistful images. If you get them to lie with their body angling away from the camera, then that also has a flattering effect.

Take a seat

If you want your model seated for some photos, try to avoid a rigid, straight back. Remember; curves work. Ask her to bend her back slightly to either open out the pose, or close it in. Keeping one leg bent is another key factor in making seated poses work. The bent leg can also provide a support on which to rest a hand or arm.

How to photograph men

Male portraits have their own special kind of language when it comes to posing

Since we have just discussed how to photograph women, it seems only right to pass on a few tips about how you can photograph men and produce great portraits. The general rules for men are slightly different in approach than those of women. As with women, if your male subject is not an experienced model, then they are likely to turn to you for guidance and you can help them out by knowing some of the basics and hopefully give them some confidence in front of the camera to get your shots looking next-level awesome. ■

> **"The general rules for men are slightly different in approach than those of women."**

Angles and lines

The first major difference to be aware of when photographing the fellas is that you actually want to be able to emphasise lines, angles and strong, rigid, shapes. Curves on men are not considered flattering. You are looking for masculine poses that work to produce strong form in the jaw, back, arms and legs.

Square shoulders

You really want your male subjects to stand tall and proud in their photos. Squaring the shoulders and pushing their frame up a little works really well, also ask them to lean in slightly towards the camera. Just make sure they keep their frame tight and don't slump their ribcage down onto their belly. In some cases, breathing in slowly and holding a lungful of air helps to keep the core nice and tight. Unlike women, there is no real issue with men standing square to the camera with a strong pose. As with everything though, experiment with the poses in which both you and your subject are keen.

Double chin

For men, the double chin can be a very unflattering look. When posing your subject, make sure they push their chin and jaw forward and lift the head slightly. As with the ladies, it helps avoid neck wrinkles. A head down pose with eyes looking up at camera will result in that extra chin if they bend their neck and collapse their jaw too far onto their chest.

Legs

With legs, the rules are generally the same as with women. Try to avoid very straight legs. The leg furthest from camera is usually the one you would ask the model to put their weight on. The leg closest to camera can be more relaxed and he can bend it more. In the fashion industry, that rule for men and women is often broken with the models standing in almost superhero-type poses. For the rest of us mere mortals though, looking relaxed is the way to go.

The lean

For subjects that are a bit awkward and finding it hard to relax, getting them to lean on something can often help. A railing, wall, or counter top in a bar, it doesn't matter. Get them to lean on it and one leg will naturally want to bend a bit, or actually cross one leg over the other. The other hand can go in a pocket if needed, or rest over the top of the arm that's leaning on the available surface.

At ease

For a lot of inexperienced models, knowing what to do with their hands is a skill best learned early on. For men, the correct placement of hands can show a sense of confidence. For example, asking a man to fold his arms over his chest or put his hands in his pockets is quite a natural thing. It looks great for men in a photo and will usually help relax your subject. The hands themselves need to be watched; stiff hands betray a nervous model. The odd prop, such as a jacket thrown over the shoulder, is also a useful device for more natural posing.

Sit down

Sitting is another natural and relaxing pose for a man. Hands can rest in the lap if needed and you can cross their legs. If they are sitting on stairs, they can draw their legs up to a level where they can lean forward and place one or both arms on the tops of their legs. Hands can be folded together or one hand can rest in the lap. They can also lean in towards the camera. It looks a confident pose and is often seen in many lifestyle photos and clothing/fashion images.

One up, one down

In addition to the sitting poses already mentioned, men can also do the one leg up and one leg down pose. Depending on how far up the bent leg is drawn, an arm can be draped on top of it. If you also have a man standing and leaning his back onto a wall, one leg can be drawn up into a bent position with his foot flat against the wall.

Go wild with your landscapes

Some great advice on capturing the perfect landscape shot

Landscape photography is probably one of the most accessible forms of photography, since landscapes are all around you. They will happily sit still, allowing you get the best shot available during the varying hours of both daylight and night-time, and they present an ever-changing subject. However, despite its accessibility, capturing those 'wow!' shots can be another matter. It takes a bit of dedication and perseverance to get the perfect landscape, so here are a few pointers to set you on your way. ■

"It takes a bit of dedication and perseverance to get the perfect landscape, so here are a few pointers to set you on your way."

Light matters

The vast majority of photographers will agree that the best time to shoot is during the first 45 minutes before sunrise and about 5 - 10 minutes after it has risen. Before the sun rises, the land has very low contrast and the light is soft and almost mystical in its feel. As the sun gets over the horizon, it casts very long shadows that reveal detail and texture, giving a better three-dimensional quality to your photos. The last 20 minutes before the sun has set are also great, particularly for fiery red sunsets (if there is a lot of dust in the atmosphere). Then, in the first 45 minutes after the sun has set, the contrast drops again giving you deep shadows.

A sense of scale

Sometimes it is difficult, when not viewed in person, to appreciate how vast a scene really is. To overcome this, try and include a foreground element that gives the scene a sense of scale. A boat on a lake is a good example, or an abandoned barn on some wild vista. Even people are useful props to add scale. A mountainous image is suddenly more powerful if you have a person standing in the near foreground, taking in the view and giving you that sense of how huge the environment is. It is not uncommon to try and keep the figure as a silhouette; therefore making them stand out from their surroundings.

Longer exposures

Both pre-dawn and for about an hour after sunset, you can usefully start to employ longer exposures to get any moving objects, such as water or clouds, to take on an ethereal quality. This means even without ND filters, you can drive up exposure times and still reduce water to mist and clouds to mere wisps.

Pause to reflect

Although it is often said that you should use the rule of thirds when composing your images, there is one time when you can break that rule. A landscape that incorporates a flat body of water is an ideal candidate for placing the horizon dead centre in the frame and using a long enough exposure to totally flatten the water, creating a glassy surface that flawlessly reflects the landscape above. A mountain range, with a lake in front of it, seems all the more impressive when it has its doppelgänger caught in the watery reflection.

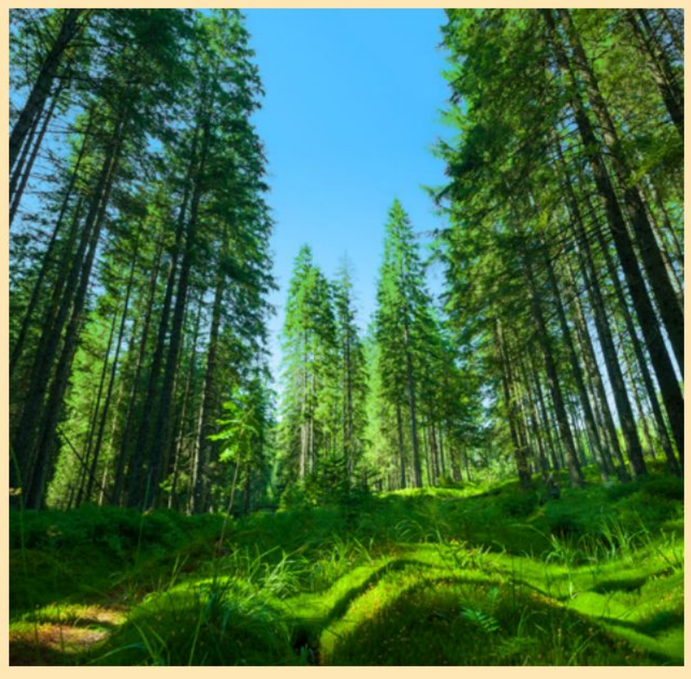
Whatever the weather

Try not to be a fair weather photographer. Clear blue skies do not necessarily make for the best landscape shots. Many photographers love clouds and how light plays upon them. Sometimes, the most dramatic cloud formations can be found just before, or after, a storm. Okay, It can result in you being caught in a deluge, but if you are prepared to get wet (needless to say, keep your kit dry), then you are likely to get some amazing views.

Move it

This is something we've mentioned before and it's still a very valid point. Don't always presume to take photos of your landscapes from human eye level. Seek out new points of view and camera angles.

Dropping your camera to the floor is easy enough and a forest scene can be all the more imposing when viewed from a low angle. Shooting from high angles can also add that lovely creative difference to your images.



Macro photography

Are your subjects ready for their extreme close-up?

If you have never attempted macro photography before, you may be forgiven for thinking that it is a very specialised photographic subject. While that is true to a certain degree, there are plenty of ways you can dip your toe into the subject without having to spend large amounts of cash. Macro photography remains one of the more popular genres and if you take a look through any photo library or image sharing sites, like Flickr, you will find any number of groups dedicated to this fascinating subject. Now, let's talk about the types of equipment you can try out to begin your first foray into the macro world. ■

> "Now, let's talk about the types of equipment you can try out to begin your first foray into the macro world."

Gear choices

First and foremost is going to be the macro lens. These prime lenses are constructed to enable you to shoot your subject from very close distances, as well as operating like normal lenses. They typically have very large maximum apertures of around f/2.8, which when working at its closest focusing distance to your subject, can give you extremely shallow depth of field. Macro lenses are rated by their ability to resolve an image on your sensor at 1:1 magnification. What this means is that if your sensor is 35mm x 24mm in size, you can fill the viewfinder with an object of the same size - hence 1:1 magnification. The longer the focal length of your lens, the greater distance you can put between yourself and the subject, whilst still maintaining 1:1 magnification. Macro lenses vary in price, but if you aren't sure whether you want to spend out on a lens just yet, there are other options available to you.

Close-up lenses

In essence, these lenses behave like a magnifying glass added to your main lens. They screw on the front and optically reduce the minimum focusing distance, so you can get closer to your subject, thereby effectively increasing magnification. If you want greater magnification, you can put the close-up lens on the front of one of your longer focal length lenses, giving you the ability to fill more of the frame with your subject.

The extension tube

As the name suggests, an extension tube is screwed on to your camera and then your main lens is screwed onto that. They increase the focal length of your lens by moving the lens further away from the sensor and much closer to the subject. The upshot is that you get more magnification and the ability to focus much closer. The extension tube offers greater close focusing than a close-up lens and turns your main lens into something that is almost behaving like a true macro lens. Extension tubes are also a cost-effective option if you are thinking about trying macro photography.

Turn around

Another slightly more unusual approach to macro-work, is to try a reversed lens ring. One side of the ring attaches to your cameras lens mount and you attach your main lens to the other side. Meaning you can actually turn your lens around 180°, attach the front element to your camera and then use the rear element of the lens as the front element instead. Depending on the lens you use, you can actually magnify a subject by about 300%. This is another inexpensive option; the only drawback is that you need to be aware of not scratching, or contaminating, the rear element of your lens.

Natural light portraits

You don't need an expensive studio to get some great portrait shots

Taking photos of landscapes is one thing, but when you decide it's time to get involved in portrait photography, it can seem quite a daunting prospect. You might imagine it requires armfuls of expensive equipment and lots of lighting gear. Don't worry; there are a few simple things that you can try to see if portrait work is for you. Indoor natural light is certainly a great and easy way to dip your toe into the portrait world. There are a few basics to be aware of, but it's nothing that a photographer of any skill level can't handle. ■

> "There are a few basics to be aware of, but it's nothing that a photographer of any skill level can't handle."

The camera

For most applications, the camera can be anything from a simple point and shoot up to a pro level DSLR. One consideration, that elevates portrait shots from the ordinary, is lens choice. A lens that has a large maximum aperture will give you two major benefits: Firstly, since you are in an indoor, natural light environment, there may not be as much light as you would wish and your shutter speeds may be quite low. You can boost the ISO of course, but you want to retain as much quality in your shot as you can. A wider aperture allows more light to enter the camera, giving you the chance to use higher shutter speeds and therefore reduce the risk of camera shake. The second benefit is more of an aesthetic one. Large apertures also have very shallow depth of field. This fact may be beneficial, when shooting a portrait, if you have a subject with a distracting background. Once focused on your subject, the background will be blurry and less intrusive.

The light

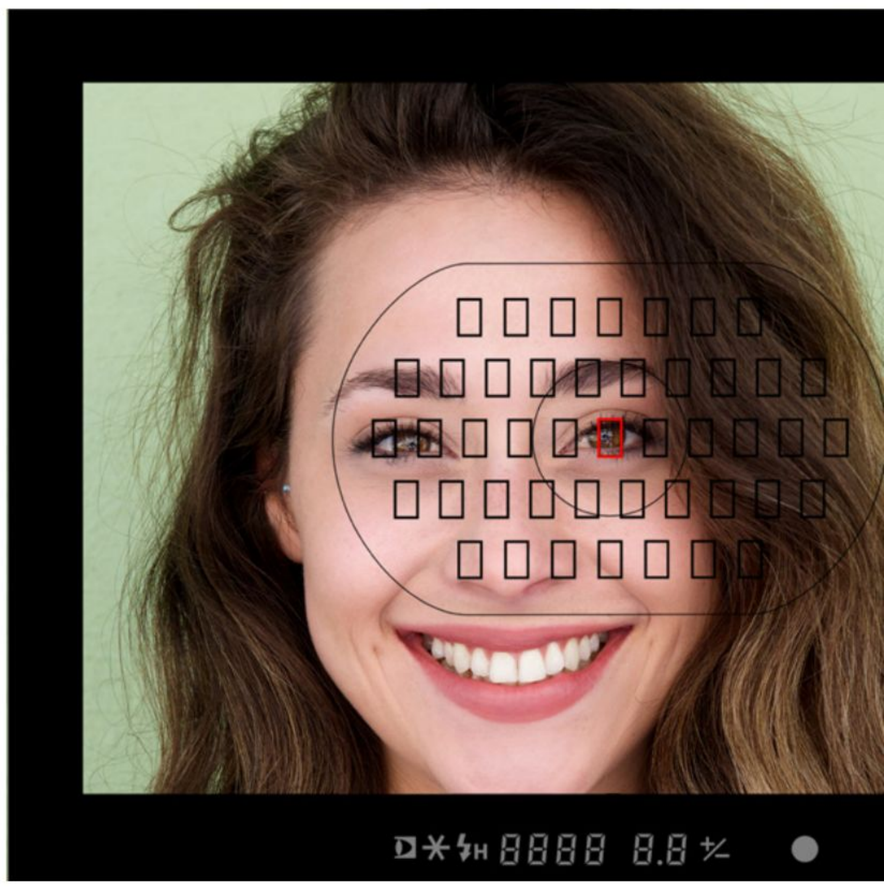
Natural light entering a room is your primary source of illumination. It can be as simple as a window, roof light, bay window, conservatory, or doorway. If the light source is near a plain wall then, if you need it, you instantly have a backdrop. If it is a harsh, sunny day and the light entering the room is very strong and directional, you can always hang a white bed sheet over the window to act as a diffuser and take some of the harshness out of the shadows.

The shot

Placing your subject relative to the light source is a creative decision, but start by trying shots where the subject is square on to the light. This will provide even illumination that keeps harsh shadows away. Avoid the light source dropping below their head level. Lighting from below is best used only in horror films! If you pose your subject at an angle to the light, you will start to create shadows that fall across the face away from the light source. This can help make features more three-dimensional. If the shadows are too dark, get some extra light in there by using a white sheet, or card, to bounce light into the dark parts.

Settings and technique

Longer focal lengths are more flattering for portraits. Using a wide-angle lens and getting closer to your subject will distort their proportions and make them look like they are reflected in the back of a spoon. Try focal lengths around 50mm-100mm for more flattering images. It is best to begin by setting the camera to your lens' widest aperture. Keep an eye on shutter speed. Nothing ruins a shot more than camera shake. Focusing is key to a good portrait. Always make sure you have the eyes in sharp focus. If your subject is turned to you at an angle, make sure the closest eye is the one in focus. Aperture priority works well in this instance, although you can go to manual mode if you are feeling more confident. Keep ISO as low as you can, but never let your shutter speed drop below 1/60s.



Bounce

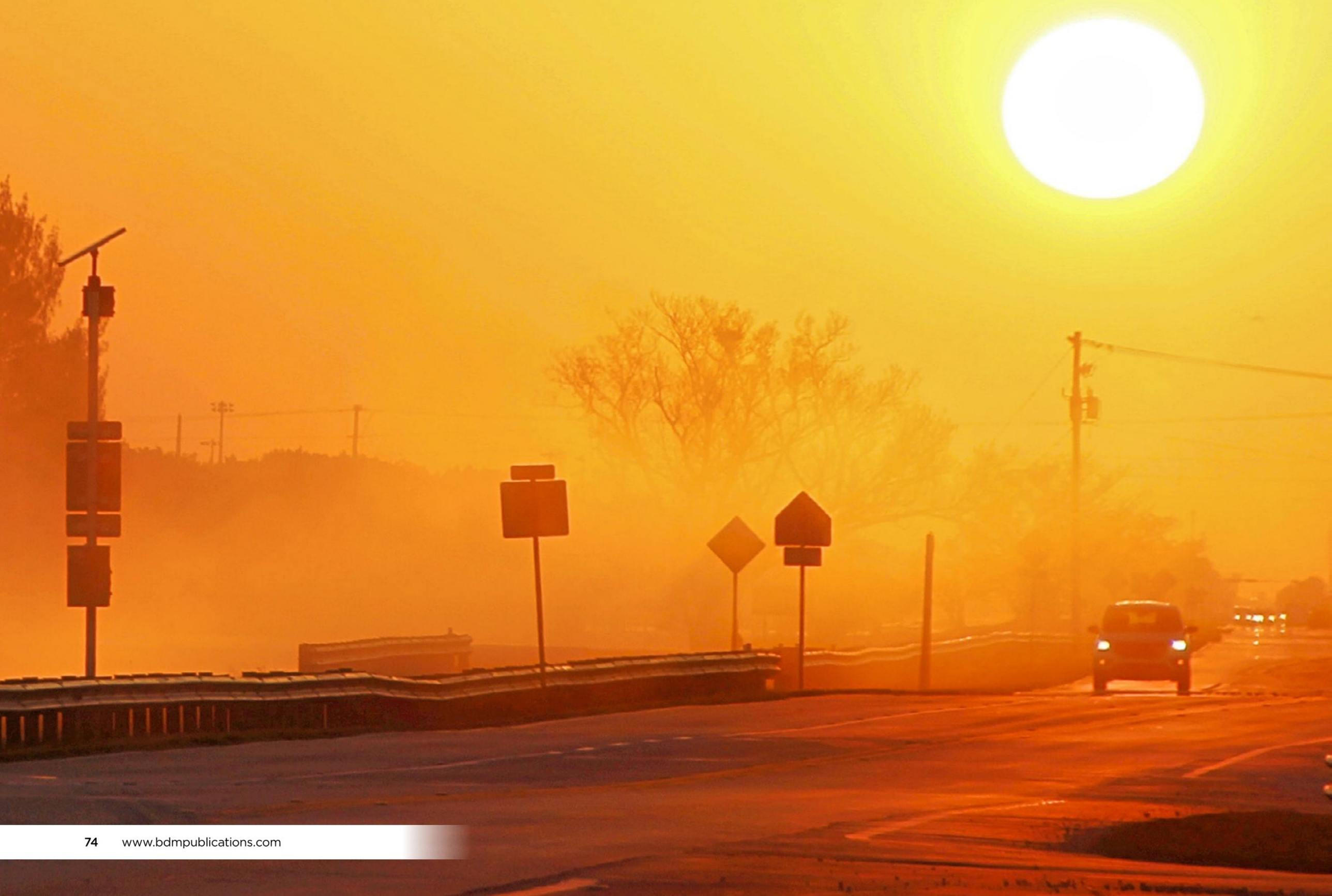
A large piece of white card is a very cheap method of creating a reflector. You can use defectors to bounce light onto your subject and create some extra fill light that can, if the light is too harsh, illuminate shadows. If you also happen to have some lamps in the room, you can employ them as simple secondary light sources. A bed sheet hung in from of them can soften their output if required.

Shooting amazing sunsets

Shooting into the sun can be tricky unless you have some helpful advice

Surely, we all love a sunset? A blazing red sunset is lovely to behold and can make for some great photos, if you know how to get the most from the fiery scene in front of you. Of course, good exposure control is paramount to ensure you capture as much of the tonal range of the scene as possible. Moreover, the scene itself requires a couple of things to make it a success from the point of view of composition. A clear sky does not necessarily make for a good sunset. Clouds are the perfect addition to reflect the light and create visual interest in the sky. Now that the sky is sorted, you will need some foreground interest, more on that shortly. ■

"Of course, good exposure control is paramount to ensure you capture as much of the tonal range of the scene as possible."

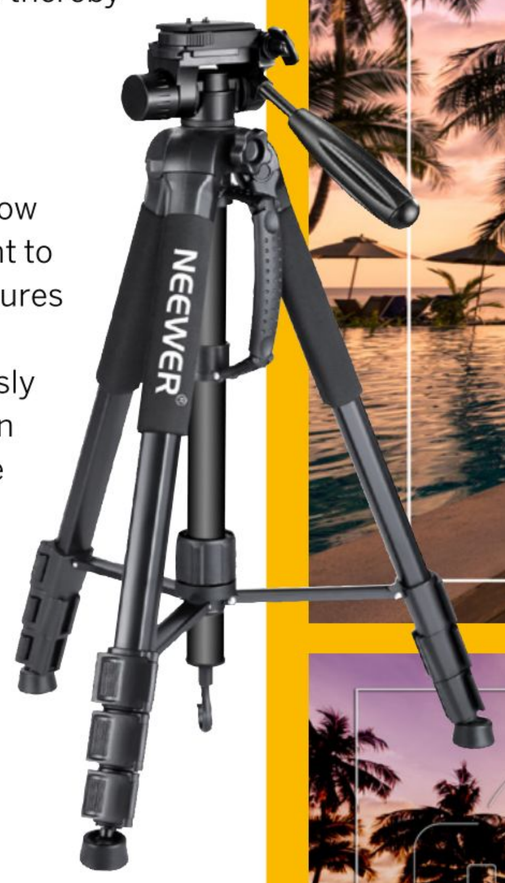


Get the settings right

If you are feeling brave, why not take the camera out of automatic mode and go full manual? It's not at all scary to do and it gives you total control over your shot. Simply decide your preferred ISO and aperture and then just experiment with the shutter speed until you get a good balance of tones in the shot. It is always recommended to keep the ISO as low as possible in the first instance, for maximum image quality. A low ISO keeps your photo clear of noise and grain. If you are shooting hand held and the light levels are dropping, then you may have to consider a higher ISO to give you faster shutter speeds and thereby avoid camera shake.

Stop the shake

Generally, a sunset scene, or any landscape image, is shot with narrow apertures to give you as much front to back sharpness as possible. Apertures such as f/11 and f/16 are the best starting points for this. As previously mentioned, while you're working on your preferred settings, make sure you are aware of your shutter speeds. If they drop too low for a handheld shot, camera shake is inevitable. Shutter speeds of 1/60s are a bare minimum to eliminate shake. Otherwise, get a tripod involved. We've probably recited this mantra way too many times, but getting a tripod is the single most important item to have, after the actual camera and lenses.

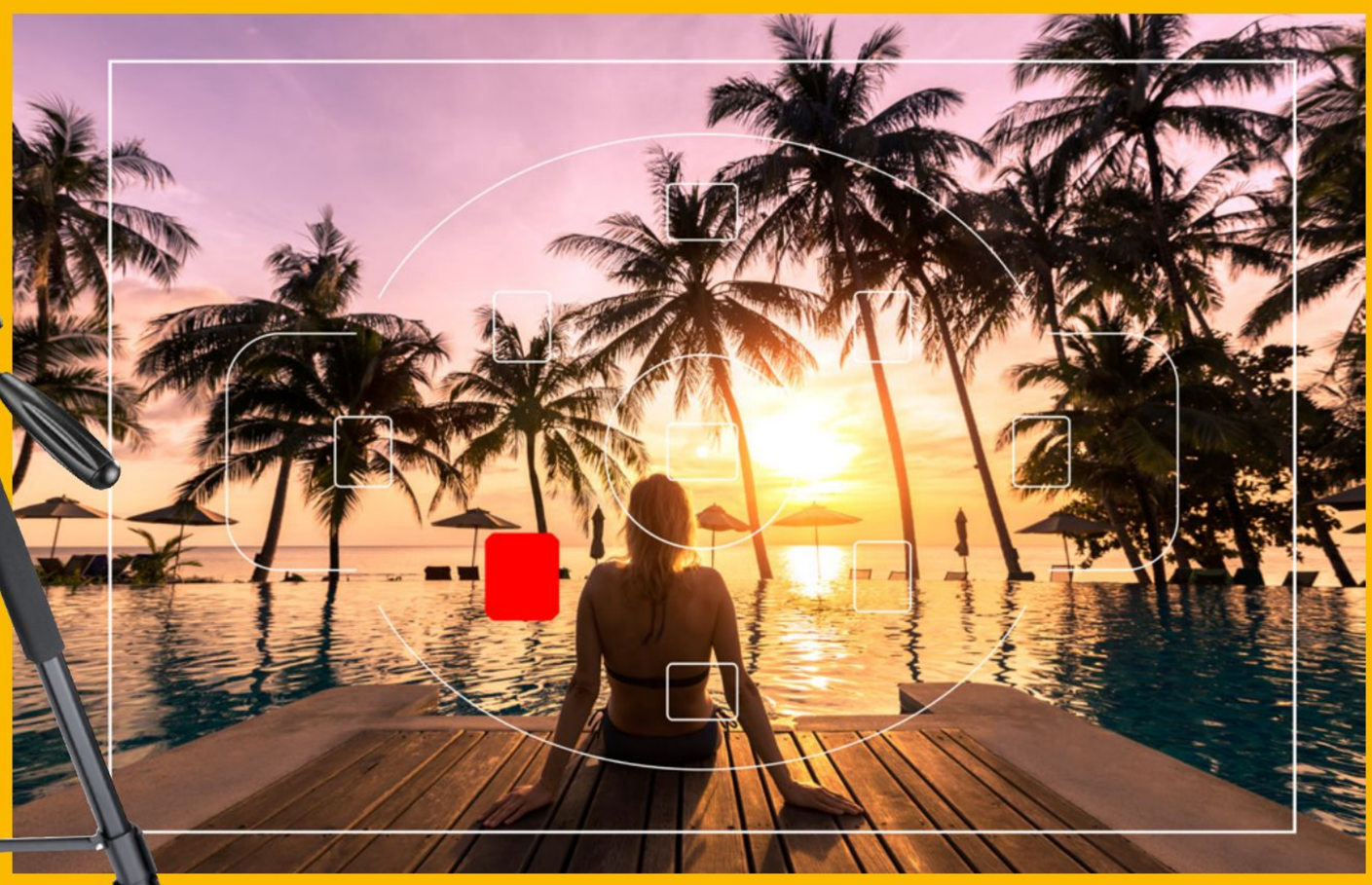


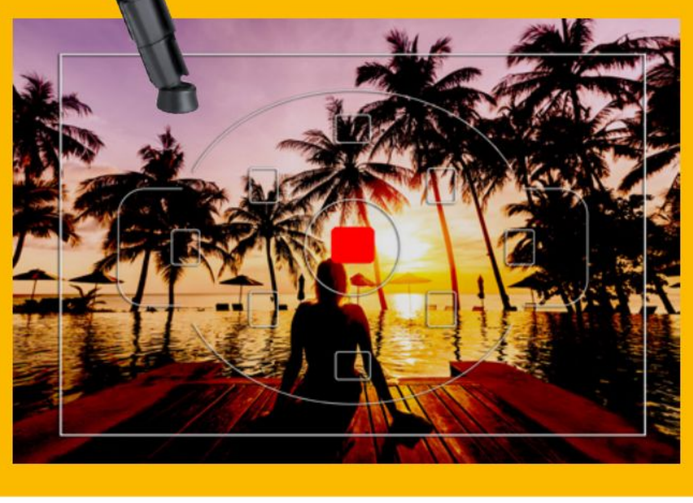
Filters

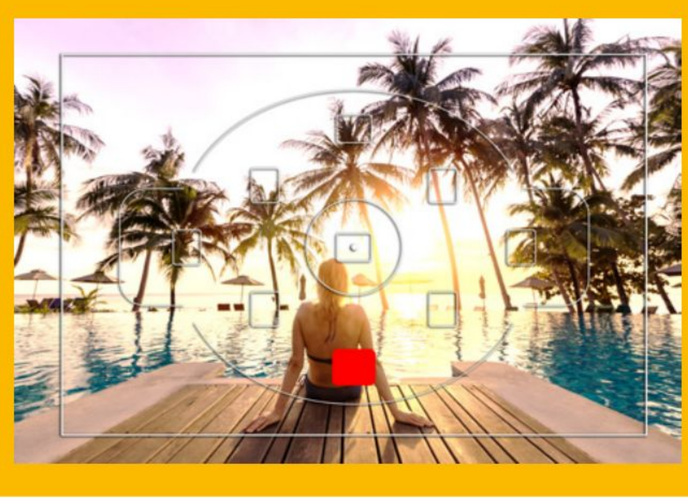
Another item of equipment we would always recommend for landscape photography is the use of certain filters; In this case a graduated neutral density (ND) filter. This is a square filter that sits in front of your lens and can darken the sky while leaving the ground at its normal brightness. These are great for overly bright skies that need to be toned down in order to create a balanced exposure.

Metering

If you want, rather than setting your camera to manual exposure and experimenting with settings, you can opt to use the camera's spot meter mode. If you use this, you can meter a very small part of the image (not the sun), that is a middle tone area, for a decent averaged exposure of the scene. Alternatively, you can actually meter a right point nearer to the sun's brightness and drop a lot of your scene out to silhouette. Beyond that, you can also choose to meter a darker area and really push the bright areas out to overexposure, if that is your creative choice.







Get the shot

So, we come to foreground interest. This is a key part of capturing a successful sunset image, or any landscape photo for that matter. Find something to put in the near foreground. A tree, a large rock formation, a boat on the water (if you're shooting near a body of water), it all helps to engage the viewer and give them a visual starting point when viewing the image.

Go hyperfocal

In landscape photography, there is sometimes mention of the hyperfocal point. This is a point in the scene that yields the greatest depth of field for any aperture setting and focal length you might be using. It does require some mathematics and knowledge about certain aspects of your camera, so for those of us in a bit of a hurry, focusing on a point roughly one third into the scene is generally good enough to get decent sharpness across a wide range.

Night photography

Time to try out the dark side of photography

Whether it's the lure of bright city lights, barren moorland bathed in moonlight, or a tumbledown barn in the country under a starry sky, night-time photography is a big draw for many photographers. It can be challenging, very frustrating and time-consuming, but it's a hard habit to break when you get such great results. You are normally dealing with much longer exposures than usual, while having to carefully compose and focus your shots and, as such, it forces you to slow it all down and take a much more considered approach. We have some helpful insights to lure you over to the dark side. ■

Tripod

This may sound a bit obvious, but if you want to take photographs where exposure times can sometimes be in the tens of minutes, you're going to need something sturdy on which to put your camera. You can, of course, set your camera to its highest ISO setting, open the aperture as wide as it will go and shoot handheld, but to really do the image justice you should invest in a solid tripod.

> "It can be challenging, very frustrating and time-consuming, but it's a hard habit to break when you get such great results."

Shield the lens

During the day, the use of a lens hood may seem quite obvious, but, sometimes, new photographers assume they don't need to use one at night. Any night scene with bright city lights, or other points of bright illumination, can cause lens flare just as easily as a daytime scene. Avoid any unwanted flare and get in the habit of always having the correct type of lens hood for the lens you are using.

Stop the shakes

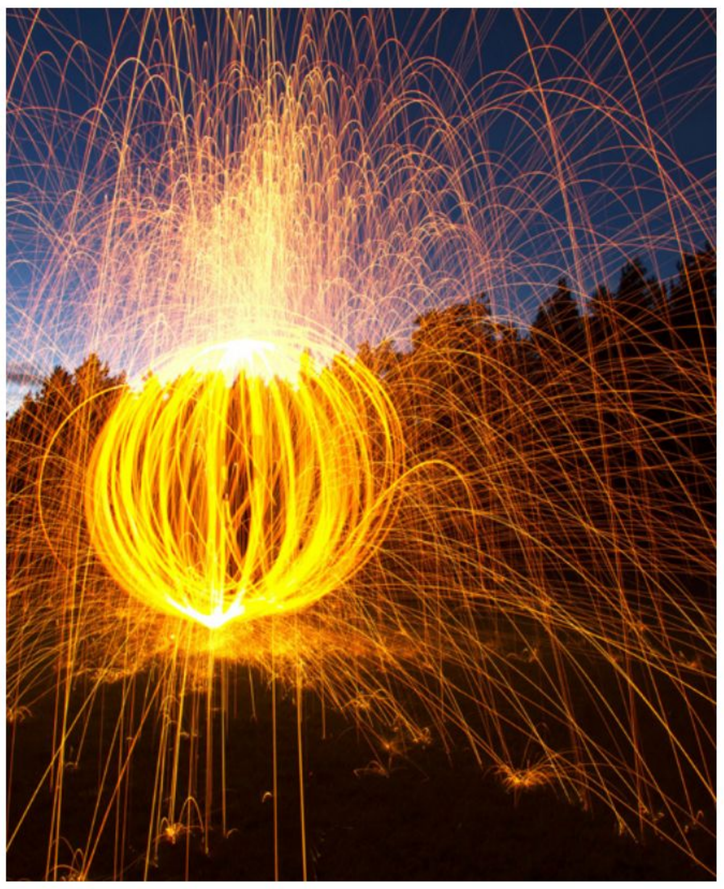
At night, your camera's shutter is going to open for long periods of time. The one thing that can kill a great shot is camera shake. People don't realise that the damage to the shot can be done right at the start, when you press the shutter button and cause a momentary shake in the camera body and tripod resulting in a blurred image. Try using a remote release cable, or setting a 10 second countdown timer on your camera, so you are not touching it when the shutter opens. Also, if your camera has the option, you can flip up the mirror and lock it before the shot is taken as, sometimes, even the 'slap' of the mirror going up can create small shakes.

The right priority

Depending on what kind of shots you are after, it is a good starting point to put your camera in AV mode (aperture priority). This lets you decide what aperture will be used, until you opt to change it; f/8 or f/11 are a good jumping in point. Stopping down to f/16 or f/22 will give you greater depth of field and much longer exposure times. Opening up to f/4 or f/2.8 will have the reverse effect.

Add light

Have you ever thought about light painting in your image? Light painting refers to the technique of illuminating parts of your scene with additional light sources. Light painting has become very popular and ranges from simply using a flashlight to illuminate a dark foreground subject, to using all manner of light sources, such as strobes, sparklers, coloured LED lights and even steel wool set alight - to create huge showers of sparks. This 'light art' is very popular and great fun to try.



Quick guide

Below is a quick list of exposure times for a number of general night-time scenes. These are ballpark figures, but they will help give you a place to start when it comes to setting up your camera and sorting out the settings you need. Our guide assumes an aperture f/11 and an ISO of 200.

City at night	10s
Landscape at dusk	25s
Fairground at night	6s
Fires at night	1-2s
Candles indoors	30s
Full moon landscape	10min
Star trail	8min
Fireworks	2-15s

Static or blurred?

To keep the static objects in your shots sharply focussed, you will, as we've mentioned, need to lock down your camera on a tripod. Longer exposure times will render any moving objects blurred. Traffic trails are classic example of this. If you want moving objects to also appear static, then you are going to need to open up your aperture and increase your camera's ISO settings so your shutter speeds are capable of freezing the motion of your subject.

HOME PHOTO PROJECTS

Some fun indoor projects to really get your skills focused

If you're a keen photographer and always in a rush to get outdoors and go and shoot some distant landscape, then bad weather will sometimes rear it's ugly head and dampen your enthusiasm. Rather than packing your gear away, why not consider doing some indoor photography? Just because you are confined to your kitchen table, does not mean you are not being creative. In fact, it can be argued that setting up an indoor shoot can be even more creative than you might imagine. The smaller scale of an indoor shoot, for instance, means you can actually replicate larger professional studio setups right there on your own dining room table.

Your camera and lens, some card and a couple of lights are all you need to begin to explore some fascinating aspects of photography that the great outdoors can't offer. Where else could you photograph the swirling patterns found in smoke, or capture the most fleeting of moments as a drop of water splashes down into a dish of coloured liquid? This section contains some projects that explore just how creative you can be without the need for a professional studio or some very expensive studio equipment. It will even show you how you can turn your dining room into a temporary home studio when you want to go a little larger scale. ■

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"This section contains some projects that explore just how creative you can be without the need for a professional studio."

Cross-polarisation photography

Where cheap plastic becomes fantastic!

The circular polariser is one of those filters that we should always have in our camera bag. Along with neutral density filters they are always useful when out on a landscape shoot. Circular polarisers are used primarily to darken blue skies and make clouds whiter. They are also excellent at managing glare and reducing reflections from shiny surfaces like water and glass, as well as eliminating haze. A useful filter to have then? No doubt, but polarised light also has quality to it that can turn basic, cheap plastic items into psychedelic art pieces. A circular polariser is the key to this effect.

Cross-polarisation photography actually stems from a scientific process that is employed to find weakness in glass and plastic. For our purposes, we can use this technique to place plastic objects under polarised light and record the outcome on our camera. It is fair to say the outcome is definitely something to behold. This kind of photography was all the rage 20-30 years ago and it still has its followers today. If nothing else, it makes for some spectacular abstract images too. To do this, you will need a few items to get the results you need.

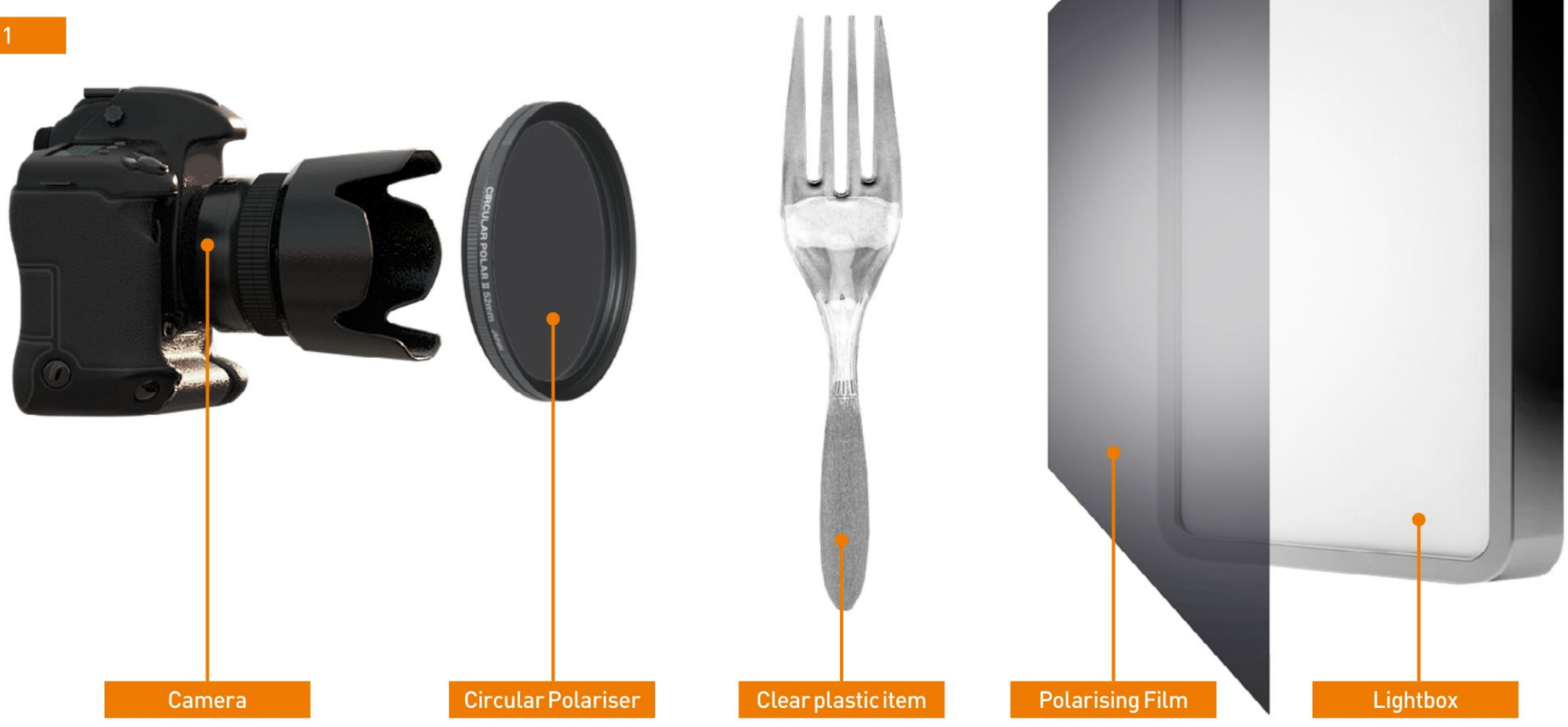
What do you need?

First of all, you will need clear plastic items. The cheaper and nastier the better. We found some plastic spoons, plastic glasses, a child's geometry set, all made from cheap industrial plastic. Dig out your circular polariser from your kit bag and attach it to your favourite lens. If you are buying one, you can pick one up on Amazon starting at as little as £10. Our setup uses a Canon 5DMK2, an EF 24-105mm f/4 lens and a Cokin circular polariser. Because we are likely to be working with slower shutter speeds, a tripod will be essential to avoid camera shake. Although you have a polariser on your lens, you will also need to be able to emit light from a polarised light source. This may sound complicated, but there are two ways you can do this. The first method would require to purchase a sheet of polarised film which you would place on a light source of white light such as a lightbox. You would place your plastic objects on top of that and then photograph the plastic objects with your camera with the circular polariser attached. Diagram 1 below, shows this particular setup. This is a great way to do it, although it does have a couple of drawbacks. Firstly, you may not have access to a lightbox, but you could always fashion one out of a cardboard box, a sheet of thin white paper and a desk lamp placed behind it. Secondly, the sheet of polarising film is not going to be that cheap as it is a specialist material. For a an A3 sheet, you could expect to pay around £90.

The cheapest plastic materials, such as these cups, cutlery and even a basic geometry set are the key to producing some amazing cross-polarised results.

Below is a diagram showing the basic cross-polarisation setup that uses polarising film and a source of white light, in this case, a lightbox.

Diagram 1



An alternative

Happily, there is an alternative that does not require you to get your hands on a sheet of polarising film and a lightbox. You may not know it, but there are probably a few bits of tech in your house that emit polarised light. Various televisions, computer monitors, mobile phones and tablets have a sheet of polarising material built into their display. Be aware that not every device will have it. As an example, we have a TV in the kitchen that does not have this feature, but the TV in the lounge works perfectly, as does our mobile phone, iPad, and computer monitors. This is a useful tip to remember as it means we have what we need for our shoot. So, here is our modified setup, using a TV to replace the lightbox and polarising sheet shown in diagram 2. The only thing you need to be able to do, is have a white image on the screen. On a computer, you can simply set your operating system's wallpaper background to white and use that. On a modern TV, you can display photos, so all you need is a jpeg of nothing but white and you can display that.

Diagram 2

Setting up

The setup can be as simple as you like. We've just placed a sheet of white Perspex by the TV screen and set the camera on its tripod in front of the that with the circular polariser on the lens. If you can, avoid placing objects right next to the screen as you may find you record the pixels of the TV screen and run the risk of creating a moiré pattern. Keep a little distance between the subject and the screen. Place your object and get it framed how you wish, then set your focus to manual and make sure the object is in focus. Try to black out the room if you can, or at least draw curtains to reduce the amount of ambient light.

Fade to black

Turn on your TV/monitor and make sure it is displaying a white screen. If you look through the viewfinder, you should see a rainbow pattern of colours on your plastic object. Now, while still looking through the viewfinder, slowly turn your circular polariser. You should see the white screen fade between white and black depending on how much you rotate the circular polariser **[1-4]**. Now you can choose a high-key look (white) or a more low key appearance (black). You may also see that as you rotate your filter and it fades to black, the colours appear more vibrant.

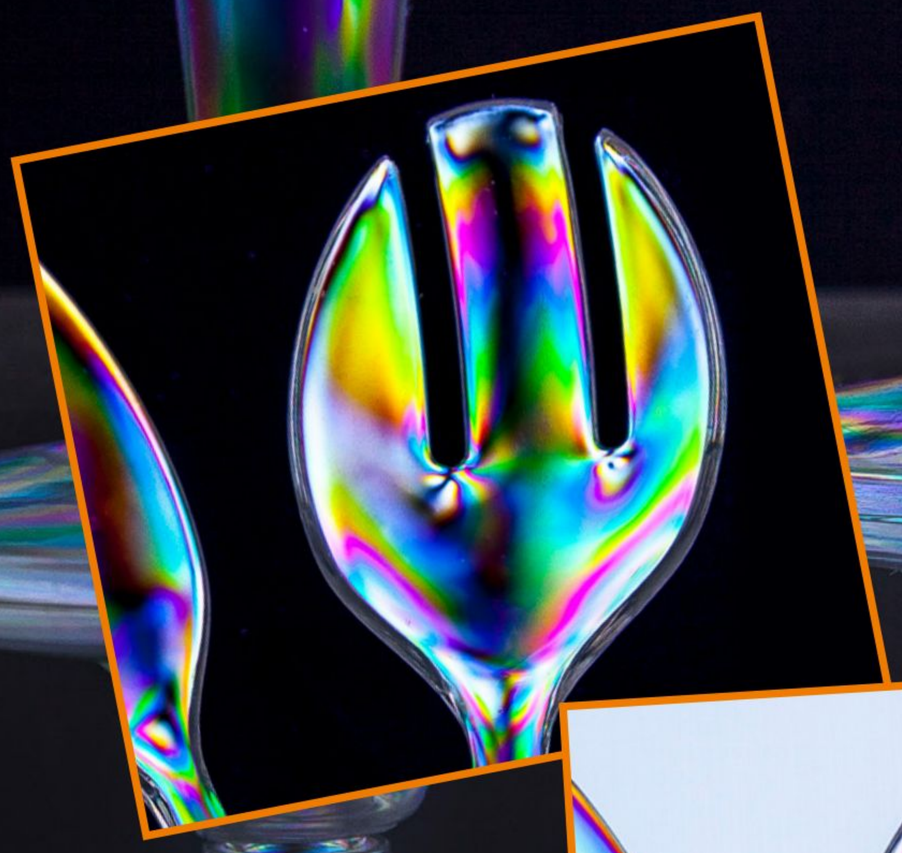
Exposure time

When you have the image as you want it, you'll need to dial in your camera settings. We shot on manual and arrived at a shutter speed of 0.6 sec, an aperture of f/10 and ISO 50. Be aware that if you shoot in auto on a predominantly white screen, your camera will probably try to underexpose the image, so you may need to add +1 to +2 stops of exposure compensation.

On a black screen, your camera will most likely attempt to overexpose by a similar amount. In this case you will need negative exposure compensation of about -1 to -2 stops. This is because your camera's meter will average the scene's brightness and try to expose it as near to middle grey as it can. Therefore predominantly bright/white images become underexposed as the camera tries to pull the exposure more towards mid-grey.

Similarly, dark/black images will be pushed more towards an exposure that matches mid-grey, resulting in overexposure. Keep an eye out for this, and compensate where necessary.

As you rotate your circular polariser, the white television screen will transition to complete black. The rainbow patterns revealed in the plastic will look even more pronounced.



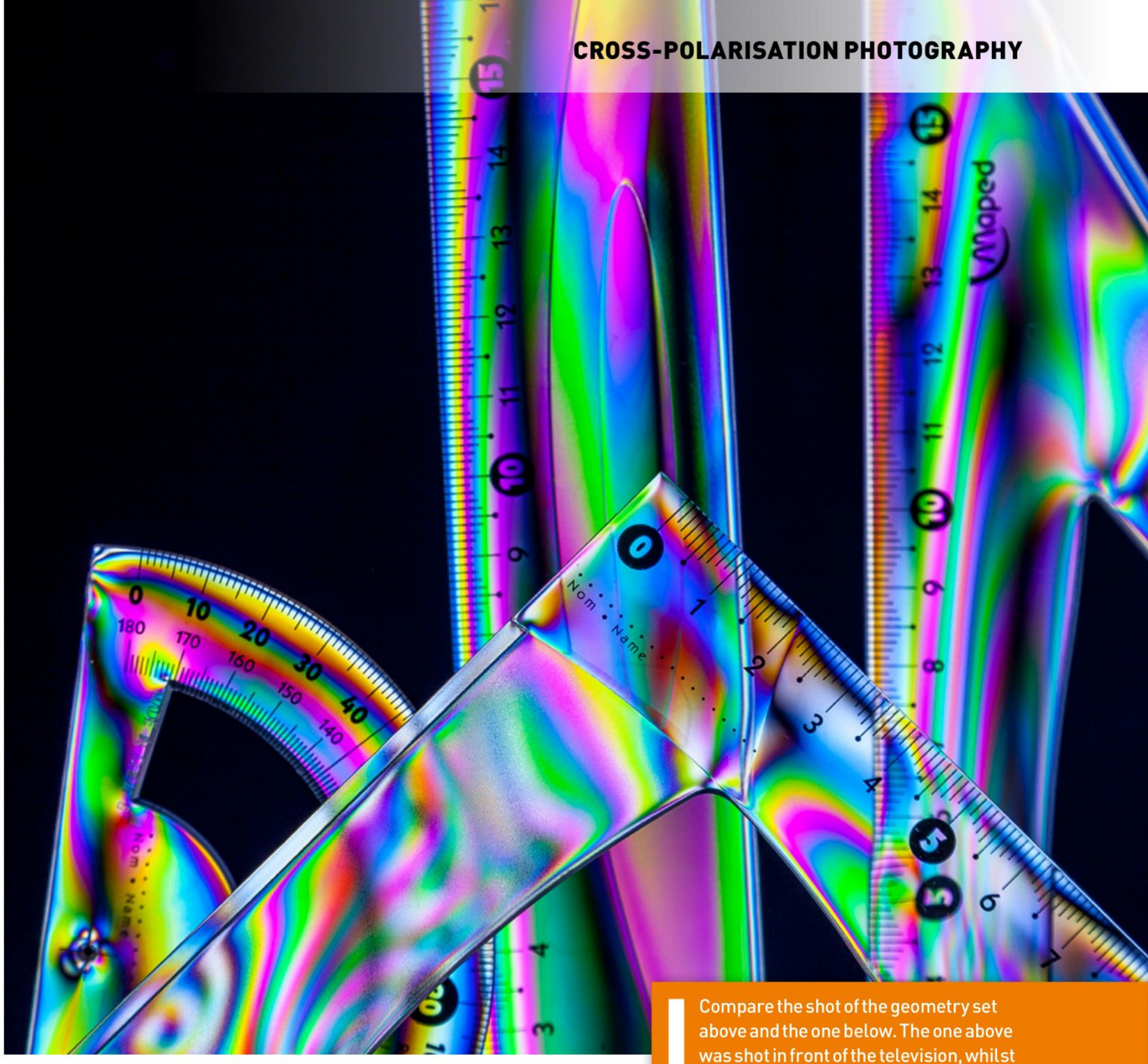
Now it's time to experiment with all the plastics you can lay your hands on. Remember, you can exaggerate some of the colour patterns in the plastic by bending or squeezing the material. You can also switch between shooting low-key images against black, or turn your polariser until the screen turns white for high-key shots.

Trip the plastic fantastic

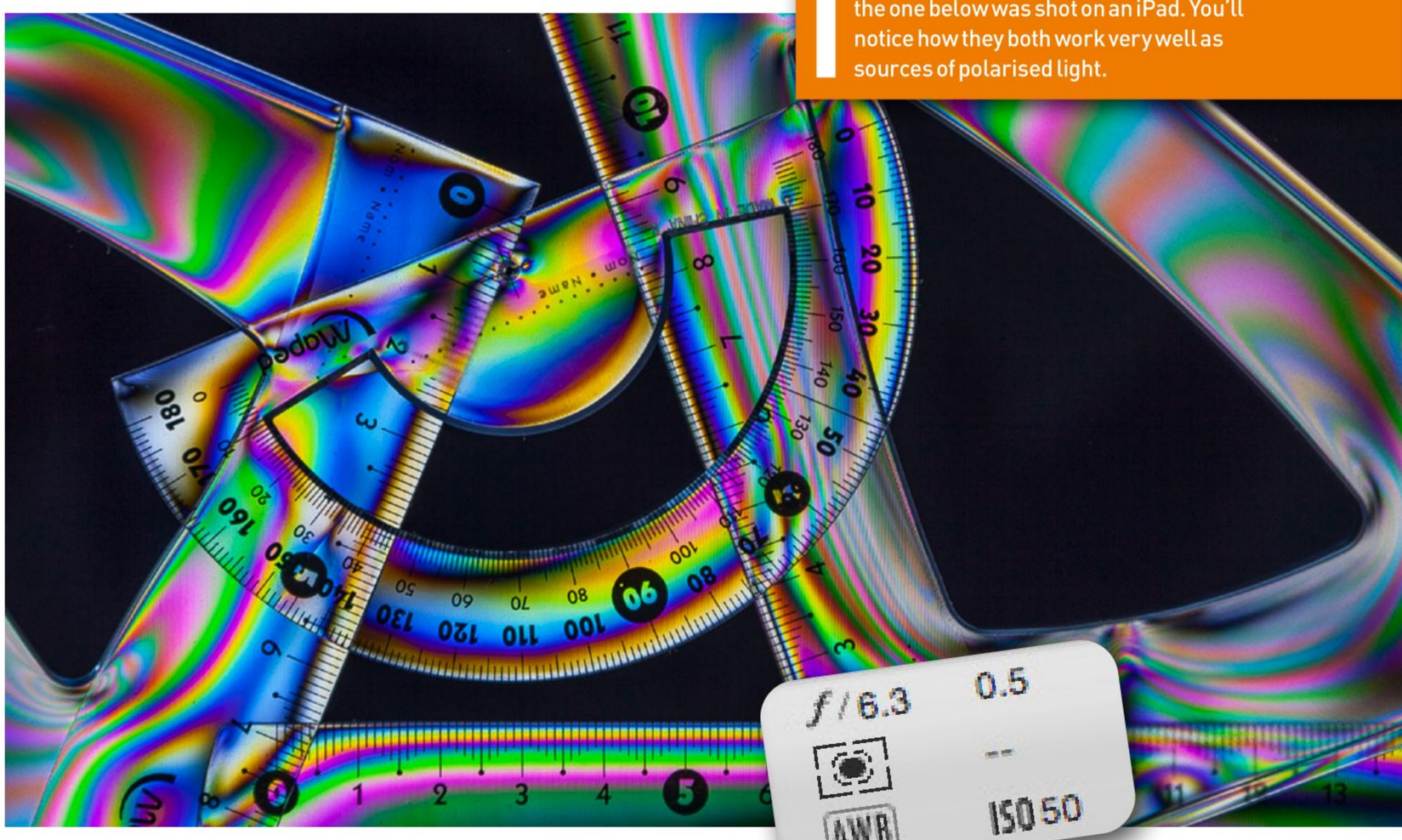
All you need to do now is shoot away to your heart's content. Try different compositions and go as abstract as you like. You could even try stressing some of the plastic items by bending or squeezing them. This extra stressing should produce even more rainbow colour patterns dailling your psychedelic look all the way up to 11. As a little experiment, if you place a piece of good quality glass in the shot, you should see very little in the way of coloured stress patterns. This is why cheap plastic is the best choice for these shots.

One last setup

Whilst we had all the materials out. We did have a quick test to see what else worked as our polarised backlight. We had an old iPad and put some geometry equipment up on it and shot it from a above. We set the screen to white as with the TV and got the camera's settings dialled in. We ended up using a shutter speed of 0.5 sec, an aperture of f/6.3 and ISO 50. The tablet worked great. We would have used a mobile phone too, but the screen was a little small for our plastic items.



Compare the shot of the geometry set above and the one below. The one above was shot in front of the television, whilst the one below was shot on an iPad. You'll notice how they both work very well as sources of polarised light.



At a push though, you could use it for a macro cross-polarised session.

Processing tweaks

Once the images were downloaded and the best ones picked out, all that was needed was to deepen the blacks and brighten the highlights. This produced some wonderful and vivid images. A small amount of cleaning up of the plastic in places to remove scratches, dirt, and dog hairs, and our images were ready to dazzle the world. ■

Explore the macro world

Who needs outer space when you can photograph 'near space'?

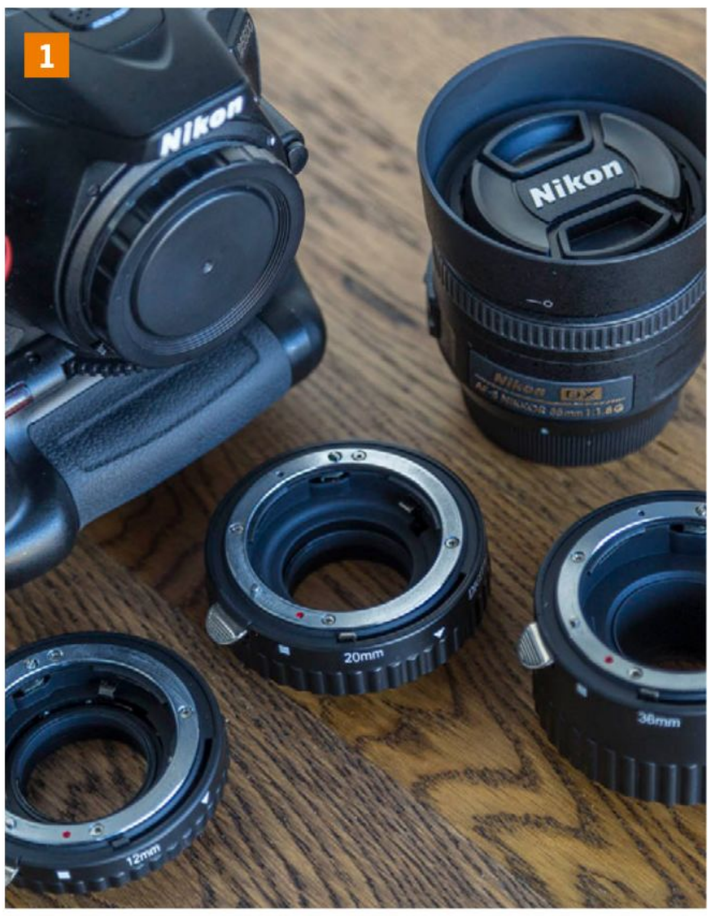
> "A lot of macro work can be seen on picture sharing sites like Flickr. The insect world is a popular subject for macro photography, as is plant life."

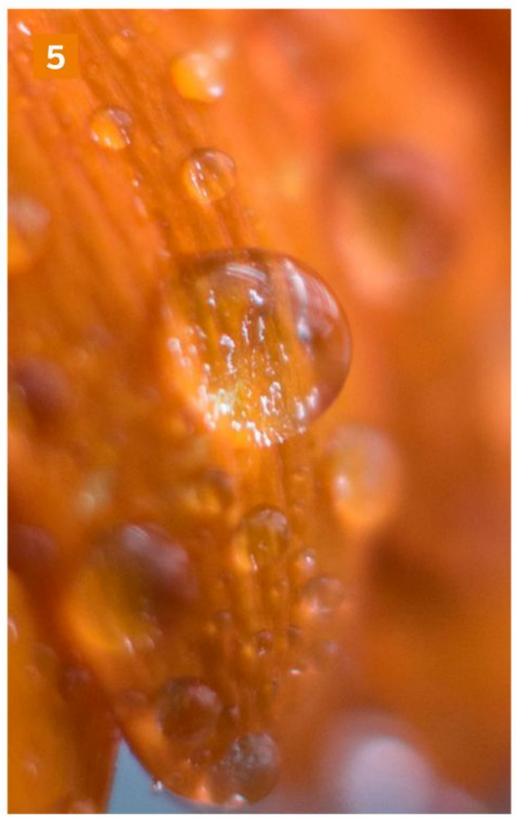
It comes down to personal preference of course, but we would always recommend beginning your macro photography experience indoors. This type of photography does not require a lot of space. As long as you have your camera, lens, tripod, a tabletop and a light source, you are ready to begin. You're in comfortable surroundings and you aren't subject to the vagaries of the weather. You can concentrate on learning the craft and a cup of coffee isn't far away either!

To be honest, anything and everything is fair game for macro photography. A lot of macro work can be seen on picture sharing sites like Flickr. The insect world is a popular subject for macro photography, as is plant life. Browsing through our images may give you inspiration. We did once read somewhere about a piece of advice given to budding macro photographers: "If you're struggling to find a subject, go look in the fridge". The chances are there will be some fruit or vegetable in there that will happily pose for your shots; something colourful with interesting textures or maybe something more minimalist and abstract. It's up to you.

> “Looking through the viewfinder, it is now a case of finding the point of focus, the point of greatest interest.”

All the images in this macro guide were shot on a Nikon D5500 with an AF-S 35mm f/1.8 lens using a 12mm macro extension tube.





Setting up

In the case of our example, we set up the camera with a AF-S 35mm f/1.8 lens and 12mm macro extension tube **[1]** on a tripod next to the dining table. We had white card which was placed behind it and set up two flashes controlled by a wireless trigger **[2]**, one directed at the subject and set manually to 1/128 power **[3]**, the other pointed at the card to bounce some light from behind. This one was set at 1/128 power. If you don't have off-camera flashes you could work on your kitchen table with a desk lamp or by a bright window.
The camera was set in manual mode at 1/160th of a second with an aperture of f/1.8 and an ISO setting of 100 **[4]**. The macro lens is set to manual focus. The combination of shutter speed and low power flash meant that we could eliminate any possible camera shake or movement in the subject. A shutter-release cable is also a wise addition as it means you don't have to touch the camera and risk it moving. At these magnifications, the slightest movement will be noticeable.

For these particular shots we wanted to have very shallow depth of field. We wanted to pick out a very small area of focus and just concentrate on that. You could go the other way, of course, and set your aperture at f/16 or greater to resolve a larger area of focus. After a bit of fiddling around with the light positions, subject-to-lens distance and composition of the flower, we could make a start on the macro project.

Focus

Just to reiterate: make sure your lens is set to manual focus. If left in auto-focus mode it may struggle to lock on to your subject or may actually decide to focus on to another area. Looking through the viewfinder, it is now a case of finding the point of focus, the point of greatest interest. Since we are dealing with very shallow depth of field, it is quite important to spend some time getting this right. To help us, we used a very bright torch to illuminate the subject so it can be seen very clearly and manually fine-tune the focus. It is always good practice to check your focus after every shot because something might have moved, albeit a tiny amount. At this kind of magnification and at such a shallow depth of field, that could ruin the shot.

Since you're at home, you can download the shots you've done so far and review them. We did the same with the first set of shots taken. They were OK, but not great. Something was missing, some little detail to lift the shots. Staring out the window, we noticed it was raining. Rain! There was a lightbulb moment and we raided the cupboard under the sink for an ancient, empty bottle of detergent with a spray nozzle. We cleaned it out and filled it with fresh water, set up another flower and sprayed it liberally with water. As we sprayed, the liquid started to 'bead up' forming globules that clung to the petals and leaves of the flowers **[5]**. Some dripped to the edges of the petals and hung there. This is where it really took off. Suddenly the flowers were looking much more visually appealing. So we sprayed and clicked away quite happily. At the end of the shoot, we had a great collection of macro shots and a very wet dining room floor! ■

> “ The results are surreal and there is an infinite amount of variation each time you do it.”

Liquid flow photography

Create amazing ink and paint sculptures and abstract images

This project is a great indoor photographic project. If the weather outside is not playing ball and you fancy trying something a little different, then liquid flow is the way to go. In essence, liquid flow is the capture of the movement of paints, dyes and other viscous liquids dropped, or injected, into a small body of water. The results are surreal and there is an infinite amount of variation each time you do it. Every liquid flow shot is unique. At its simplest, you can shoot with a compact camera, a strong single light source and a glass of water if you wish. For this tutorial, we’re going to show you a standard setup for capturing these intricate liquid formations using a camera, flash, a small fish tank, small glass vase and a wineglass.

The materials

First you'll need a glass container of some description to hold tap water. Everything from a wine glass to a fish tank is fair game. It just needs to be clean, clear glass, so you can see the action going on inside. Next, you'll need some coloured inks or dyes to drop into the water. Standard water based inks are great and easy to source. The downside is that when dropped into water, the colours can be quite translucent and disperse very quickly. That's no problem if that's what you're after but for more interesting liquid structures, something like acrylic inks and paints are much more dense and hold their shape for longer in the water. Alternatively, you could even try adding food colouring to single cream. When mixing either the acrylics or the cream, you need it to be fairly viscous but not so dense that when it hits the water, it just clumps together. You may have to experiment to get the right balance. What you are after is a density of liquid that allows it to disperse into a tight cloud without thinning out too much early on. If you're working in a fish tank, you might want to do some test runs in a glass of water first. The delivery method is down to personal preference. You can just put your liquids into the water tank or you can use a pipette for more droplet control. The other option is to use a syringe in order to direct jets of coloured liquid into the water. Like all the options, it is best to experiment before moving to full-scale.

There are plenty of coloured liquids to choose from. Inks, paints and dyes are perfect. If you want your liquids to be as dense as possible though, consider acrylics and even household single cream with a few drops of food colouring in it.

Syringes are perfect for accurately delivering small amounts of paint into your tank but pipettes will do just as well. Most coloured ink bottles come with droppers built in anyway.

A small cheap aquarium was the first container we used for the initial shots. Then we started to down size to a small square vase and then a wine glass.

Camera and lens

The beauty if this kind of photography, is that at its simplest, it doesn't require anything too special. You could set up a wineglass, light it with an LED torch, then drop some ink into it and capture it on a small compact camera. If you are using a continuous light source such as a lamp or torch, you may be working with shutter speeds slow enough for your moving liquids to show up as motion blurred images. You would need a tripod to eliminate any chance of camera shake with a large aperture and high ISO sensitivity to keep the shutter speeds high enough to freeze the action. We are going to use a Canon 5DMK3 and a trusty 24-105mm medium zoom lens on a tripod.

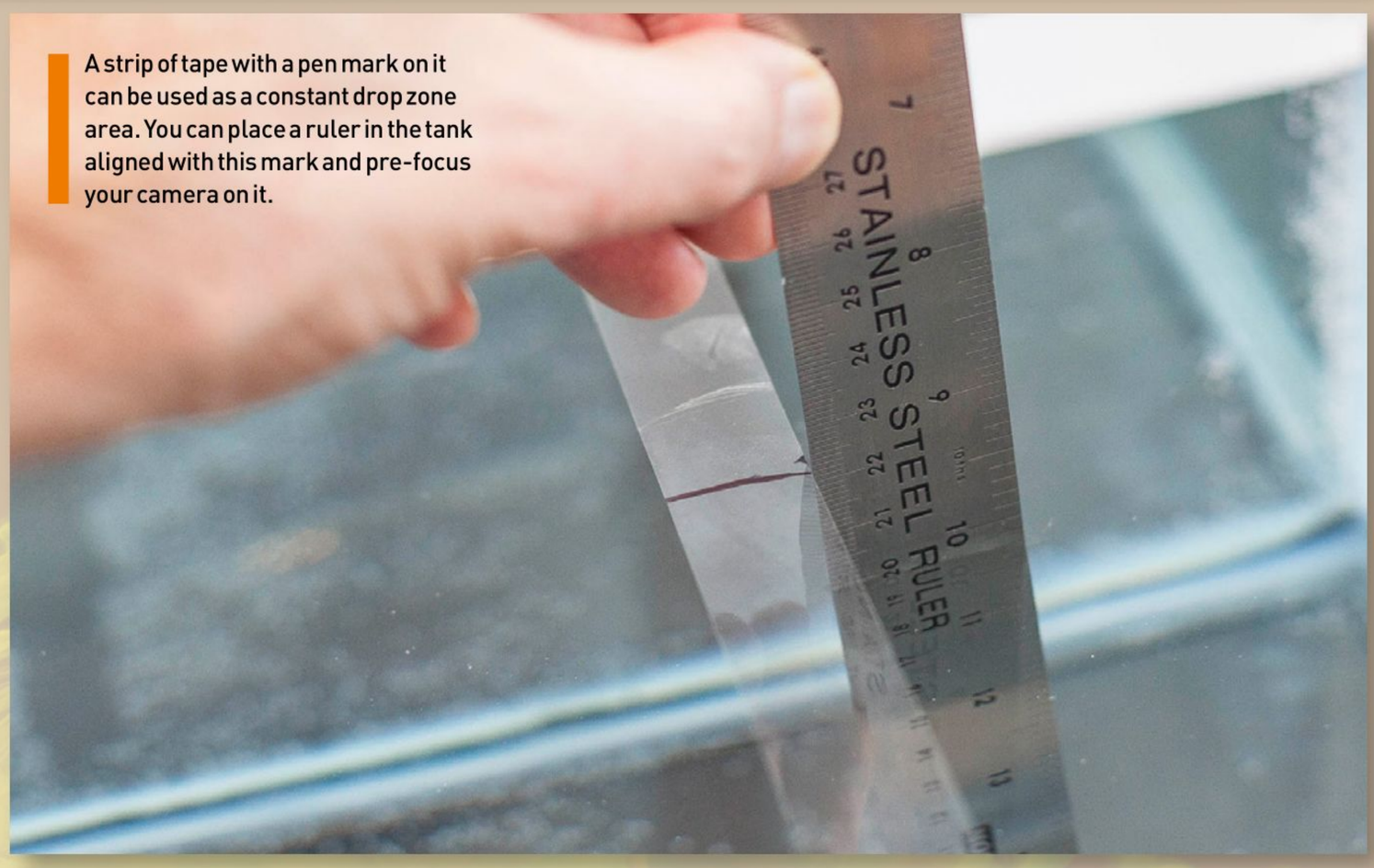
Light sources

As mentioned before, you can use a bright LED torch or two to illuminate your setup. Here, a pair of flashes controlled remotely by a wireless trigger is being used. This way you can keep things loose and move the lights about as you see fit. The flashes won't have to be used at very high power settings since they are right next to the tank of water. This is a very helpful situation since at low power, the flash duration is very short. In a completely dark room, this brief pulse is the only light that will be recorded in the shot, so the flashes effectively freeze anything they light up. More on this later.

The basic setup is shown here, with the white backdrop in place and one flash positioned to bounce light off it.

Setting it up

Our fish tank was set up in the dining room on a large black sheet of card which could be curved up to create a black backdrop for the tank. We also had a sheet of white paper which we could place on top to turn the backdrop white if needed. The tank was filled with water and allowed to settle. If you find that bubbles form on the glass, you'll need to brush these off or they will be visible in the shot and very distracting. Next you'll need to place a piece of sticky tape across the centre of the tank. Mark a line in the centre of the tape so you always have a consistent drop zone for your coloured liquids. The flashes were set up either side of the tank on tiny cheap tripods. The camera and lens were set up on the tripod in front of the tank glass and the wireless trigger was attached to the hot shoe. Our coloured liquids consisted of acrylic paints which had been thinned down with a little water and each colour was in its own syringe to avoid contaminating each colour.



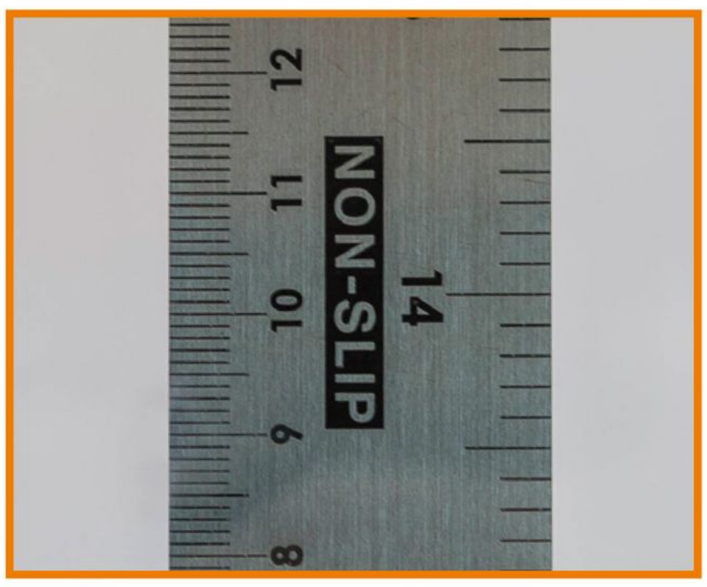
A strip of tape with a pen mark on it can be used as a constant drop zone area. You can place a ruler in the tank aligned with this mark and pre-focus your camera on it.

The EF 100mm f.2.8 macro and the EF 24-105mm f4 L Series were the two lenses used to capture the images you see here. The 24-105mm is a great all-rounder with a close enough focusing distance to make the tank shots possible. The EF 100mm macro lens is perfect for getting in even closer, particularly if scaling down the size of tank you're working with.

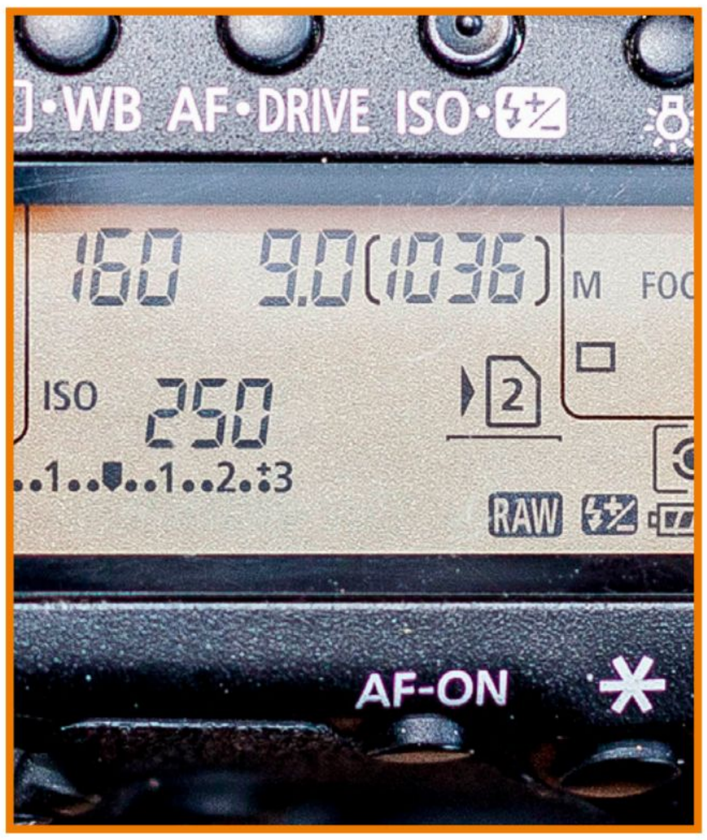
The Canon 5DMK3 was our camera of choice for the shoot. Although a few years old now, it still is a firm favourite with pros and enthusiasts alike.

Camera settings

Now it is a case of getting the settings for the camera and the lights correct. Set the flashes at 1/32 power. At this level, the flash duration would be about 1/8000s which is more than enough to freeze the action. Then set the camera to manual focus so it doesn't alter during the shoot. Place a ruler in the tank of water in line with the drop zone mark on the sticky tape and pre-focus the camera on that. We used the white backdrop first, with one flash pointed at the backdrop and the other pointing at the drop zone area in the tank itself. Curtains were drawn in the dining room to lower the ambient light level. After a little trial and error with a static object placed in the water as a temporary target (a banana in this case as it's all we had), we arrived at settings of aperture f/9,



ISO 250 and the shutter speed was up near the flash sync speed at 1/160s. If a shot was taken with the flashes turned off, it would capture a shot that was totally black. This was perfect. Only the 1/8000s pulse from the flashes would be recorded whilst the shutter was open for that 1/160s duration. Take some test shots and look out for unwanted reflections or any stray bubbles in the tank.



Camera drive settings

This is purely optional but remember that each time you inject more and more liquid into your tank, the water will eventually be useless to you and you will need to flush it out and start again with fresh clean water. To give us the best chance of capturing plenty of liquid flow as it unfolded, the camera's drive setting was changed to Low Speed Continuous. What this means is that when you fully press the shutter release button, the camera will keep taking shots until you release the button. On the 5DMK3, this meant we could capture about three frames per second and since the flashes were only working at 1/32 power, they could be relied upon to keep emitting pulses for each frame that was shot.

First attempts

We used the red syringe first. It was placed in the water at the drop zone and gently injected into the water directly downwards. At the same moment, the shutter button was pressed and we captured a continuous sequence of about twelve shots that showed the red cloud expanding outwards from the injection point. A quick review of the shots on the camera monitor screen showed it had worked well. Now we could have some fun.

Low Speed Continuous mode was used to shoot a sequence, rather than relying on capturing a single shot.

Go with the flow

What followed next was a series of shots with different colours being used in the tank until the tank required flushing and setting up again. On the second run, we removed the white backdrop so it would be totally black and proceeded to take more shots. We tried injecting two colours at once for more variety and built up a nice collection of images.

Two syringes are injected into the water at the same time to create this fun dinosaur B movie effect.

What was becoming clear though, was that the tank was a pain to reset every time the water became too cloudy. Next, we opted to use a smaller square glass vase. We replaced the 24-105mm lens with a 100mm macro so we could get in nice and close to the action. We also decided to add some props to the water for some visual interest. We tried a bottle of nail varnish, a watch and a rubber dinosaur. The liquids were injected downwards and it was eerie to see how it slowly enveloped the props in shrouds of colour. The dinosaur was particularly funny, since it looked for all the world like a scene from a bad B movie horror film.

Last shots and processing

After these images, we downsized even more until we were shooting a wine glass. After the session was done, we loaded the shots onto the computer for a closer look. Inevitably, there were the odd groups of bubbles and particles suspended in the water but with some careful processing to boost the blacks, contrast and saturation, we could crop the images into a great little collection of liquid art and surreal images.

The liquid flow photography is a great indoor tabletop project to get your teeth into. No image is ever the same and you can have some fun into the bargain. ■

Scanner photography

Take a break from your DSLR and try something a little different

When you think of capturing a photograph you would be forgiven for immediately thinking of a digital camera as the device of choice. For the most part that is true but there are alternative devices to cameras for capturing still life images. There is a whole genre of still life photography that uses a flatbed scanner as the capture device. It is often referred to as scanner photography, scanart or scanography. It can be quite a creative diversion from normal digital photography in that you have a completely different approach to how you compose and digitise the subject matter. If it's raining outside and you have a scanner sitting idle in the corner of the office and a creative itch you need to scratch, this could be for you.

> **"There is a whole genre of still life photography that uses a flatbed scanner as the capture device."**

A number of high quality scans have been arranged into these beautiful collages by this creative scanographer.

Dedicated photo scanners like the Epson Perfection V600 are the best choice if you are serious about creating scanned art.

The HP PhotoSmart C6380 All-In-One was used to create most of the images you see here. Not the best scanner in the world if we're honest but it was fun.

The scanner

A flatbed scanner is a device with a glass surface upon which objects and documents can be placed. Then a movable xenon, LED or fluorescent light source in the form of a thin strip travels across the glass beneath and the reflected image is captured on a sensor via a series of mirrors. Most modern scanners either use a charged-coupled device (CCD) or a contact image sensor (CIS) to record the image. Scanners come in many sizes and shapes, but their basic function remains the same. Modern scanners, even cheap ones can now scan at resolutions up to 4800dpi and in 24 bit - 48 bit colour.

All in one

A lot of people these days are likely to have a printer and more often than not they might have a printer/scanner combined in an All-In-One device. We have such a machine in our office which we commandeered for a while. To be honest, it's not the greatest scanner in the world as objects need to be flat against the glass of the scanner bed but it could still yield dome interesting results. The better choice for good quality scans is a dedicated photo scanner which can focus on objects as far as 10-15mm off the surface of the glass bed. Still, we had our scanner and we were going to have a little fun with it.

Subject matter

The subject you choose to scan is down to personal preference. This is part of the beauty of scanography as you can put pretty much anything on the scanner and record it. Leaves, sea shells, cat's paws, flowers, slices of fruit, watches and driftwood fragments are all great candidates for scanning. If you check out websites like Pintrest and Flickr, you will see that even various human body parts have been scanned. What goes

The scanner gets a good clean and a blast of compressed air before scanning starts.

on between you and your scanner is entirely up to you!

Setting up

Another aspect of this kind of photography is that there is minimal set up time involved. Our scanner was on and connected to the computer. All it needed was a good clean with a microfibre cloth and a good blast with a little compressed air to shift as much dust as possible. We had a selection of items we were going to try such as some daisies, autumn leaves, ferns and even some sweets and popcorn.

Scanning the subjects

The daisies were up first. They were arranged in a small group on the glass of the scanner and a pre-scan was done so we could see what it was looking like. Normally you would have the lid down when scanning a photo or document, but in this case we just left the lid open which resulted in the daisies

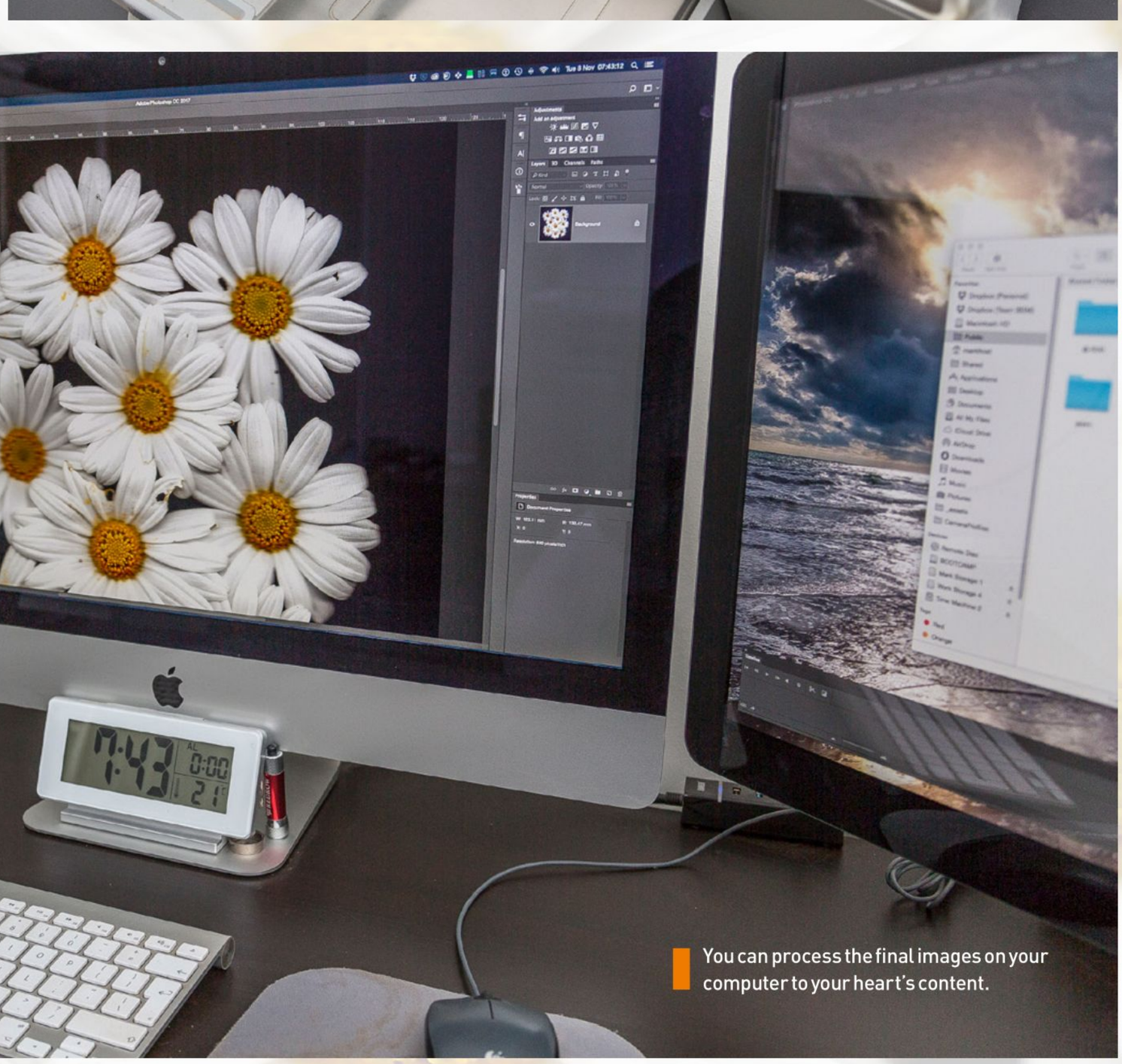
Some of the subjects we were using, waiting their turn on the scanner.

The leaves and ferns gave us some of the clearest scans because we could press them close to the glass and keep them in focus.

being scanned with a dark grey background. We then were able to use the scanner software to select just the area we wanted and scanned it at high resolution and saved it on the computer. We could open it straight away in photoshop to see how it looked and after a little levels adjustments for brightness and contrast, we could turn that grey background to solid black which looked a lot better. You can experiment by putting black non-reflective cloth over you scanner subjects to ensure you can get as dark a background as possible. Conversely, you could use white instead and try to get your subject isolated on a white background.

Scanner issues

Because our scanner was a cheap one, it was only able to resolve detail that was in direct contact with the glass. Anything raised slightly off the glass, was out of focus. With that in mind, we tried our leaves and ferns. With these on the glass, we could actually close the lid and press them firmly against the glass to get as much of the scan in focus as possible. These proved to be some of the best from the session with a lot of detail being captured in the final scans.



You can process the final images on your computer to your heart's content.

Because our scanner was a fairly basic model, the best scans we got were from reasonably flat items, so more of the subject was in focus on the surface of the scanner bed. The ferns and leaves came out particularly well as a result.

Anything you can lay your hands on can be put on the scanner bed. From sweets in their bright wrappers (left) to the petals of delicate flowers (below).

Moving your subject as the scan head passes beneath it can yield some bizarre results.

Get a move on

Another interesting aspect of this kind of photography is the moving scanner head on your device. You would normally not want any object on the glass to move but you can get some surreal results if you start to move your subjects whilst the scan head is in motion. If you place your hand on the scanner and begin to scan, then start to draw your hand up the glass in the same direction as the scan head, you can elongate your fingers. If you also wobble your hands from side to side, they become crinkled like they are reflected in water. Spinning you hand on the spot can really distort the image and create some bizzare looking scans.

More ideas

Some artists have scanned a number of plants and then arranged them in Photoshop to create large, beautiful collages. People have placed a number of personal possessions on the glass, then placed their head in amongst them to create a form of portrait photo. It really is up to you and your imagination now. ■

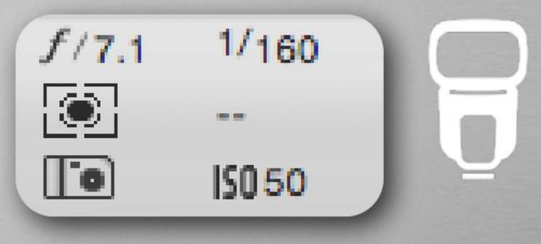
Defying gravity

High speed liquid effects

Here is another great little project to do indoors, or at least in your garage. It is a great trick shot that can make liquids appear to be defying gravity by pouring themselves out of a glass, rather than into it. This is quite a popular and relatively simple shot to achieve. In fact, the end results would make you believe it was a complicated studio shoot but it can be done on a tabletop. The only caveat is that there will be splashing liquids involved. So if you want to avoid any arguments about why the dining room is covered in coloured liquids, you may want to find a spot that is less likely to upset your family or take the time to lay down some cheap plastic sheeting.

No Photoshopping was used to create this effect of the liquid appearing to pour upwards out of the glass. This is an actual physical effect created at the moment of shooting.

"The end results would make you believe it was a complicated studio shoot but it can be done on a tabletop."



The concept

This kind of photography requires the use of a single flash that can freeze the action and capture a key moment as the contents of the glass seem to be making a bid for freedom. There is a little bit of setting up required to get everything prepared for the shoot. First things first though, how can a flash freeze the action? A flash delivers a burst of light from its flash tube, this light is of a fixed brightness and is always the same. In order to alter its apparent brightness, it is actually the duration of the flash that is altered. In this case, the flash we are using is an old Canon 430EX II. If it was fired at full power, the light pulse would last for about 1/350 of a second. If it were set to about 1/4 power, that duration would be greatly reduced to about 1/3000 of a second. This fast pulse of light is what we can use to freeze the action. It does require that the flash is the only lighting in an otherwise dark scene. The camera settings used have to eliminate any ambient light that might be present in the scene. If you were working in your dining room, you could draw curtains or even shoot after dark to make sure there is no stray light.

Below are the approximate flash durations for the 430EX II at each of its power output settings.

Power	Duration
1/1	1/350
1/2	1/1630
1/4	1/3000
1/8	1/4300
1/16	1/5250
1/32	1/5600
1/64	1/6500

A Canon 430EX II. A budget flash but still capable of delivering the power needed for this shooting session.

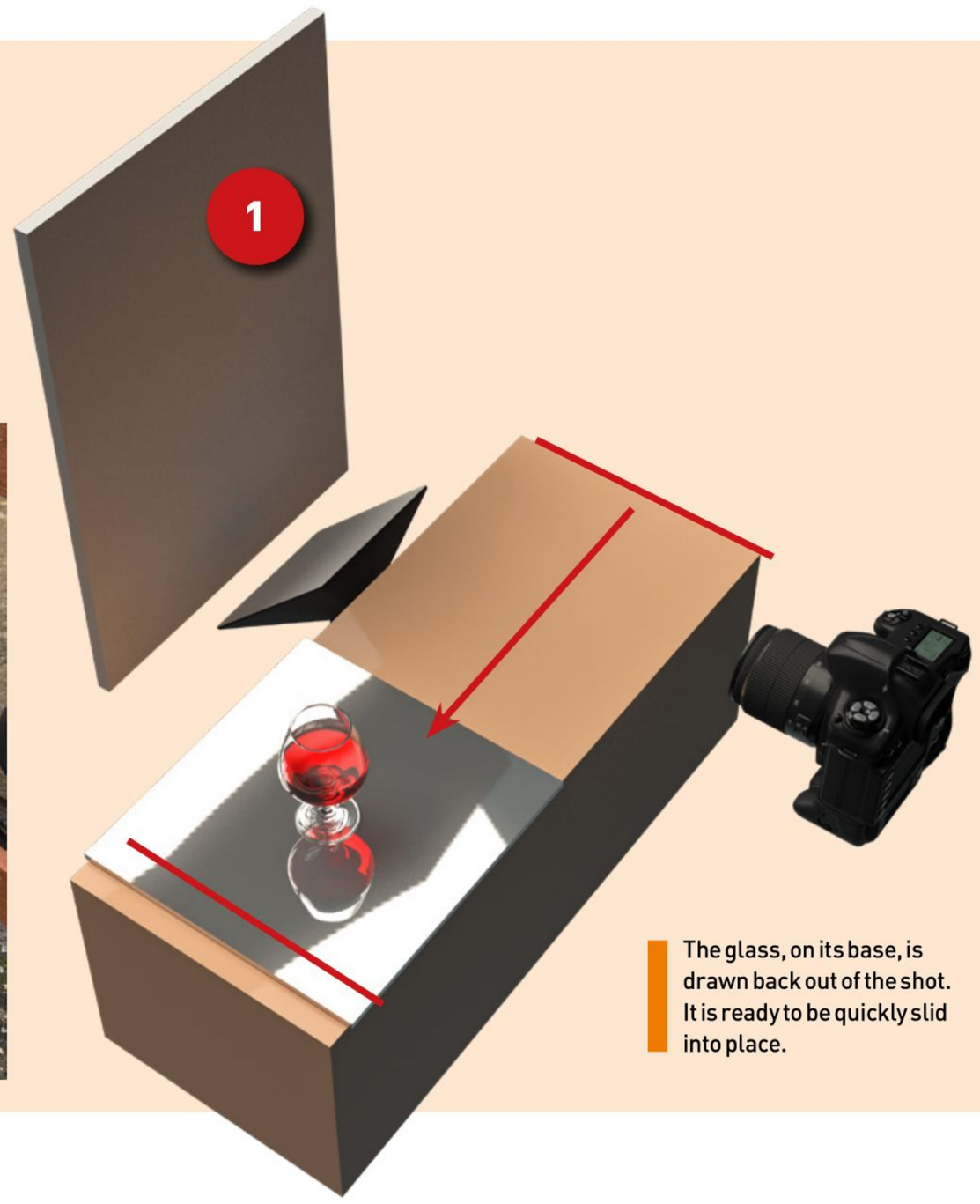
Controlling the liquid

The next thing is to explain how you can make the water leap out of a glass. The idea is to quickly slide the glass of liquid into shot and bring it to a sudden dead halt at a predetermined point. This motion and the very sudden deceleration will result in the liquid splashing to one side of the curved glass and being catapulted up into the air. The point at which this happens is when you take the shot. It requires a glass that can be glued to a surface so it is immobile. Rather than risk an actual glass, we ordered some good quality polycarbonate wine glasses. They are virtually unbreakable and lighter than their glass equivalents. The glass was glued to the middle of a perspex sheet with strong superglue. It can be any appropriate surface, as long as it is rigid and you can bond the plastic wine glass to its surface. We left it overnight to bond and then we were ready for the next part.

Supergluing a plastic wine glass to a perspex sheet may sound a bit daft but the results will hopefully speak for themselves.

Tough and relatively light, these polycarbonate wineglasses are ideal to use in this photographic illusion.

The procedure



The glass, on its base, is drawn back out of the shot. It is ready to be quickly slid into place.

Wine or water?

It's your choice as to what liquid you use but it's a good idea to have something that is bright, but not too opaque. You want light to be able to shine through it. We opted for food colouring mixed in water. This meant we could use different vivd colours and also control the density of colour in the water.

Setting up

We decided to clear a space in the garage to set up the shot. You could use the dining room or any available surface. Just be aware of the splashes you are going to be making soon. We placed the perspex sheet with the glass on top of a couple of old bedside cabinets next to the wall of the garage. This gave us a surface we could slide the perspex sheet back and forth on.

The sheet could be slid to one side and contact the wall and come to a dead halt. The camera was set up on a tripod and the composition framed to capture the glass in this position. We were using a Canon 5DMKIII and EF24-105mm f/4 lens.

The camera was kept at a decent distance to avoid splashing and we used Live View to frame the shot. Bear in mind that you will need to compose the shot in such a way as to leave a blank space above the glass to give you room to capture the liquid as it splashes upwards. A sheet of white card was placed about 500mm behind the glass to use as a backdrop and also bounce the flash off.

Flash settings

We took the flash and a wireless receiver was connected to it. The wireless transmitter was connected to the camera. The flash was set at just under 1/4 power in order to give us a flash duration of about 1/3000 of a second, which would be enough to freeze the action. The flash was then placed behind the wine glass, on the ground, with the flash head tilted up towards the white backdrop. When the flash fires, it illuminates the white sheet, which in turn lights the glass of liquid in front of it. Because the flash is at less than 1/4 power, it means that we can fire it a few times before the charge it's holding is depleted. This gives us two or three chances each time, improving the odds of a successful capture.

Filling up

We had a jug of water and we mixed drops of bright pink and dark blue food colouring together to make a bright lavender colour. We then used a small plastic tube to siphon some liquid into the wine glass until it was about half full. There was a final check to clean surfaces and wipe any unwanted drops off the glass and we were ready.

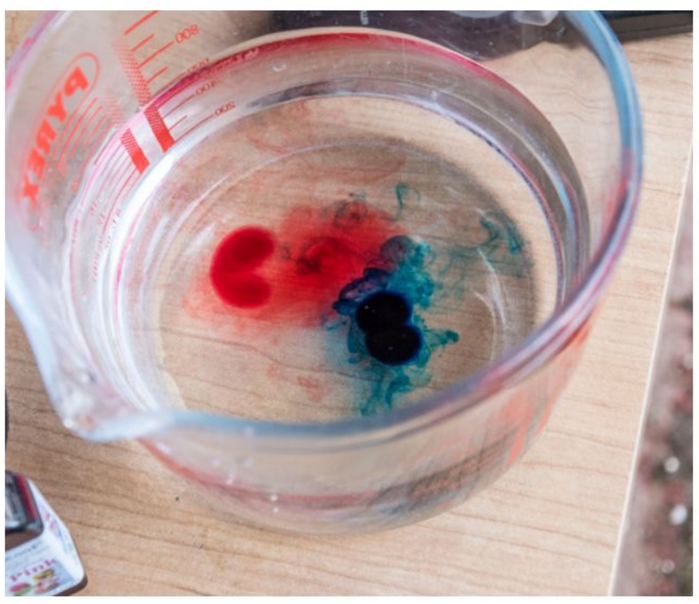
Camera settings

Next, we needed to dial in some settings on the camera. We manually set an aperture of f/7.1, shutter speed of 1/160 and ISO 50. A test shot revealed the shot was virtually black and no

The flash was controlled wirelessly by the TwinLink receiver, which was fired when the shutter button was pressed on the camera.

The base is then very quickly slid into its final resting position and stopped abruptly at a predetermined point.

A second later, as the liquid sloshes out of the glass, you can set off the camera and flash to record the moment.



Using food colouring means you can achieve some very vivd colours which helps with the overall surreal feeling of the shots.

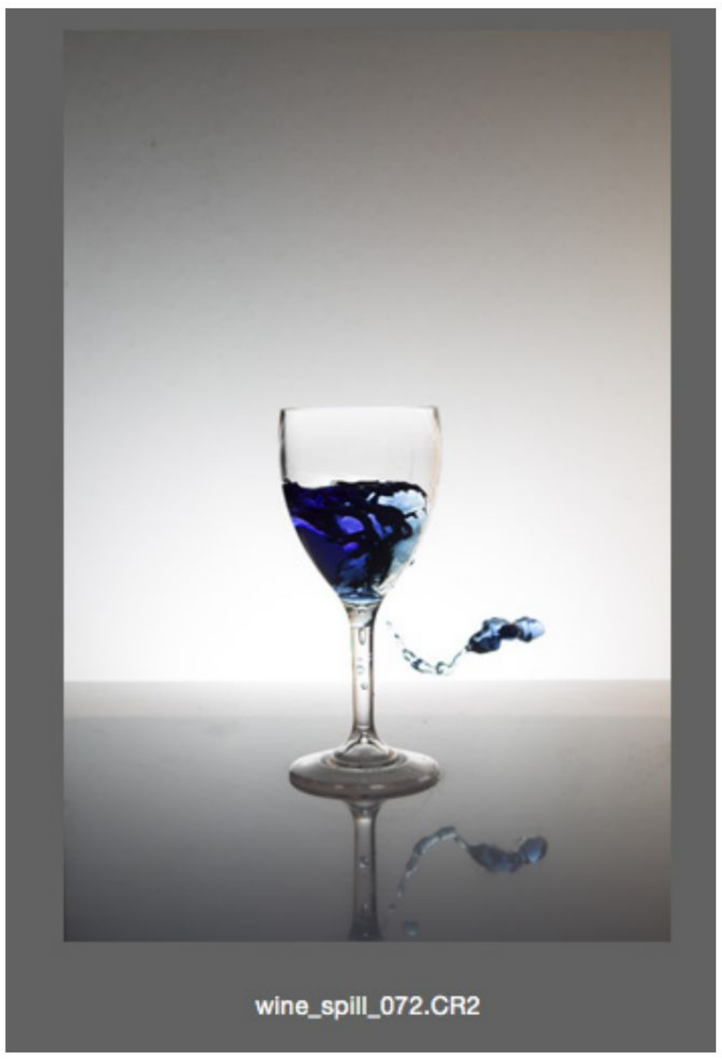
If your camera has Live View, you can prefocus the camera on the subject and keep it in manual focus mode so it doesn't try to refocus.

ambient light in the garage was showing up in the shot. Then the focus was set manually on the front of the glass and the shooting mode was set to High Speed Continuous. This meant we could capture a sequence at six frames per second and give us more chances of capturing the best liquid splash. A cable release was connected to the camera as well, to avoid any unnecessary movement. A few test shots confirmed that the flash power was good and the liquid had the right translucency. So far, so good. Now came the moment of truth.

Cleaning up after each attempt was a bit a of pain but necessary.

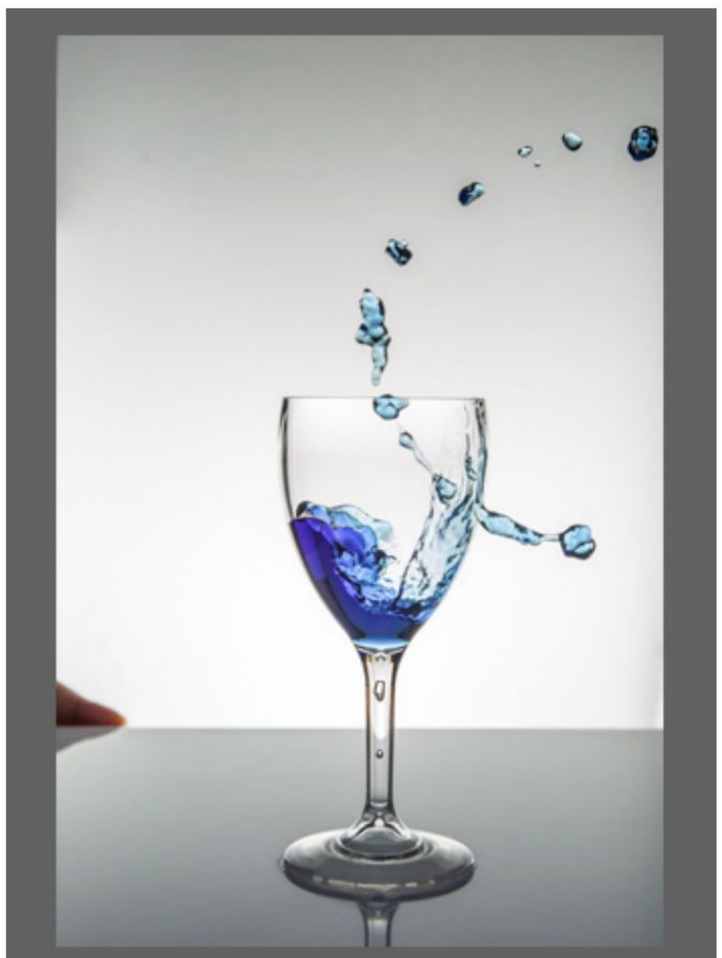
A cable release is a handy piece of equipment. It means you don't have to touch the camera once it is set up.

Some of the shots that didn't make it are shown here. Note that they were shot in Raw format to give us maximum quality at the processing stage.



wine_spill_072.CR2

wine_spill_093.CR2



wine_spill_102.CR2

wine_spill_088.CR2

First attempt

This is a two person operation. One would be responsible for sliding the sheet, with glass attached, into position, and one would be ready with the cable release to fire off a burst of shots as it comes to a halt and the liquid spills. The perspex was drawn back out of shot and after a countdown, was slid quickly into frame and stopped when the sheet contacted the far wall. At this point the camera was fired via the cable release and several shots of the result were recorded. The results were reviewed on the camera's LCD screen; we could see that two of the shots had captured some great splashing. It worked. Now it was time to clean the surfaces of all the spilled liquid and set it up again for another try. We did four attempts and got some very cool images.

Post processing

All we had to do now was get the shots back onto the computer and review them. We were pretty happy with the results and picked out four favourites and one base original as comparison.

Because the scene was essentially monotone apart from the coloured liquid, it meant we could alter the hue and saturation of the splashes and get different colours without having to mix food colouring whilst we were shooting. Our gravity defying trick shots were complete! ■

Food photography

Get arty with some everyday food items

Back in the day, it was always something of a cliché to shoot or paint a bowl of fruit as an indoor still life project. It doesn't have to be that way, especially in the world of digital photography. Using fruit as your still life subject can be given a little twist with this easy to setup tabletop project. Rather than having a bunch of fruit in a bowl, how about something a little more creative? Sliced fruit pieces are a lovely, translucent material, in a range of great colours. All well and good, but what if you shine a strong light through them? Now things get interesting. Suddenly the fruit glows and internal shapes and structure are seen. This is not how you normally see fruit and it sounds like a great image to capture.

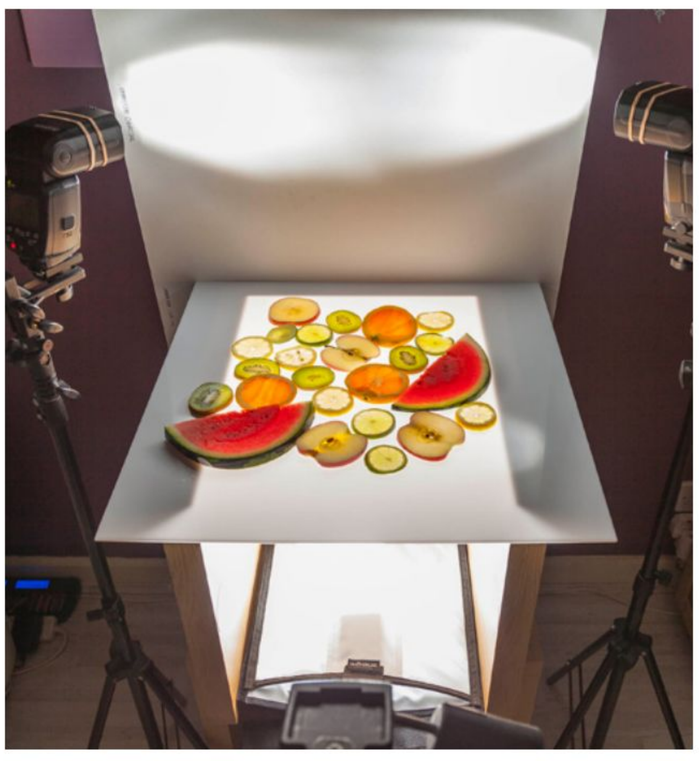
These two comparison shots demonstrate the key visual difference that can elevate your food images away from the mundane. The image on the left is lit in a conventional way where the surface of the fruit reflects light as you would expect. The shot on the right is lit from below so now the light is transmitted through the flesh of the fruit and your food is suddenly given a great new look.

Box clever

To achieve this, you would need a light source of some sort that you can arrange your sliced fruit on. An old-style light box for viewing slides and negatives sounds ideal but they aren't necessarily just lying around your house waiting to be used. As an alternative, you can use a plastic storage box lined inside with some thin white paper that you can shine a powerful torch or lamp through to give you your light box. For our example, we are going to use a 500mm square sheet of white translucent perspex purchased online quite cheaply.

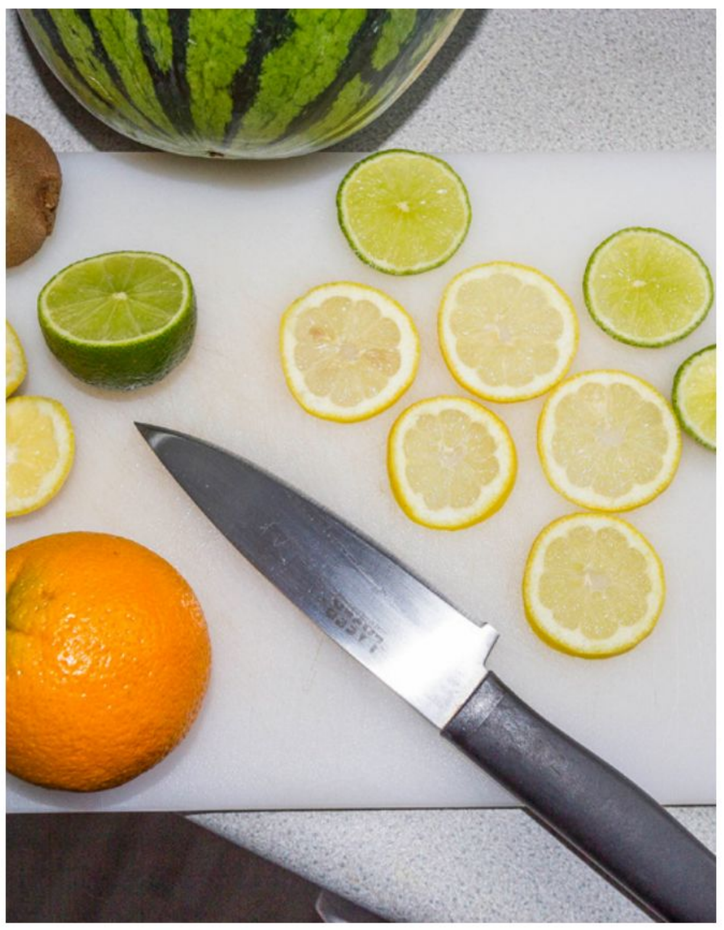
Setting up

The perspex is set on the legs of a small overturned table and one flashgun is set underneath to fire upwards into it. A two-flash setup is used above to create some fill light by bouncing off a piece of white card onto the perspex surface and cast some illumination on the slices of fruit. Our camera and a 24-205mm zoom lens is set up in front and above to capture the image. All flashes are controlled wirelessly but you can easily replace flashes with lamps or powerful led torches.



Slice and dice

Now we need fruit. The citrus and pulpy type fruits are perfect for this kind of shoot. They have great texture and colour. This example employs apples, oranges, lemons, limes, kiwi and water melon. The trick is to slice them nice and thin. Too thick and the light will have trouble passing through them. Slice up as much as you need (or have room for on your home-made light box) and arrange the slices to suit your needs. Our example is just a random assortment laid out on the perspex sheet.



Dialling it in

Now we need to do a few test shots. After some test firings we have our settings dialled in. Bear in mind, if you are using lamps or torches, your exposure times will differ. Just make sure the most powerful light is the one underneath, shining through the fruit. The flash underneath firing up into the fruit was set on 1/16 power, whilst the two flashes above were each set at 1/64 power. The camera was dialled in manually at ISO 50, aperture f/5.6 and shutter speed 1/160 which is the max sync speed of the camera. This made sure the bottom light is getting through all the fruit slices without over-exposing any of them.

Variety

Now it's just a case of shooting away to your heart's content. Rearrange your fruit as you see fit. Try different angles and zoom levels. In our example, it was quickly realised that having the camera on the tripod was too restricting so we went hand-held with it instead. As the camera settings had given us a shutter speed of 1/160 and the flash duration itself was effectively freezing any movement, we could shoot without worrying about camera shake of motion blur. For a spot of variety, the 24-105mm zoom lens was swapped out for a 100mm f/2.8 macro lens for some close-up detail work. Shooting with the lens at its widest aperture of f/2.8 meant the power of the flashes had to be adjusted. The flash firing upwards was adjusted to 1/32 power and both top flashes were set to 1/128 power.

Pick your fruit

Once the shots were in the bag, they were reviewed and the favourite images processed through a raw editing program, in this case Adobe Camera Raw. There were some interesting compositions that would not look out of place as large format canvas prints. Creative dropping also heightens the abstract feel. In fact, the only problem that remained, was what to do with all the fruit that was left over. Fruit salad anyone? ■

Still life photography

Sounds simple, but still life is a demanding art form

Still life photography is defined as the depiction of an inanimate subject. You are probably familiar with classic paintings of still life subjects which often tend to be bowls of fruit, bottles, and flowers. Although some might frown upon photographing a still life that mimics an old painting, it actually takes a deft touch with lighting and a skill in knowing how to set up and arrange your particular subjects. In fact, it is said that a still life photographer is 'making' a picture, rather than 'taking' it. Of course still life is not limited to bowls of fruit and such, but on a rainy day, when you're stuck indoors looking for a photography project, a good still life can teach you a lot about light, texture, contrast and composition.

The two images above represent the key difference between 'found' still life images and 'created' still life images. The image of rusty old tools in a tool chest on the left could easily have been found by the photographer who decided to record it as it was discovered. The image on the right is obviously a deliberate creation, and has the hallmarks of being lit in a studio environment.

Still life does fall into two categories. The first is 'created' still life which, as the title may suggest, is where the final scene has been crafted and constructed with a deliberate final result in mind. It may also have been lit by artificial means. Daylight or any ambient light was not present in the final shot. The second type is 'found' still life. This is a subject that has been found and its arrangement has occurred by natural means or at the very least had no input from the photographer in creating the scene that they shot. It is as they found it.

Creating a still life

For our example, we are going to assume it's a bad weather day, and we'll set something up indoors and create a still life. Where do you start? Well, the best idea is to start with something simple, on a simple background, with simple lighting. Sounds simple, right? It is good practice to begin with an object that is non-reflective, if you're new to still life photography, you don't want the additional headache of dealing with unwanted reflections if you're not able to black the room out. Once you've made your executive decision about the subject you are going to capture, you'll need to build a set for it to inhabit. You'll need a surface or backdrop to create your environment for the subject. It can be as simple as the surface of a wooden table or a piece of fabric, cloth or canvas.

Set the scene

Light backgrounds have a light and pleasant mood, whereas dark backgrounds are more dramatic. It is generally held that the background colour should be of similar tones and colours as your subject, perhaps just a shade lighter or darker than the main elements. Although that is the rule, you can experiment with colour combinations that suit your taste.

Your subject

With a background set up, it's time to introduce your subjects. The beauty of still life work is that you can shoot literally anything you want. You can amalgamate several disparate elements or harmonise the subjects to your heart's content. There is a quoted maxim that arranging objects in odd numbered groups (1, 3 or 5 etc.) is more harmonious than even numbered groups. However you do it is up to you.

Lighting up time

When you have your background and subjects ready, it's time to introduce light. This can be as simple as arranging your scene next to a window on an overcast day and using the soft natural light. If that is not an option, then there is no reason you couldn't employ a couple of desk lamps as your primary light sources. Bounce the light of a nearby wall or piece of white card to create a much larger softbox effect to reduce the appearance of harsh shadows due to small light sources, or place the lamp a distance behind a white sheet and turn the sheet into your light source. Some white card can also be used as reflectors to bounce a little light back into the scene to reduce the depth of the shadows.

A simple grey faux leather fabric creates a great backdrop for your still life composition.

Although our final set up uses flash lighting, you can use desk lamps, torches and household lighting such as this bedside lamp shown on the left and still get a great result as seen in the main picture above.

On the left of the set up is the flash used at the 4 o' clock position with an orange gel. The flash on the right had a large white sheet hung over it to increase the apparent size of the light source to create softer shadows.

Getting in the mood

In our example, we were going for a moodier look. Something that looks more like an old 17th century oil painting. In fact, a Google search for 17th century still life paintings will provide you with many inspirational references where you can study how they chose to capture the light in their scene. Our example was set up on the dining room table with curtains drawn to subdue the ambient light, it was the closest we could get to having the room blacked out. A local fabrics shop had a couple of interesting leather-effect sheets you could buy off the roll. We had a meter each of a grey and a brown textured material, ideal for our backdrops.

Lights and camera

We were working with two wirelessly controlled flashes as our primary sources of light. The camera was set up on tripod to avoid camera shake, and a favourite 24-105mm f/4 lens gave us ample compositional and framing scope of our first subject on the grey material which was a house-warming gift, plus a candle and a piece of jewellery. The subjects were arranged and the lights were set. The process began to dial in both camera settings and the power required of the flashes to light the scene.

Settings

We ended up with one flash at 1/2 power shooting through a large white sheet to mimic a window and the second at 1/64 power with an orange gel placed over the flash to cast a warm glow across the back of the scene. The camera was set at a shutter speed of 1/100th of a second, an aperture of f/8.0 and ISO 100. We would have chosen a shutter speed at the camera's x-sync speed of 1/160th of second, but the camera was an older Canon 5DMK2 and the wireless controller was designed for newer Canon cameras such as the 5DMK3 and the 7DMK2. As such, the controller limits how close you can get to the top x-sync speed and will not let you use high-speed sync at all, which is a shame. However, the settings we had were fine for our set up so we could get shooting.

Shooting the first scene

We shot a few frames, tweaked the position of both lights. If you imagine the camera is at the 6 o'clock position, the main flash with the white sheet over it was at the 4 o'clock position and the flash with the orange gel was at the 10 o'clock position, aimed at the grey leather-effect background. This created some nice shadows across the scene and in the petals of the flowers. Try to avoid front-on lighting as it has a tendency to flatten objects out. Shadows help create a sense of depth and give a more 3D quality to your image. The final thing to do was light the candle. Our camera's shutter speed settings were such that enough of the ambient light in the scene could still show up in the shot, so the brightness of the candle flame was not lost each time the flashes fired. A small amount of smoke from the lit candle also showed up very well in the shot, adding to the scene.

"The colours of the bottle and the brown leather complimented each other well, and the orange gel from the second flash added greater warmth to the scene."

f / 8.0 1/100
-- ISO 100

Once the lights and camera settings were dialled in from the previous set up, shooting the second scene was just a case of making sure the lights were in the right place so as to avoid showing up on the glass of the bottle and the tumbler. For any remaining unwanted reflections, the image was processed, opened in Photoshop, and any remaining issues were cloned out of the image.

Next up

Having captured the scene, it was time to set up the next one. This was a subject close to the heart, and liver, of the photographer. We set the brown leather sheet up as we did with the grey one and placed a bottle of single malt scotch that had an interesting bottle design, a glass tumbler, and the cork from the bottle in position. Happy with our lights from the first scene, we could use the same settings as before and just frame the shot as desired. A few test shots and some light position tweaks, we could finish preparing the scene. Some cool spherical ice cubes were placed in the glass, and scotch was poured into the glass from a beaker. The colours of the bottle and the brown leather complimented each other well, and the orange gel from the second flash added greater warmth to the scene. The scene was set and we could shoot. As we mentioned earlier, watch out if using shiny surfaces in your shoot. Be aware of what reflections are appearing in your objects. We used a little positional sleight of hand to make sure most unwanted reflections of the camera and tripod were hidden by the bottle label.

Post processing

All that remained was to download the shots and pick out the favourite one from the shoot. The processing was fairly straightforward. We added sharpening, some saturation, and also a dark vignette to make the edges of the shot darker to add the mood we were seeking to create and we were done.

Why not try your hand at still life photography? Whether 'found' or 'created', still life is a very good exercise in arrangement, composition, and lighting skills, and well worth a go. ■

BLACK & WHITE PHOTOGRAPHY

We outline the essentials for successful black and white photos

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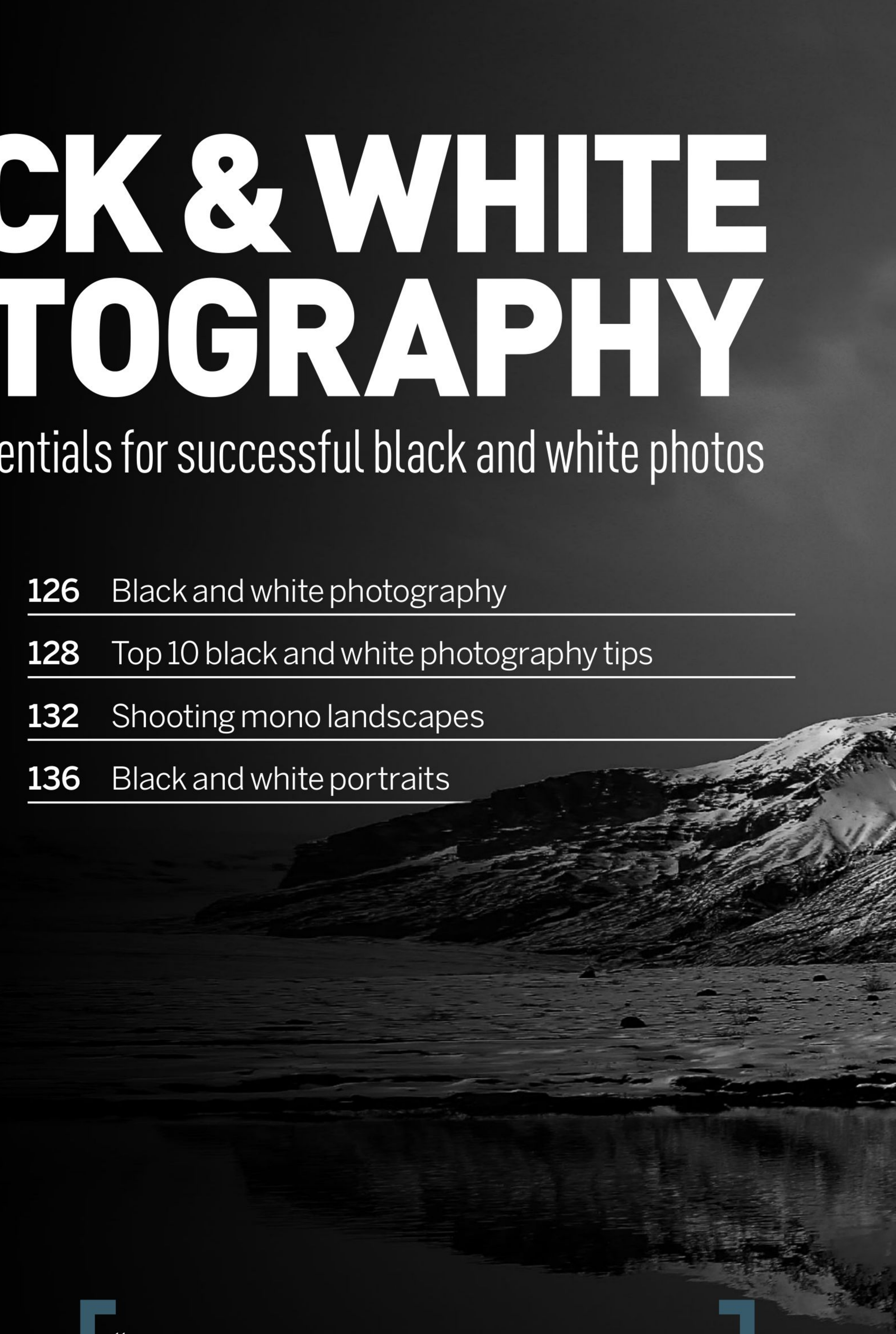
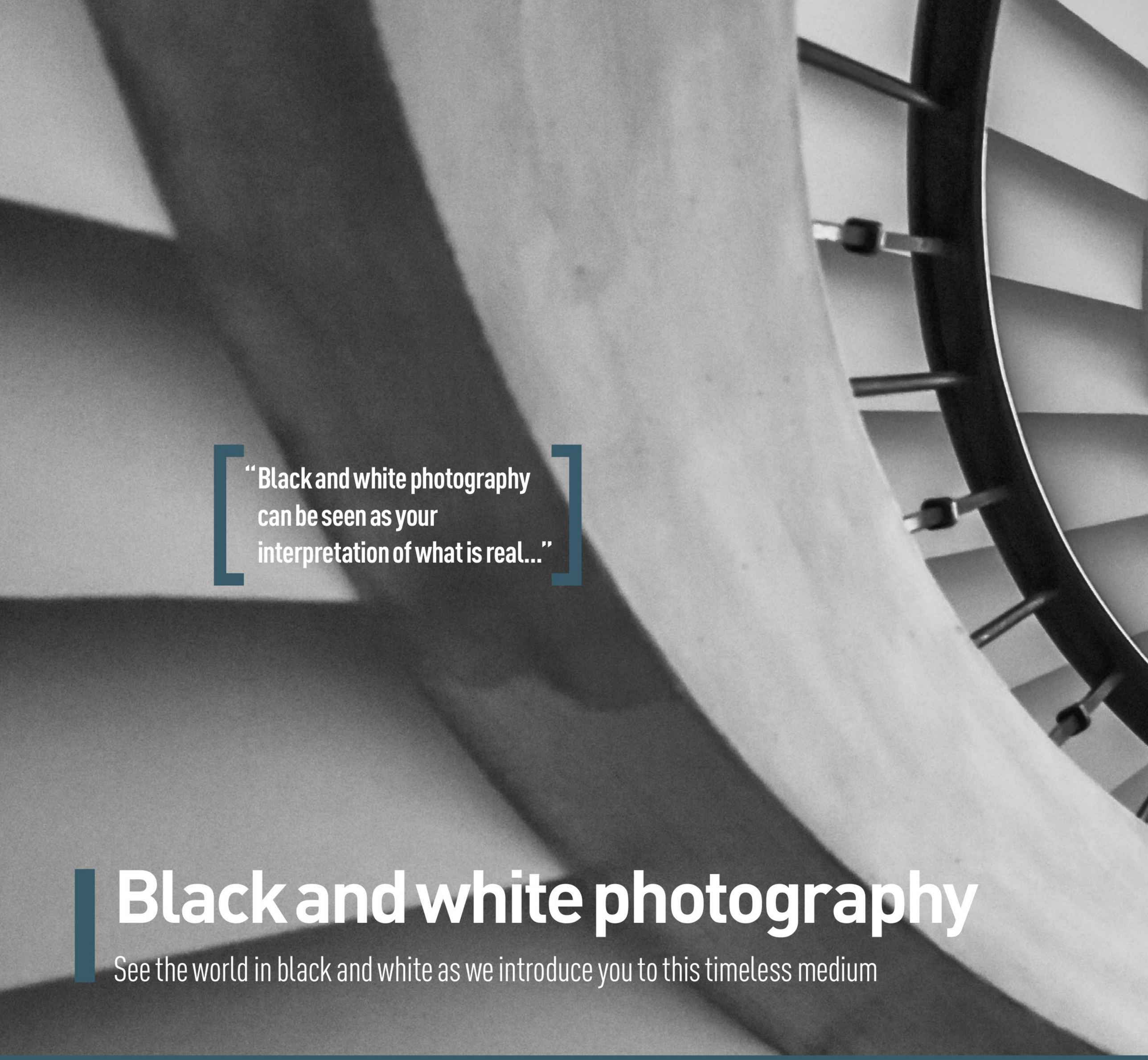


See the world in black and white as we introduce you to this timeless medium. At the dawn of photography as we know it, when everything was fresh and new, you had no choice but to shoot in black and white. Exposing images onto glass or metal plates gave way to the film and chemical process and now digital. Black and white photography didn't die off like the black and white TV; in fact it flourished.

Whichever way you look at it, colour distracts you from the heart of what should make a great photo. Things like texture, composition, form, lighting and good old storytelling can be swamped and made inconsequential by colour. It's not to say that colour is an invalid medium. Black and white photography can be seen as your interpretation of what is real, whereas colour can feel more like a record of reality. Shooting in mono is a medium that adapts very well to any kind of lighting situation. A shot taken on a cloudy day in colour feels dull; the same shot in mono feels moody. A colour image can be said to shout at you for attention, whilst a mono image speaks to you quietly in a more personal way. In the past, shooting in black and white was not seen as a limitation of the technology at hand, more a creative choice. The popularity of the medium today would suggest many still feel that way.

In essence, many photographers would argue that black and white is probably the purest form of photography. We could fill an entire book with the intricacies of the black and white art first pioneered by great artists such as Ansel Adams, David Bailey, Richard Avedon, Man Ray and Cartier Bresson, but there are some simple tips that can help you on your way to discovering why black and photography is such a prized and creative visual medium. ■

"A colour image can be said to shout at you for attention, whilst a mono image speaks to you quietly in a more personal way."



> "Black and white photography can be seen as your interpretation of what is real..."

Black and white photography

See the world in black and white as we introduce you to this timeless medium

At the dawn of photography as we know it, when everything was fresh and new, your only choice back then was to shoot in black and white. Exposing images onto glass or metal plates gave way to the film and chemical process. It wasn't until 1936 that Kodak gave the world colour photography. However, black and white didn't die off like the black and white TV; in fact it flourished.

Whichever way you look at it, colour distracts you from the heart of what should make a great photo. Things like texture, composition, form, lighting and good old storytelling can be swamped and made inconsequential by colour. It's not to say that colour is an invalid medium. Black and white photography can be seen as your interpretation of what is real, whereas colour can feel more like a record of reality. Shooting in mono is a medium that adapts very well to any kind of lighting situation. A shot taken on a cloudy day in colour feels dull; the same shot in mono feels moody. A colour image can be said to shout at you for attention, whilst a mono image speaks to you quietly in a more personal way. In the past, shooting in black and white was not seen as a limitation of the technology at hand, more a creative choice. The popularity of the medium today would suggest many still feel that way.

That may all sound a bit mystical, but in essence, many photographers would argue that black and white is probably the purest form of photography. We could fill an entire book with the intricacies of the black and white art first pioneered by great artists such as Ansel Adams, David Bailey, Richard Avedon, Man Ray and Cartier Bresson, but there are some simple tips that can help you on your way to discovering why black and photography is such a prized, creative medium.

You would imagine that the starting point would be to grab your camera, set its functions to black and white mode and start shooting. Many photographers always shoot in colour, in order to maintain as much tonal variation in the Raw image as possible; it just gives

you more data to play with when it comes to the conversion process. A key word in the last sentence was ‘Raw’. Always shoot in Raw format. You want to record as much scene data as you can without your camera trying to process the image for you. Although it might sound odd, you need to develop the ability to ‘see’ in black and white. A great visual aid is to shoot Raw, as we’ve said, but also to set your camera’s picture style to black and white. It displays a black and white image on your LCD screen, but all the colour data is still there.

In its most basic form, a photo in black and white is made up of several components. Texture is a key ingredient; black and white loves texture. Harsh midday sun knocks everything flat, but the light glancing across a scene at sunrise or sunset makes texture ‘pop’ out of the image.

Tonal contrast is another important consideration. A flat image with very little contrast will not necessarily convert into a great black and white shot without some serious post-processing; although in some cases, low contrast images can be very visually appealing if done well.

Shape defines how an object looks in its simplest form, as an outline or silhouette only. Images based on shape alone can be graphically intense. Form shows how something has depth and dimension. How an object is lit and casts shadows within its environment is the key to showing its form.

As mentioned before, we could fill an entire magazine on black and white alone. Here though is some great info and inspiration to get you started. ■

Top 10 black and white photography tips

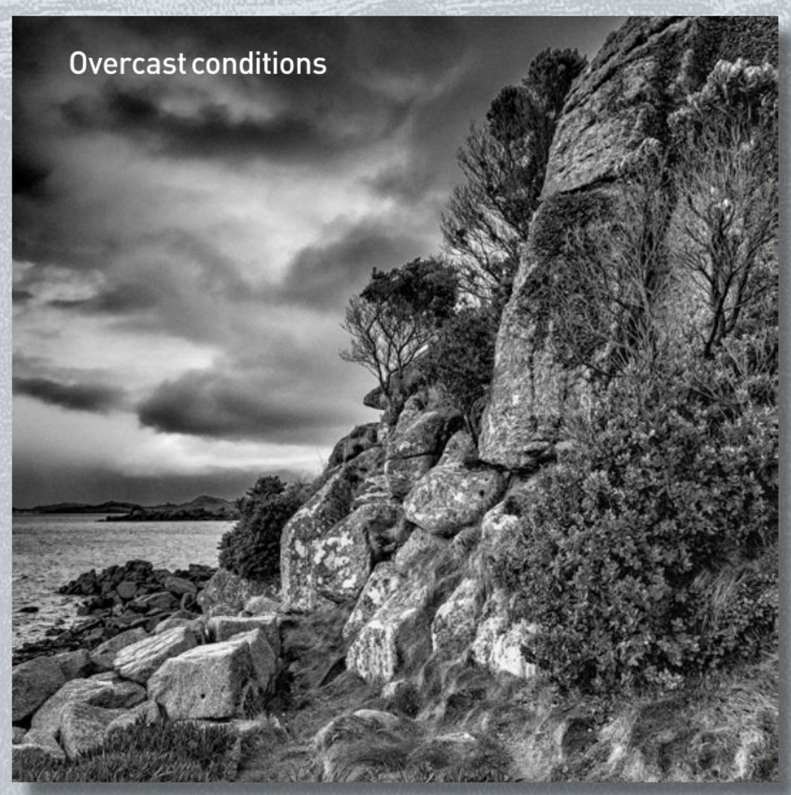
Our quick reference guide to getting started in the world of black and white photography

The following pages detail some of the main elements you should be keeping in mind as you start out on your black and white journey. Naturally, as you develop in both skill and confidence, you will find through trial and error what works best for your particular creative vision, which you will want to be seen by the world. It is by no means an exhaustive guide, but hopefully it can set you on your way by outlining what are generally regarded as the essentials for black and white photography.

1

The best conditions

The truth is, there aren't necessarily any best conditions in which to shoot black and white. Some mono shooters actually prefer to take their shots on overcast and generally dark days. The low contrast seems to be a draw for these photographers. Certainly, a grey cloudy sky can be made to look very moody and dramatic, as opposed to a blue sky with white puffy clouds. A lot of it will come down to your personal preference and mono conversion technique. However, just because it's overcast it doesn't mean there aren't any interesting image possibilities to be found out there.

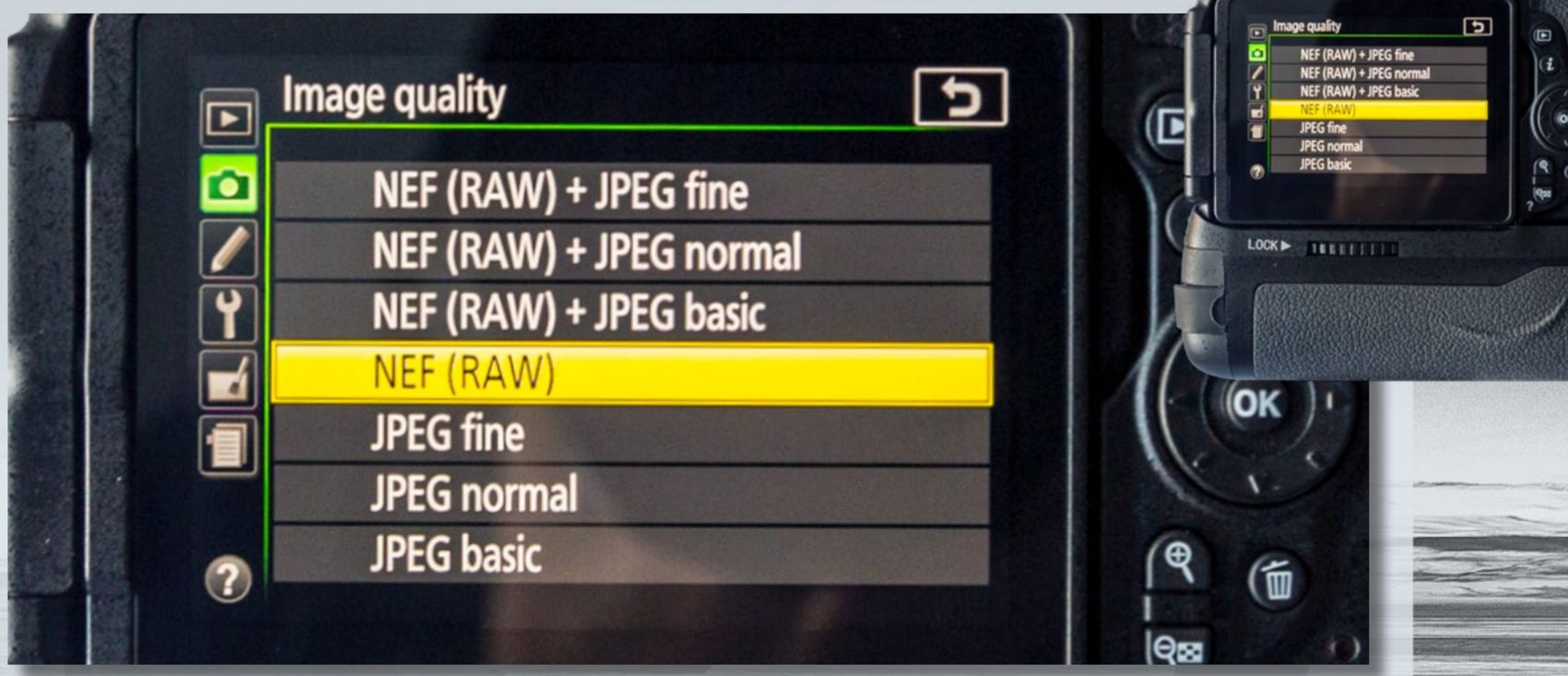

Overcast conditions

Sunny conditions

2

Shoot colour and Raw

A lot of modern cameras have so-called creative functions that give you the option to capture your images in black and white at the outset. Doing this may actually result in a loss of tonal range. If you shoot in colour and especially in Raw format, you will be capturing the full gamut of tonality that your camera's sensor can see. This is a much better starting point with more control than an in-camera mono image. It won't stop you if your camera can't shoot Raw, and you have to use jpegs instead; just keep them in colour.



3

Keep your ISO low

The lower your ISO, the less grainy the images will be. If it means you need a tripod to handle slower shutter speeds, then that is a good thing. Shooting from a tripod tends to slow down the shooting process and can be more considered. Too often a camera's ISO setting will be left on auto, pushing up ISO speeds to make sure there is no camera shake. The downside is that higher ISO equals higher noise in your image, which will only be exacerbated by the post-processing stage. You can always add grain, if you think the image will somehow benefit from it, during the processing stage.

4

Consider HDR

A High Dynamic Range image is the fusion of three standard bracketed low dynamic range images that are combined to produce a single image that covers a much greater range of tonal values from the darkest shadows to the brightest highlights. Usually two or three stops apart, these LDRs, when fused together, capture more light data in a scene than a single shot can achieve on its own. As a by-product, you also get a lot more detail in the shots. Perfect for scenes with lots of texture that you can bring out in the conversion stage of your workflow.

5

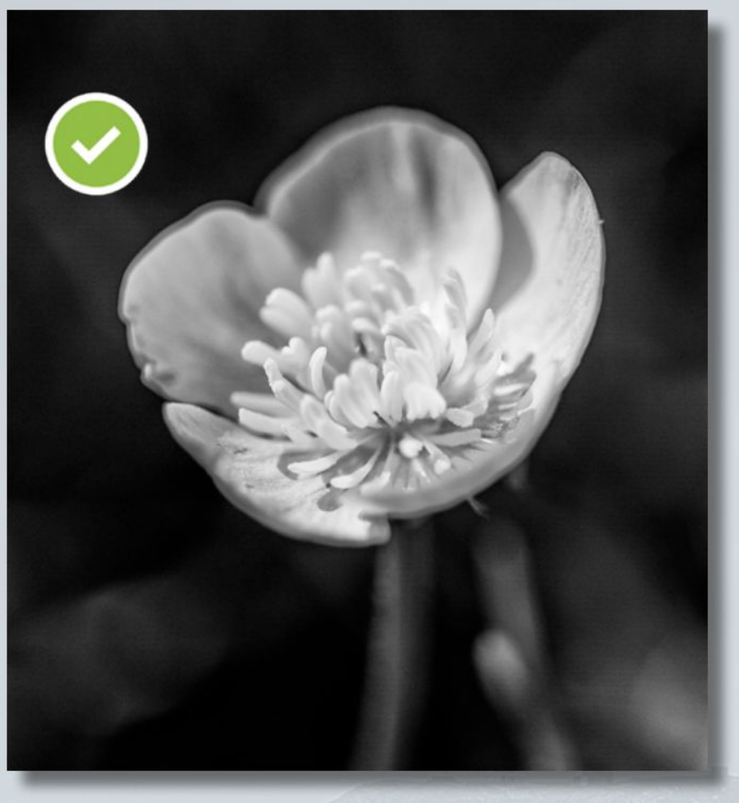
See the light

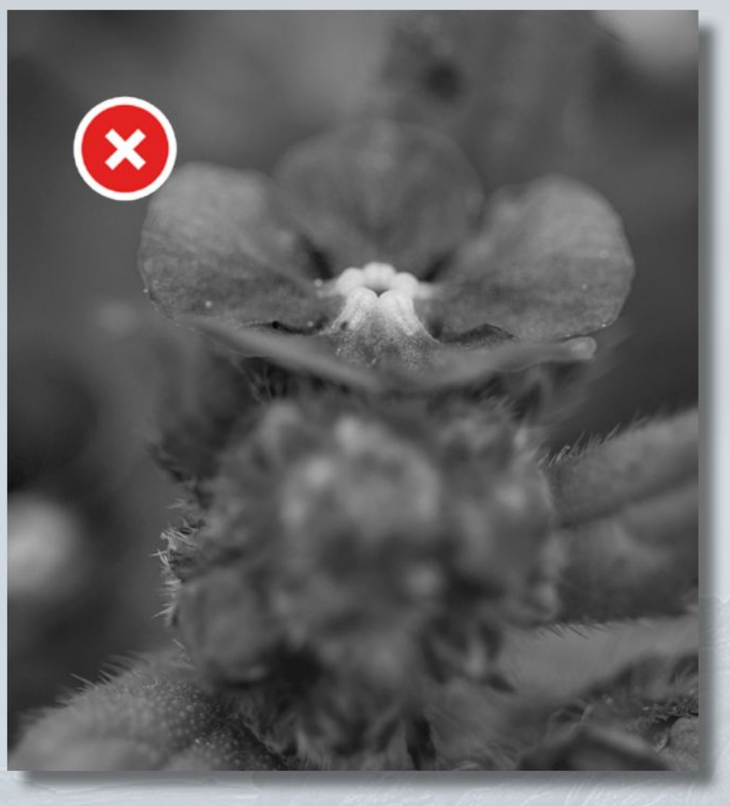
Your image can stand or fall on the quality of the light in the scene. It is generally held that midday sunlight knocks detail flat and creative possibilities are more limited. For landscapes particularly, the first light of morning or the last light of evening is a much more prized commodity. Light glancing across the land picks out details, throws long dramatic shadows and enhances contrast. You can use this great light for mood and drama that is absent when the sun is at its zenith.

6

Consider your subject

Trying to think in black and white - that is to say, trying to visualise the scene in front of you with all its colour absent - is a good skill to try and develop. The simple question you have to ask yourself at the outset is whether the resulting image would be improved by being in black and white, or would colour be the best thing for it. At the end of the day not every image will work in black and white. Sometimes the removal of colour can also remove differentiation between objects that could easily be distinguished were they in colour.





7

Compose yourself

The basic rules of thumb that apply to general colour photography also apply to black and white. The rule of thirds, golden ratio, leading lines, framing and viewpoint are all well-established guidelines that can make even the simplest scene stronger with some care and attention given to the composition of the final shot. Now, having said that, sometimes rules can be broken. If you find your scene somehow doesn't conform to a standard rule, take the shot anyway. Now and again it's refreshing to shoot something 'just because...'!

8

Shape and form

In black and white particularly, shape and form become very important to the success of the image. Converting to black and white means you can no longer rely on any colours in the scene to define or differentiate your subject from its environment. You need to be able to take the shapes, lines and forms available in the shot, and use them as the method by which the image is given an obvious focal point or object of interest.

9

Emerging patterns

The shift from colour to black and white often reveals details that might otherwise have been hidden under the obscuring cloak of colour. Colourful items in a shot can be distracting, as we've already mentioned, sometimes to the point of masking very interesting but perhaps subtle patterns that can only be appreciated once colour is removed from the scene.

10

Texture adds interest

Can you imagine how flat and featureless our world would be without texture? You need to bear that thought in mind when you shoot for black and white. A mono image and texture are inextricably linked, and part of the overall success of an image depends on there being elements that can show depth, dimension and contrast. Textured objects reflect light in interesting ways and draw the viewer's eye into the scene. A combination of textures in your mono image is a winning formula.

> “First of all, take time to research your possible shooting destination if you have not been there before...”

Shooting mono landscapes

Some essential things to consider before you step out into the world

Although there is no real right and wrong to shooting landscapes, there are a few tips that can elevate your shots and have them stand out against the general background noise of countless dull shots. First of all, take time to research your possible shooting destination if you have not been there before. Just Googling the location you want to shoot will call up all sorts of information. Most of it may be useless to you, but you can guarantee that there will be examples of other photographs taken there. The experiences of other photographers in this location will give you the heads-up as to whether it is an easy or difficult place to reach. There may be tips concerning local by-laws and the best nearby parking spots etc.

There are also apps available that can tell you where the sun will be at any point on any given day. These apps can overlay information on a map of your given destination, showing where the sun will rise and fall, and where it will track through the sky on whichever day you choose. This is great for working out what time is best for you to shoot in the location you are researching.

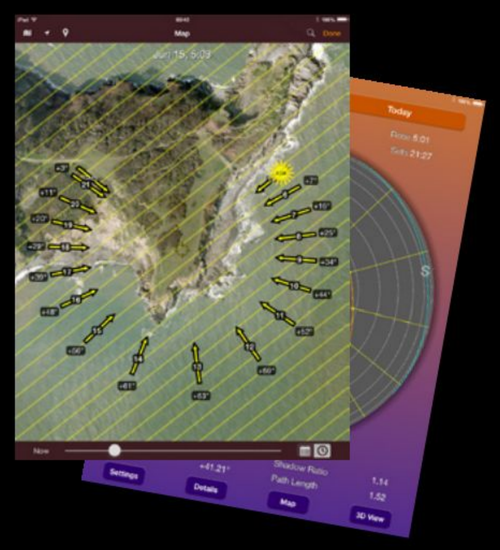
Make sure you dress for the conditions you are shooting in. If you are going to be on rough terrain, then sturdy shoes are essential. A sprained ankle, miles from anywhere, could be very unpleasant. Make sure someone knows you are out there and that you have your phone with you at all times. You never know. ■

A tripod is a must for landscape work. You may be working in low light conditions and handheld shots are not going to yield sharp images. You might also want longer exposure times to render water soft and misty, or show clouds moving in the shot over a number of seconds for added drama. There are plenty of strong, lightweight tripods to choose from that won't be a chore to carry with you on your shoot. Couple a cable release with it and you are taking big steps in reducing any unwanted camera shake and vibration.

Think about investing in some filters. A circular polariser is very useful. It can boost the contrast in blue skies and it is very useful for reducing or even eliminating reflections in water. Additionally, manufacturers such as Cokin and Lee produce a wide variety of filter types; but if you are serious about your landscape photography, probably the single best one you could purchase is a neutral density graduated filter. If you are shooting a scene where there is a large difference in the tonal values between your land and a bright sky, the ND grad will help stop those skies from burning out.

Don't always assume that your landscape has to be shot with the widest lens you have. Sometimes a longer focal length is great for picking out distant details that a wide-angle lens could not. Zoom lenses are also a good choice as they allow you to zoom in and out, allowing you to crop your shots and alter the composition without having to move large distances. Don't forget to shoot in portrait orientation too. Keep experimenting.

If you take nothing else, always have a tripod with you. Even a cheap light weight tripod is better than nothing at all.



The Sunseeker app available for iOS devices, is a very useful tool. It can show you the sun's position anywhere, any time of day.

The ND grad, probably one of the first filters it would be worth adding to your arsenal of essential accessories.

The AF-S Nikkor 70-200mm f/4G ED VR zoom lens. Excellent optical quality and ideal for picking out mid to long range details in your landscape shots.

This is how the rule of thirds has been applied to the shot. The sea and rock elements fall along the horizontal divisions and the rock sits on the intersection of two lines in the top right corner of the image.

Composition is a very subjective thing. What looks good to your eye may look odd to someone else. If nothing else, keep the 'rule of thirds' as your main compositional tool. Imagine that your frame is split by lines into thirds, both vertically and horizontally. Placing an object of interest at one of the points where these lines would intersect means you are adhering to the rule, and this will help bring balance to your shot. That's not to say you must always shoot by this rule. Rules can be broken, so it's up to you. Don't be afraid to try out different ideas. They may not always work, but have fun trying.

More often than not, many photographers will want their scene to be as sharp as possible from front to back. This ensures that a foreground object like a tree, and a distant object such as a mountain, are both as sharp as possible. This is where depth of field comes into play. At large apertures such as f/2.8, the area of sharp focus in front and behind the point of focus will be relatively small. If you use a much smaller aperture such as f/22, that 'zone' of sharp focus is much greater. As a very rough and general guide, if you focus on a point about one third of the distance into your scene, you are giving yourself the best chance of maximising the depth of field available.

Consider using longer exposures in your landscape shots. Photographers often employ exposures that last seconds, or even tens of seconds, to show clouds streaking across the sky rather than looking static and puffy. The classic is to shoot moving water using long exposures. Waves crashing against a shore with an exposure of one or two seconds show the water as a dynamic and powerful fluid; the same scene shot with a much longer exposure will turn the water to a misty, milky fog. It is safe to say that your tripod is the key to the success of these shots.

One golden rule that should not be broken is that you must shoot in Raw format. Raw gives you unprocessed and uncompressed image data to work with, in order to wring every bit of detail from each of your shots. The applications that are now available to process Raw images are extremely sophisticated and are an essential part of the workflow.

More important than any of the points raised here, be sure that you enjoy what you are doing. If you are loving the shots you take, it will show in the final result. ■

Screw-on ND filters are perfect for increasing exposure times to give you those misty water and cloud effects. They vary from a 1-stop reduction, all the way down to a 10-stop reduction.

> “If you want fashion, shoot in colour. If you want emotion, shoot in black and white.”

Black and white portraits

Add power and depth to your portraits through black and white

The power of the black and white portrait cannot be denied. A wise soul once said: ‘If you want fashion, shoot in colour. If you want emotion, shoot in black and white.’ As we’ve mentioned before, there is a power and depth to a black and white shot that is often swamped by colour. The story behind a shot is easier to comprehend when it is in black and white and the distraction of colour has gone. Even if there is no real story being presented in the shot, you can suddenly find yourself paying more attention to a black and white portrait. Texture, form and tone become important to the shot. It draws you in more than a colour shot ever could.

Although this portrait presents the subject side-on to the camera, the eyes are still the point of focus. It is a point worth remembering when shooting people in profile.

A basic rule in a close-up portrait is to have the eyes in focus. The eyes convey emotion - whether sad, happy, playful or mysterious. If the eyes are not in focus, then the connection to the subject is lost. That doesn't mean the subject must always be staring down the barrel of the camera lens. It is generally considered that if subjects are staring at the camera, they are portraying confidence or arrogance; if they are looking away, then they can be said to be nervous or mischievous. This is not always the case, but it can be a starting point in the portrayal of your subject. Even if the subject has their eyes closed or is facing away from camera, always think about making the eyes the point of focus. This can even be true when photographing non-human subjects. Dogs, for instance, are soulful creatures too, and our connection to them is through the eyes just like any person.

Head shot or portrait? The jury seems to still be out on that one!

The location you shoot your subject is also important. If you shoot in a studio with a plain backdrop, then the story is told only by your subject's face. If you shoot on a location, then it too can help convey emotion or a context. Shooting a portrait of a fisherman on his trawler or a lawyer in his office are some obvious examples where the location is expanding upon the story being told. It can be argued that a subject on their own, in close-up with no background, is a head-shot. A subject photographed in an environment that is part of the storytelling, is a portrait. A fine line perhaps, but there are those who would argue the definition.

Reflectors come in a wide variety of sizes and colour options. Perfect when you need extra light bounced back onto your subject.

Lighting is an interesting subject when shooting portraits for black and white conversion. There are so many different styles out there, it would be folly to try and pigeonhole one as being better than another. Light is there only to illuminate the story being told, or the emotion being captured. Just keep in mind the basics of lighting such as trying to avoid shooting in direct sunlight, as it creates harsh, dark shadows with no detail in them. Using a large white surface to reflect light back on to your subject will create a fill light that can lessen dark shadows. Alternatively, move to a more shaded area. If possible, avoid shooting with a camera-mounted flash, as you run the risk of getting 'red eye' where the light from your flash bounces of your subject's retina back into the camera causing the pupils to look red.

The AF-S 50mm f1.8G and AF-S 85mm f/1.8G prime lenses. Superb portrait lenses, great for soft, out of focus backgrounds for your portraits.

Also, give some thought to the lenses you use. Wide-angle lenses are not considered appropriate for close-up portraiture as they distort the features; but a good 50mm, 85mm or even 135mm prime lens is much prized for portrait work. Watch out for too much depth of field; it can be a great distraction for your background to be as sharp as your foreground. A little blur in your background is a great way to separate your subject from their surroundings, keeping them the focus of the shot.

Also, keep your eyes peeled for the classic error that can crop up, where an item in the background appears to be sprouting out of the top of your subject's head.

No, not a wizard's hat, just the spire of a bouncy castle directly behind this chap's head. An unfortunate alignment of objects gives us the classic error.

Try mixing it up a little when shooting. Close-up portraits are fine, but perhaps there is a great shot to be had in a full-length portrait. Trying both landscape orientation and portrait orientation is also good practice. It is also a great idea to try shooting from different levels, both above and below eye-level. Don't be afraid to experiment; you never know what you will discover. ■

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Once you have mastered your camera, its many features and delved deeper into the technical aspects of photography that can help you take better photos, the question invariably goes from 'How do I shoot?' to 'What shall I shoot?'. This is the point where a budding photographer is probably going to think about some projects to get involved with that can help them grow to become a more creative and confident photographer. This is also the point where they may hit upon a technique or genre that really speaks to them and become a specialist in that area. Until then, the photographer needs to get out and just enjoy the experience of shooting a variety of subjects and trying out new styles and ways of capturing the world through their cameras.

Over the following pages, we have assembled a number of diverse and creative projects undertaken with the aim of being able to pass on our experiences to you. They cover a number of techniques and styles and they show you how each was accomplished. Hopefully our projects guides will impart lots of useful information in the process to give you a good understanding of how you could achieve the same kinds of images yourself. Whether it's some guidance on shooting landscapes, dabbling with long exposure photography or learning more about lighting equipment, there's plenty to explore in these pages. If nothing else, our hope is that these photo projects will inspire you to get out there and learn more about this fascinating hobby. ■

"By learning and using a few simple techniques you can turn your photographs from well-taken snapshots into works of art of which you can be proud."

Assignment: The Black Rider

A photo shoot to pay homage to the Lord of the Rings

Being a photographer, you may be called upon to shoot many varied subjects. Some of them may not exactly be as exciting or creative but that is the nature of the job. Not all of us have the option to shoot in exotic locations with masses of equipment and a plethora of supermodels. In point of fact, the reverse is the norm for a jobbing photographer. You are more likely to be swapping Portofino for Portsmouth. Even though you may not be a jet-set photographer, there are times when you get to have some fun and have the chance to experiment with some great photographic and lighting techniques to deliver a finished result that the client is happy with.

The idea

Just such an opportunity came our way recently. Suzy, a close friend, is an avid horse lover and her two ponies, Splash and Baggins are her world. For some time Suzy has wanted to recreate scenes from the Lord of the Rings trilogy, incorporating the black riders. The black riders are also known as Nazgul or ringwraiths, the servants of the dark lord Sauron. In the first film, The Fellowship of the Ring, they chase down Frodo and his hobbit friends on horseback. Suzy wanted to fulfil an ambition to create a black rider costume and be photographed on her horse Baggins in a setting that mimicked the Shire, the home of the hobbits.

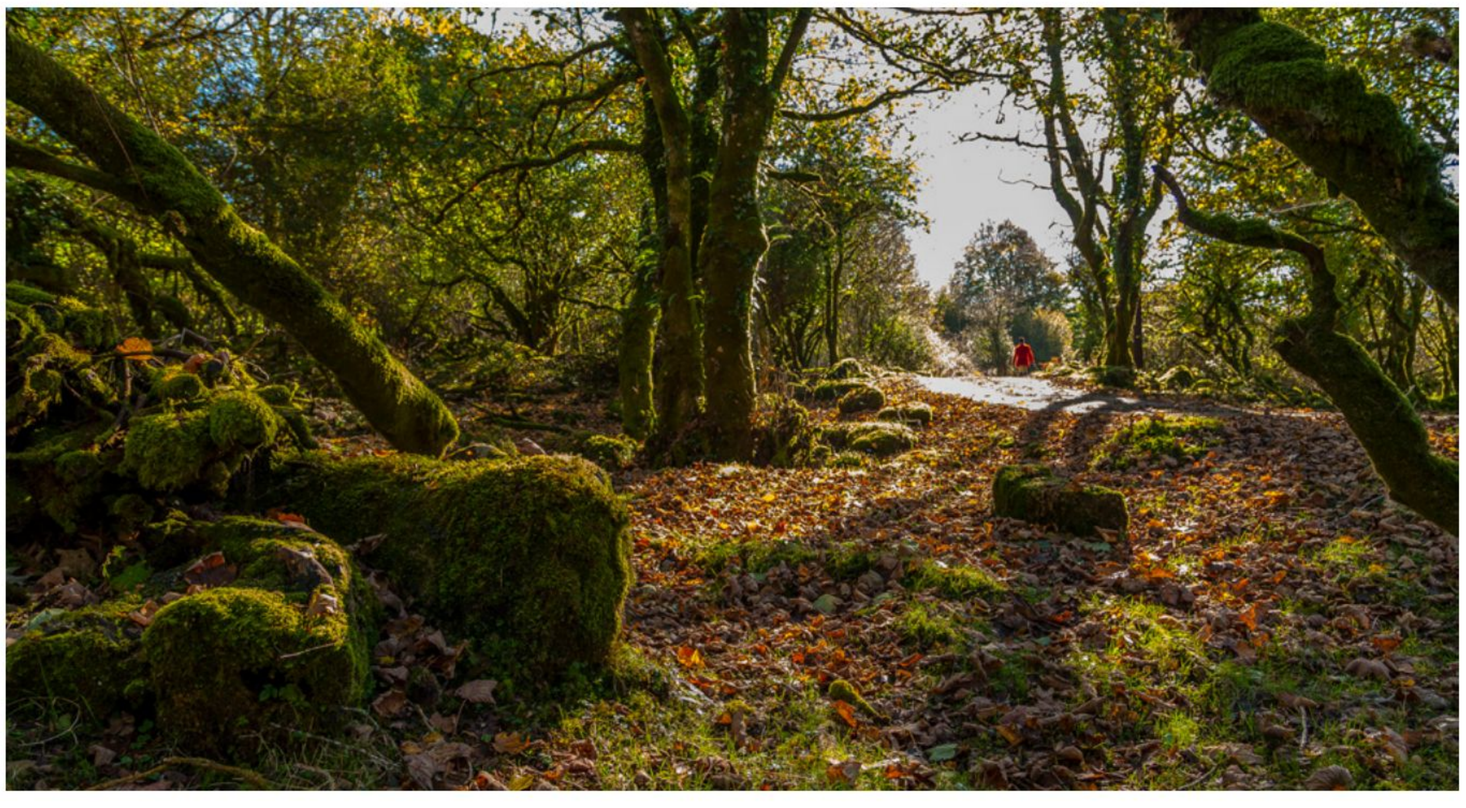
> "Even though you may not be a jet-set photographer, there are times when you get to have some fun and have the chance to experiment with some great photographic and lighting techniques."

The box below contains the camera settings used for the image on this page. When you view your photos on your computer using programs like Adobe Photoshop and Adobe Bridge, these settings are displayed. Look out for more boxes like this in our guides throughout the creative projects section.

Next step

The first order of business was to scout possible locations. It makes a lot of sense to reconnoiter a location to be certain it works for your particular requirements; just turning up somewhere and trusting to luck is a recipe for disaster. We brought a camera and took a number of test shots and arrived at three or four possible spots that could serve as dramatic backdrops to the scene. It was also a chance to check that Suzy's horse could manage the terrain of the chosen locations. What was also useful, was the chance to talk through ideas and poses for the shoot that she wanted and also what else we could try. The primary shots would be of Suzy, in costume, atop Baggins but there was also some scope to do some portrait work of the ringwraith character on its own. We shortlisted the shots we wanted to try and made that our starting point when we came to do the shoot. There were wooded areas with a stream running through that were close to the stables where Baggins is kept that meant we weren't having to hack across large distances to each location, so we had more time to play with ideas.

Baggins had been photographed with flashguns before and we knew that she had no aversion to them. They had been introduced slowly and gently with some very low power test flashes so she had time to get used to these strange devices. This is a key consideration when photographing animals: you will need to check that the animal is comfortable with the flashguns. It isn't necessarily the pulse of light itself that can spook an animal, sometimes the 'pop' of the flashgun can be enough to unsettle them.



If you can, always take the time to scout the location in advance of the shoot. It gives you the chance to walk around the area and see what shots may work or not.

The location shoot was done with a 24-205mm zoom lens [1] teamed with a canon 5DMK3 [2]. It quickly became apparent that the wider 16-35mm lens [3] was going to be a much better option in tight shooting situations.

1

2

Camera and lens

The benefit of bringing a camera along to a location scout is it gives you a better feeling for what focal lengths will work for the shots you are trying to achieve. Assuming it would cover all the bases, we took a Canon 5DMK3 DLSR and a 24-105mm lens. We quickly realised that in our chosen locations, we would be working at close quarters with our subject Suzy and her horse. Even at the short focal length of 24mm, we were going to struggle to get the shots framed with enough background left over to make an interesting composition. It was going to require an alternative lens of 16-35mm to give us a wide enough angle of view to make the shots work.

Lighting the shots

The lighting we wanted to use was not going to rely on available light in the scene at the time of shooting. We were going to use a technique that involved the use of flash lighting to illuminate the subject whilst deliberately underexposing the background. This can create quite a strong and slightly surreal look that we hoped would match the subject matter more, rather than just shooting in plain daylight. The only issue we faced was just what kind of weather we would be working with on the day of the shoot. Our hope was that the day we had chosen would be overcast since it meant that we would have to use less flash power to underexpose the background and still be able to light our subjects. It also meant that the shots would be more dramatic if we had dark rolling clouds as a backdrop. However, the day of the shoot dawned and it was a perfect blue sky day.

We have the power

The original intention was to use a couple of flashguns to light the subject. Now we had to rethink since to significantly underexpose a bright sunny day would require narrow apertures,

Flashguns like the Canon Speedlite are perfect for mobile shooting situations. There may be times however, when they just aren't powerful enough for your needs.

For cost-effective portable lighting with enough power to do the job, the AlienBees B1600 is a great workhorse.

Although not cheap, the lithium power packs for the B1600 can keep you shooting for up to 250 full-power shots.

the lowest ISO setting the camera could manage and a shutter speed that was as fast as possible without exceeding the sync speed of the flashes. The sync speed is the fastest shutter speed you can use where the camera's entire shutter is open at once and not partially covered by it when the flash fires. Otherwise you will see black bars in your photo and it will be ruined.

Although the background was meant to be underexposed, we still had to be able to provide enough illumination on Suzy and her horse to light them correctly, otherwise we would just have series of very dark shots. That meant the flashgun option was not viable. Good though they are, modern flashguns do not have enough power for this kind of situation unless you have a lot of them firing together or can get the flashes very close to your subject. We were going to be working with a horse and that meant we needed to have the lights at a reasonable distance from her in case she moved unexpectedly.

We needed to turn to a more powerful option. In this case, we brought our portable studio flashes with us. They can be powered by lithium battery packs that can provide about 250 full power flashes. These studio lights are much more powerful than a flashgun and we were going to use two of them controlled by a wireless trigger mounted on the camera.

Setting up

We arrived at the location and Suzy made Baggins ready and then got into costume. It was then a case of trotting down to the first location to get the settings and lights dialled in so we could get shooting. Rather than subjecting Baggins to a battery of test flashes, the lights were set up before the horse arrived. We used one of our party as a stand-in to get the lights and camera ready.

The first order of business was to set the camera up to underexpose the ambient light. We deliberately chose a shaded area so we wouldn't have to be working in full bright daylight to give ourselves a chance. We were using a Canon 5DMK3 with the EF 16-35mm f/2.8 L series lens. The 5DMK3 is a fairly old camera now but it still delivers quality 22MP images. The lens is a great wide-angle zoom which would let us get quite close to the horse but still be able to get a lot of background into the scene at the same time at the shorter focal lengths. Our preference is to shoot with our settings in full manual mode and in Raw format. After a bit of trial and error we had the camera set up. Aperture was f8, ISO was 50 and shutter speed was 1/200s. This is the 5D's max sync speed with the studio lights we were using. These settings were enough to darken the scene by a significant amount. Now we needed to fire up the lights.

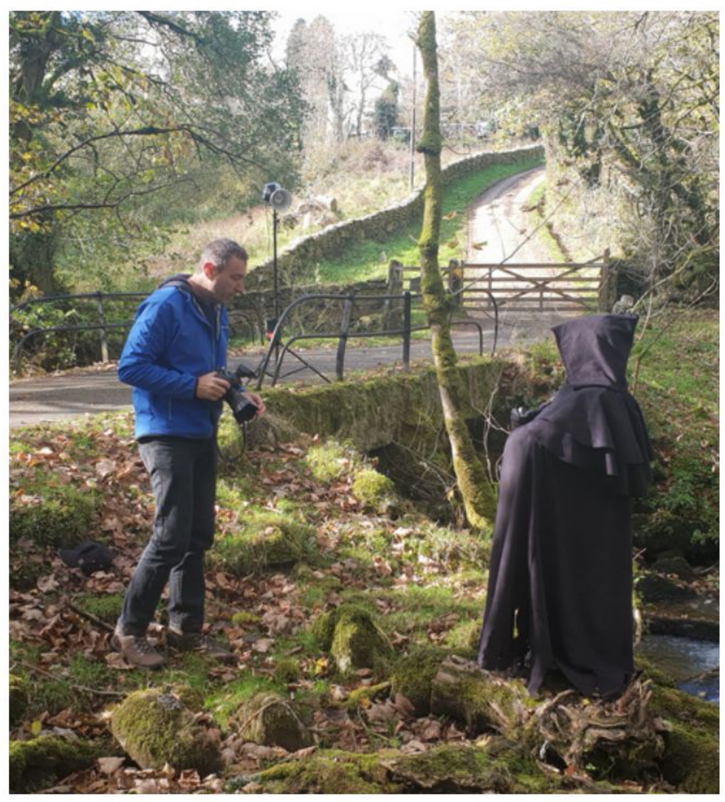
Lighting

The lighting setup was going to be very simple. The subject would be placed between the two studio lights and cross-lit. One light would have yellow gel placed over it to create some nice coloured rim lights on one side and general lighting coverage on the other. It quickly became apparent that at the distance the lights were from the horse and rider, they would both have to be on full power to illuminate them properly based on the camera settings used to darken the ambient daylight. Luckily, the lights are designed to be able to shoot at full power for extended periods. They have built-in cooling fans to prevent overheating. All we needed now was for Suzy to manoeuvre Baggins onto the shot. Horses can be wilful animals and Baggins would not always comply and stand where required. This wasn't too much of an issue since our lights were portable and we could quickly jockey them into different positions to suit the situation. Now we could shoot.

Shooting

When dealing with a large animal like a Dartmoor pony, you have to work quickly and carefully. You also need eyes in the back of your head. If the animal decides it's had enough and wants to move off, it's going and you can't do much about it. Suzy would get Baggins into position and we would try and nab some shots, then she would move and the lights had to be repositioned each time. It's a process and you just have to go with it. Luckily, Baggins was fairly compliant that day and we achieved a number of setups, done in a couple of locations. There was also a stream nearby and we had a go at setting up a shot there. Baggins immediately decided to start stamping her hooves in the water and it looked great, there was a concerted rush to frame the shot, get lights into position and shoot while the horse was stamping at the water. We took a few before she got bored! We also did a number of shots without the horse in the scene, concentrating on doing some Nazgul portraits in a couple of locations as well. All too soon the battery packs started flashing warning lights at us to let us that our shoot was coming to an end. It was okay though as we were confident we had a number of good shots in the bag.

The day was an excellent example of collaboration and some problem solving too in order to get the shots in the time we had.



Below is a rough illustration as to how the shots were made. Image [1] is what a normal exposure would have looked like with no alterations to settings for the bright conditions we were working in. Image number [2] shows the first part of the process. The camera's settings have been deliberately altered to underexpose the scene by about two stops, making it look quite dark. Image [3] gives an indication of how the first flash, to the right of the subject reintroduces light into the scene, but can now be controlled by the photographer rather than relying on ambient light. This flash is at full power. The second flash to the left of the subject [4] is covered with a yellow gel. At the angle we were shooting, it creates a bright rim light effect on the left side of the horse and helps to pick it out from the background. All the shots done that day were using variations of this setup.

These are actual examples of the results obtained before any post work was done with the lighting setup we described.

f/ 8.0 1/200
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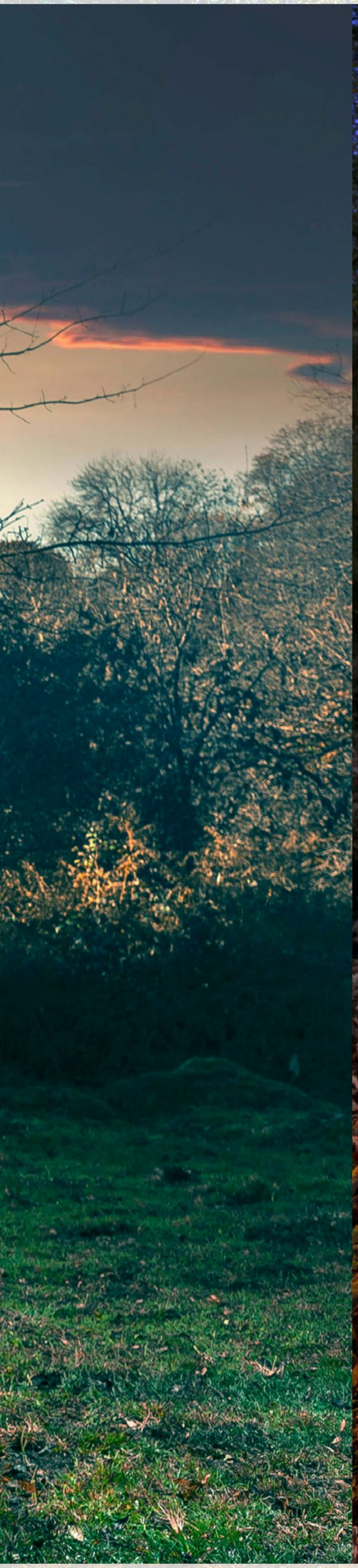
ISO 50



f/ 10.0
1/100
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ISO 100

Processing and post-work

Once we had downloaded all the Raw files onto the computer, the process of choosing favourites began. There were some obvious images that could be consigned to the trash immediately where one or both lights had not fired because they had not been given enough time to cycle after the previous full-power flash output. We had realised going in that there was going to be the need for some post-work to finish off the images. Despite trying to get as much done in-camera, there were a few things that could only really be done after the fact. One key issue was that despite the long hooded cloak and cowl that Suzy had been wearing, her face was not obscured and that would have to be addressed. The blue skies would also need to be replaced with something more appropriate for the mood of the scene. There was also one shot that would have a completely new character added behind the hooded figure of the Nazgul in the form of a dragon-like fell-beast. There was also an opportunity to take the basic outline of the Nazgul cloak and use Photoshop to add a more tattered and distressed look to it and also mud spatters for more authenticity.

fl 10.0
1/160
--
ISO 100

TOP TIP!
To grow as a photographer, you need to be able to step outside your comfort zone and try new things. You never know what great new technique may be waiting for you that transforms the way you look at your work.

End results

There were four main shots that were worked up to completion. One was a simple horse and rider portrait with a few tweaks to the colour and the sky was replaced. The shot of Baggins stamping in the water was also another favourite that had some work done to it with colour grading, the addition of a replacement sky and a tattered effect added to the rider's cloak. There was also a simple portrait of the Nazgul on its own in the forest. Some simple colour shifting at the processing stage produced a strong image with little pot-work done to it. The last shot also included a 3D rendered dragon that was composited into the photo for a full-on fantasy look.

This was a great project from start to finish and for any budding photographers out there, we would always say that it's very fulfilling to be able to shoot something completely different from what you're used to. Don't be afraid to step outside your comfort zone and try new things. With a little planning and a determination to get the shots you're after, you'll take your photography to new levels. ■

> “What if you don’t actually have the right kind of filter and really wanted to have a go at those kinds of shots. ”

Long exposures without filters

How you can shoot long exposures without the aid of neutral density filters

It seems everyone loves those shots of the sea or flowing water in streams that have been taken with a much longer exposure than normal to create the misty water effect. During normal daylight conditions, you would not really be able to get the length of exposure to render the water as that silky fog that is so popular. That’s where a 10-stop neutral density filter comes in. It blocks a large percentage of the available light, driving up exposure times into seconds, or tens of seconds. However, what if you wanted to take shots like that only to discover that you’ve forgotten your filter? What if you don’t actually have the right kind of filter and really wanted to have a go at those kinds of shots. Well, over the next few pages, we outline a method that can let you emulate the effect without the need for filters of any kind.

BEFORE

AFTER

The 10-stop ND filter is the usual go-to guy for long exposure photography. If you don't have one, or if you didn't have it when you needed it, here's a solution.

A tripod is definitely essential for this kind of technique where your shutter speeds are slower than you can comfortably manage hand held and not get excessive camera shake.

The 5DMK3 is one of Canon's most popular cameras. At 21 megapixels, it's not the largest sensor available for this kind of DSLR but it has great image quality. Coupled to a good piece of glass like the 24-105mm f/4 L series lens, it is a great all rounder.

Long exposure trick

Let's start with our original scenario. You set out to shoot some daytime long exposure images and arrive at your destination only to discover the 10-stop filter required to give you the long shutter durations needed is not in your bag. It isn't quite the disaster you might imagine as there is a handy workaround that could still yield you some great results. We will assume that in this case, you've got a tripod, camera and lens. The first thing you have to do is set up your camera and compose the shot until you have it exactly as you wish. It's a good idea to set everything to manual, including the focus. Depending on the available light, a normal exposure would be around 1/100 of a second unless the conditions are extremely bright. One of our examples of a stream was shot in a wooded area called Golitha Falls on a bright morning and we were getting an average exposure of around 1/30 of a second at an aperture of f/5.6. Not exactly a long exposure but we could get closer to our goal.

What you need

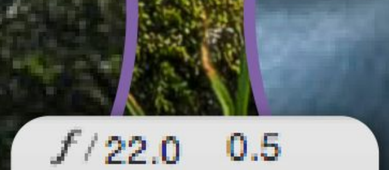
Well, if you had your 10-stop filter, this would have been a very short project. However, to recap, since we are trying to emulate its effect you'll need your camera and lens of course. We were using a Canon 5DMK3 and a 24-105mm f/4 zoom lens. It had a minimum aperture of f/22 that proved useful later. We also had a beaten up but sturdy tripod and a cable release attached so we didn't have to touch the camera once it was set up.

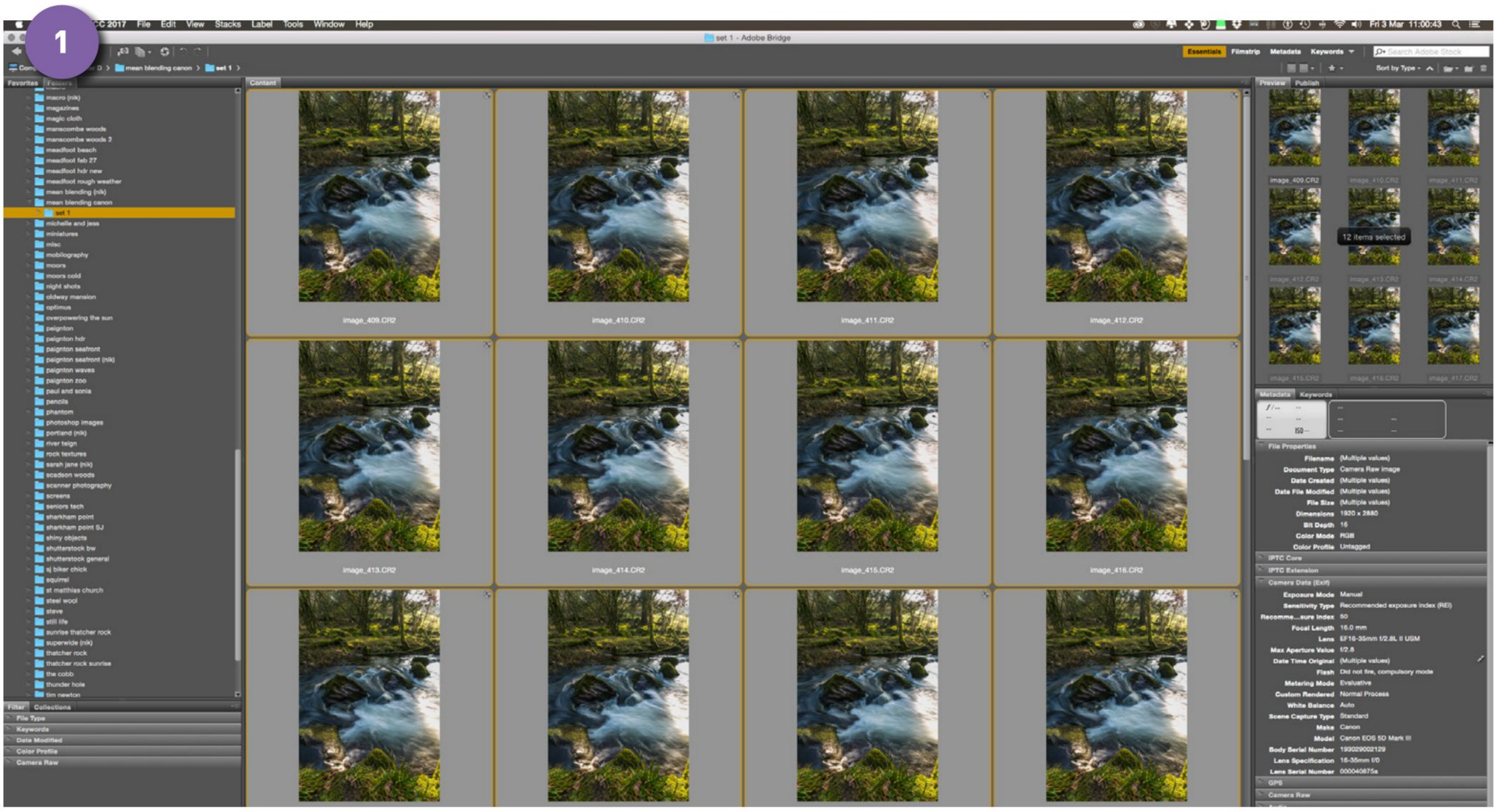
Set up the camera

It's a good idea to shoot in manual mode for both your settings and the focus, as you will require the shots to be consistent. As always, we would recommend shooting in Raw mode if your camera supports it, or at least set your jpeg options to capture in it's highest quality setting. The next port of call will be to stop your lens down to its narrowest aperture. As a general rule, lenses can go down to f/22 or even f/32. This tiny aperture limits the amount of light hitting the sensor, driving up the duration of the exposure. So far so good. Next, you'll need to set your ISO sensitivity to its lowest setting. This is usually 100 ISO, although some cameras can go down to ISO 50. In the case of our example, we could set an aperture of f/22, a shutter speed of 0.5 sec and ISO 50. A test shot revealed that the shutter speed was giving us a good exposure and just enough duration to begin to blur the fast-flowing water of the stream. Since we didn't have any other means to slow the shutter speed any further, we had reached the limit. Apart from the weather conditions changing to an overcast sky and bringing the ambient daylight levels down, this is what we had to work with.

BEFORE

AFTER





The trick is revealed

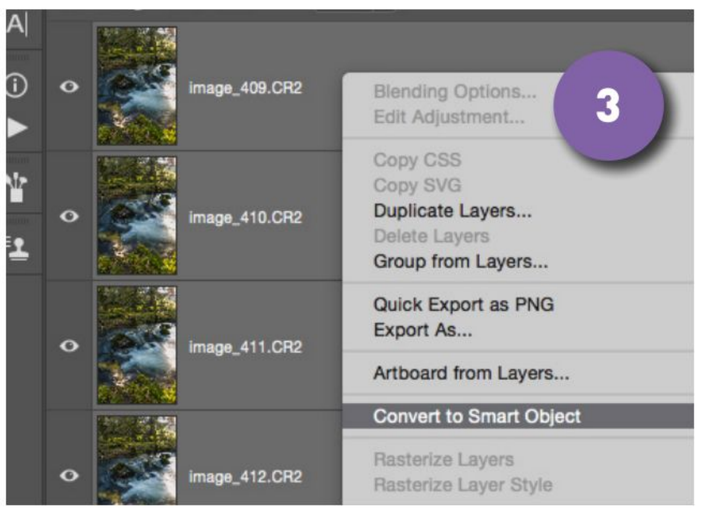
With your camera settings dialled in, your lens manually focused on your point of interest and your cable release attached, the final thing to do is to set your camera's drive, or release mode, to Continuous High Speed. This means that if you were to press the shutter button and hold it down, it would continuously take shots until you either took your finger off the shutter button or cable release button, or the camera's image buffer was full. This image sequence capture is key to the success of the 'illusion' of a long exposure. You'll need to capture at least 6 or preferably 12 images in as rapid succession as you can. Given that in this case, our shutter speed was 0.5 sec, we could capture a number of frames every 0.5 sec, which is obviously well within its 6 frames per second high speed shooting capability. In essence, you have just captured a 12-frame time-lapse of the water flowing by **[1]**.

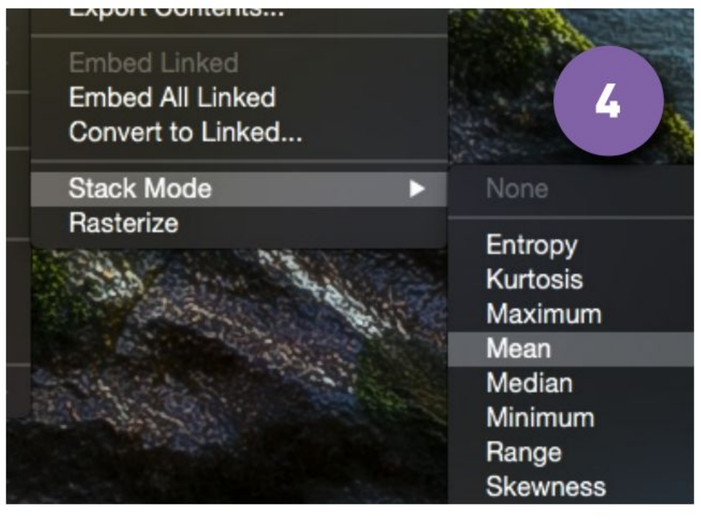
Completing the illusion

Once you have your sequence of images, it is a case of processing them in your favourite Raw editing program. We used Adobe Camera Raw (ACR) to process the shots all at the same time for consistency. Those 12 shots were then opened in Photoshop and all 12 images were stacked in a single Photoshop document **[2]**. It is worth noting that you will be dealing with large file sizes, so if your computer doesn't have much processing power and memory, you might want to save your images out as smaller jpeg files before proceeding. Since we had used a tripod when capturing our sequence, we didn't have to worry about aligning them. Then it was a case of combining all 12 images into one single Smart Object **[3]**, which allows non-destructive adjustments to be made without destroying the original images. Then comes the magic. Photoshop has a method of blending multiple images using something called Mean Blending **[4]**. All this does is compare all the images it is being asked to blend, and arrive at an average based on all the pixel data present and what the differences are between each image. The upshot of this is that your flowing water in each shot will be averaged across 12 images. The result will be a much smoother result that is in effect a 0.5 sec image that now looks like a pseudo 6 sec image because of all the blended images of the flowing water. If no-one knew the process involved, they would be none the wiser to the sleight of hand that had been used here.

More testing

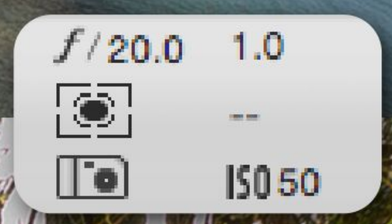
So we had a successful result with a set of 0.5 sec images using a tripod. We were curious if you could push the technique a little more. So we set ourselves the task of capturing an image sequence at higher shutter speeds without the aid of a tripod. Since flowing water reduced to mist is quite an iconic look, we decided we would try and see what we could capture handheld that could approach these popular images. Our main constraint here, was the requirement for shutter speeds that could allow the taking of photos hand held. Our Canon 5DMK3 was pressed into service again with its 24-105mm lens which has image stabilisation capabilities. This gave us the option to shoot slightly slower shutter speeds and still avoid camera shake.





Even if you are actually getting shutter speeds slow enough to give you images with enough motion blur, shooting a sequence of these and blending them can give even more intense results.

BEFORE



AFTER

BEFORE

Our testing took us to the beach where the surf was rolling in on a fairly blustery day against the barnacle encrusted legs of Paignton Pier. Using the same idea as the shots taken at the stream, we stopped down the lens to f/16 and once the ISO was set at 50, we had a shutter speed of 1/50 of a second. A test shot showed that with the image stabilisation of the lens turned on, and by holding the camera in as a rigid a pose as possible, shake-free images were no problem whilst shooting at a focal length of about 75mm. Once again, the camera was set to High Speed Continuous shooting and a burst of about 12 images were shot at 6 frames per second. These were combined in Photoshop and because we shot these hand held, the option to Auto-Align all the images was used to make sure they matched up. We were pleased to note that the effect had actually worked reasonably well, converting a set of images shot at 1/50 of a second into a pseudo 1/4 second shot. The different position of the waves in each successive shot, once averaged, was just enough to create the illusion of a single long exposure. If you had been able to capture more images in the sequence, you could create an even mistier water effect, but it does come down to what shooting and write speeds your camera and memory card are capable of.

More neat tricks

So we've covered how to shoot images that can look like long exposures even without the aid of a ND filter using multiple images and the magic of Mean Blending in Photoshop. However, it doesn't stop there, Mean Blending can also help you out in other shooting situations. Read on as we cover two more great ideas. ■

Shoot in low light without a tripod

Get more confident shooting in low light without a tripod at very high ISO and lose all that noise

Now that you've got the hang of how to shoot images and create an illusion of a long exposure by combining them in a special way in Photoshop, we can also show you more techniques that will benefit you if you find yourself stuck in a particular photographic quandary. Let's outline another situation that you're likely to encounter at some point.

This main image was shot at ISO 3200. It should be very noisy because of the high sensitivity used. However, using a great little technique, you can shoot low light without a tripod, with high ISO and be able to drastically reduce the noise without having to use noise reduction software.

Shooting hand held in low light conditions at very high ISO settings can result in some poor quality images. Photos taken at ISO 3200 on a seven year old camera, for instance, will have all the telltale noise you would expect as seen in the 'before' image. The 'after' image is exactly the same, shot at the same time, with the same camera and settings. So how is it that much cleaner? Read on and all will be revealed.

No tripod

You are traveling home, it is dusk and you happen to see a lovely scene that you just can't pass up and need to take a photo. The problem is, you don't have your tripod with you. You know it's possible to shoot high ISO sensitivity to get faster shutter speeds and eliminate camera shake but the idea of shooting any landscape way beyond 400 ISO seems like a waste of time.

The noise created at higher ISO, even on current cameras, can be a deal breaker that just stops you from getting the shot. Well, there is a technique that can allow you to shoot hand-held at high ISO and eliminate a great deal of noise into the bargain. Okay, we know it's no substitute for using a tripod and low ISO settings but now and again, when your back is to the wall and you have a shot you simply must capture, you have an option.

Tripod trouble

As mentioned, you want to photograph a low-light scene and you have no tripod. The idea of shooting very high ISO to give you the faster shutter speeds you need to avoid camera shake is putting you off. You're all too aware of the image noise that will be present in the shots. Well, you have some options. If you can rest your camera on something solid to help stabilise it, then of course, that's the best solution to keeping the ISO settings as low as possible. If you don't have that option, then hand held is the only way to go.

Good posture helps

Before we start shooting, let's talk a little about posture. You might wonder why, but knowing the correct way to hold a camera can make quite a lot of difference to the resulting photographs. If you're holding the camera in a horizontal orientation, the key is to make sure both your elbows are tucked in tight to your chest. These solid points of contact will help stabilise the camera, particularly if you also press the viewfinder firmly against your face and cheek. This creates a triangle shape that is more stable than just holding your arms away from your body so your elbows are dangling in thin air in front of you. Some people also find that the greater the weight of the camera, the steadier they can hold it. A camera that is too light offers no resistance for your arms to work against and you may find that you are more shaky because of it.

The other way up

If you're shooting with the camera in a portrait orientation, this introduces a certain level of instability as you will have to raise your right arm up to be able to hold the camera grip correctly now that it is rotated 90°; and also be able to press the shutter release button now it is facing upwards. In this situation, you can still keep your left elbow tucked into your chest but it is the least stable position. Some people have been known to rotate the camera in the opposite direction so that the shutter release button is facing downwards. Whilst this does mean you can keep both elbows tucked into your body, some can find this way around pretty awkward as both your hands are now in very close proximity and it will feel more like you are balancing the weight of the camera on the thumb and forefinger of your right hand.

Get a grip

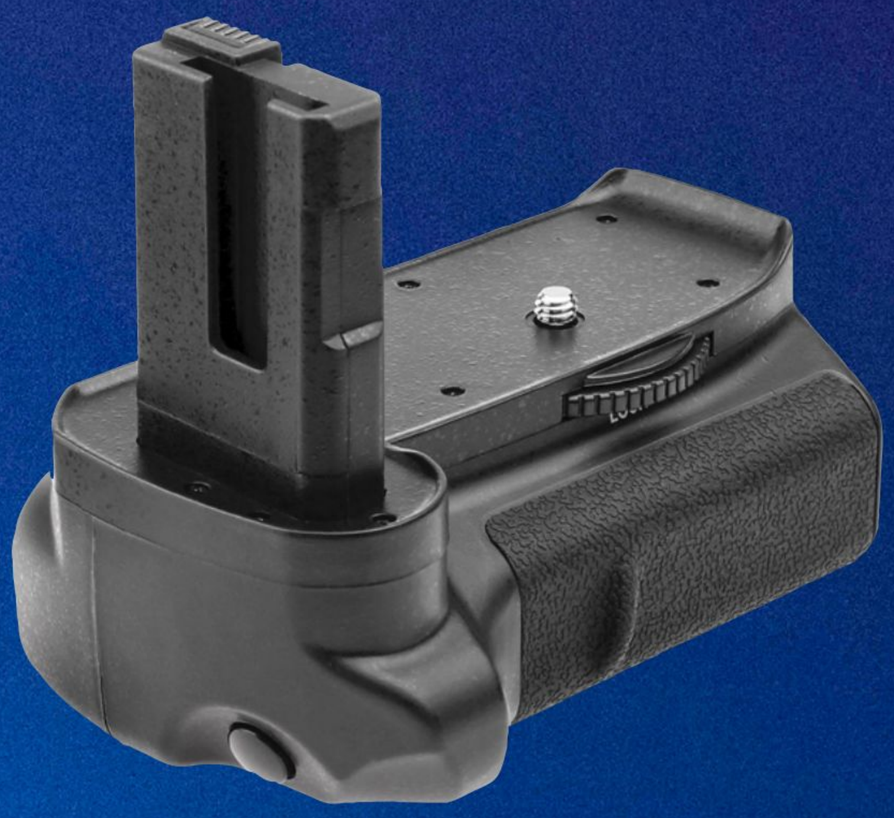
An alternative to the portrait orientation dilemma, is to get a battery grip for your camera. This is essentially a device that is coupled to the bottom of your camera that can hold two batteries and extend your shooting time. The great thing is that battery grips have an extra set of shutter release and function dials built in. This means that you can actually have the camera in portrait orientation but hold it as if it were still in horizontal orientation because the position of the second set of buttons means that you're not having to reach up and over the camera. Now whilst it's true that the main camera manufacturers make battery grips for their range of cameras, they are not exactly cheap. A battery grip for something like a Canon 5DMK3 can run to about £250. That said, there are third-party battery grips available for under £40. They may not be built to the same high standards as their original counterparts but some of them are well worth the money.

Holding your elbows out away from your body will not be a very stable setup. There is the possibility of too much movement because your arms are not anchored.

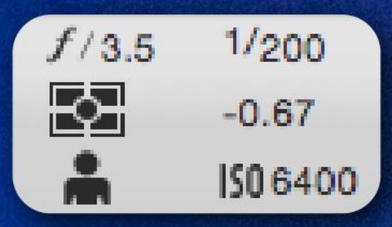
With the camera in horizontal orientation, the best way to hold it is with your elbows tucked in to your chest to create a stable configuration that can help reduce camera shake.

In portrait orientation, without a battery grip, you will have to reach up and over the grip to press the shutter release button. Your right arm is not anchored to your body, but you can still keep your left arm pushed against your chest.

Having the camera the other way up so the shutter button faces down is a possible method. It does mean both elbows can stay pushed against your chest but it can be rather fiddly having both hands in such close proximity.



The battery grip is very handy for extending your shooting time, by holding two batteries; and it has a set of shutter release and control dials that mean you can shoot with the camera in portrait orientation but hold it as if it were still horizontal.



Before you shoot

Now that you've got the posture sorted out, you need to get the camera settings organised. Bear in mind that if your camera supports image stabilisation, either built into the camera or the lens, then make sure it is switched on. Any advantage is useful here. Modern image stabilised camera and lenses can give you a 3-5 stop advantage. This means an image that would normally require a shutter speed of 1/10 of a second, can effectively be stabilised as if it were more like 1/80 - 1/320 of a second. This gives you the option to use longer shutter speeds than you might at first think to be viable for a steady shot. Next, depending on the lens you're using, you need to open up the aperture to its maximum setting. A lot of zoom lenses normally have a maximum aperture of around f/3.6 - f/5.6. More expensive lenses offer f/2.8 as their widest aperture which lets in 2-stops more light than an aperture of f/5.6 for instance. Fixed focal length lenses, or prime lenses as they are known, can offer apertures as wide as f/1.4 or f/1.2. An f/1.4 prime lens would be 4-stops faster than an f/5.6 lens. Often referred to as 'fast glass', the fastest primes tend to be around the 50mm - 85mm focal length area. Not quite so good if you're looking to shoot a wide landscape. There is also the often quoted 'shutter speed as inverse of focal length' rule. Simply put, this states that if you are shooting with a focal length equivalent in full-frame terms to 50mm for example, then your shutter speed should be at least 1/50 of a second. More a guide than a rule, you'd be better served to always try and shoot as far above this as possible. With todays larger sensors, our example 50mm focal length would be better off if it were shot at 1/100 of a second to yield crisper results.

The very affordable Canon EF50mm f/1.4 (above left) is a fast piece of glass but may not be an optimum lens for shooting a landscape. As with the Nikkor AF-S 35mm f/1.8 (above) which is roughly equivalent to a 50mm full-frame lens.

The very wide angle lenses like the Sigma 10-20mm f/3.5 shown opposite, which is equivalent to the EF16-35mm f/2.8 full frame lens pictured below, are great choices for landscape shots. Although not image stabilised, their short focal lengths allow for longer shutter speeds before camera shake becomes too apparent.

What is image stabilisation?

Image Stabilisation (IS) is a method used in digital still photography and videography to reduce blur caused by the unwanted movement of the camera. In stills photography, once the shutter speed gets below the reciprocal of the focal length of the lens (i.e. 100mm focal length requires shutter speed of 1/100), the chances of camera shake spoiling the image increases dramatically. Image stabilisation can steady the image by using either lens-based stabilisation or sensor-based stabilisation. Elements within the lens or sensor actively move to counter the detected movement of the camera. These methods can give an apparent 3-5 stops advantage.

The 24-105mm f/4 IS zoom lens is a good all round lens. Although not as wide as the lenses above and a maximum aperture of f/4, it is still serviceable for most conditions. The addition of image stabilisation is a bonus for low light shooting.

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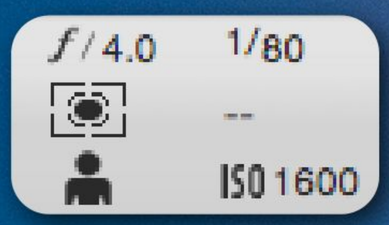
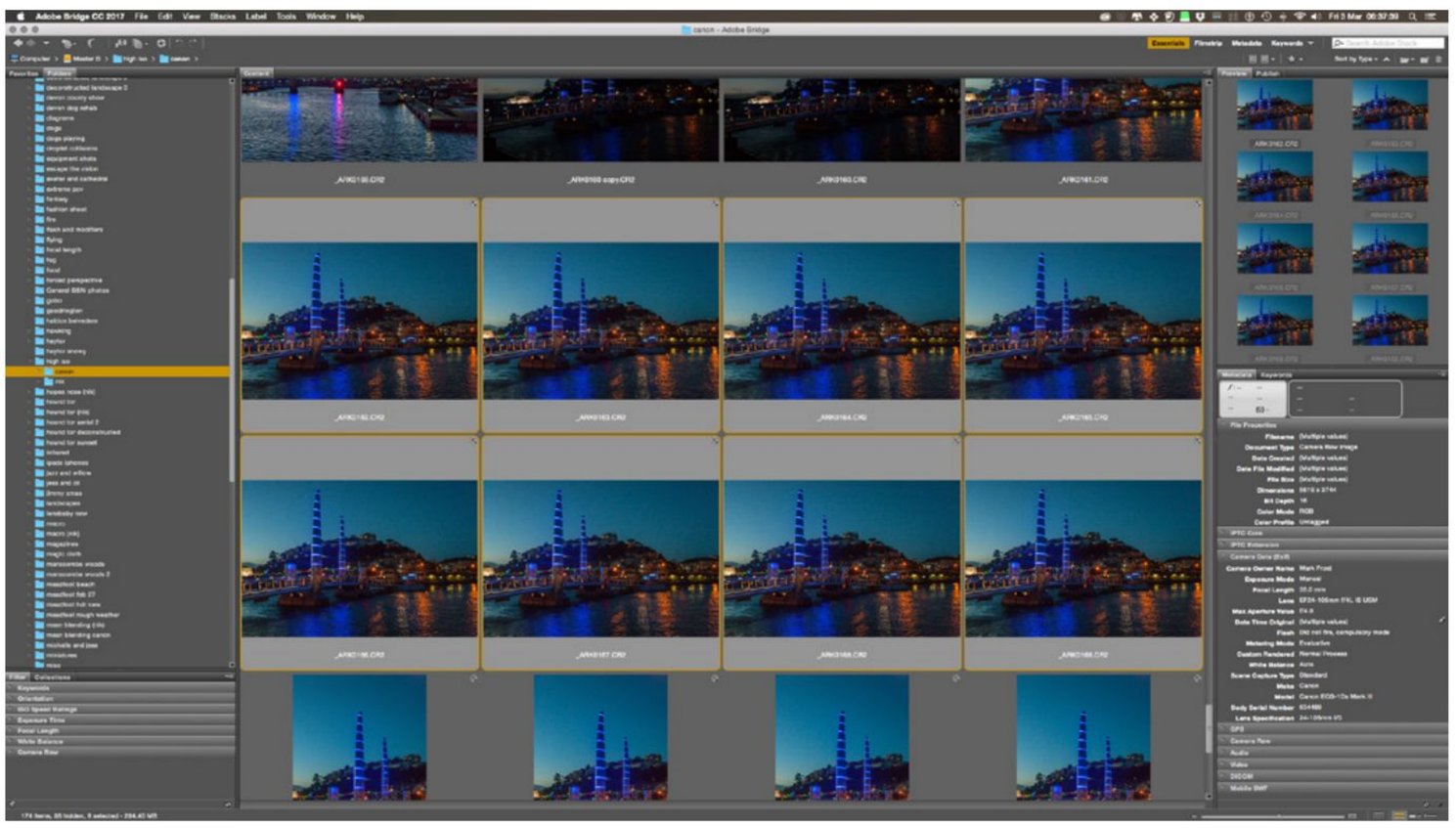
f/5.6 1/320
-0.67
ISO 6400

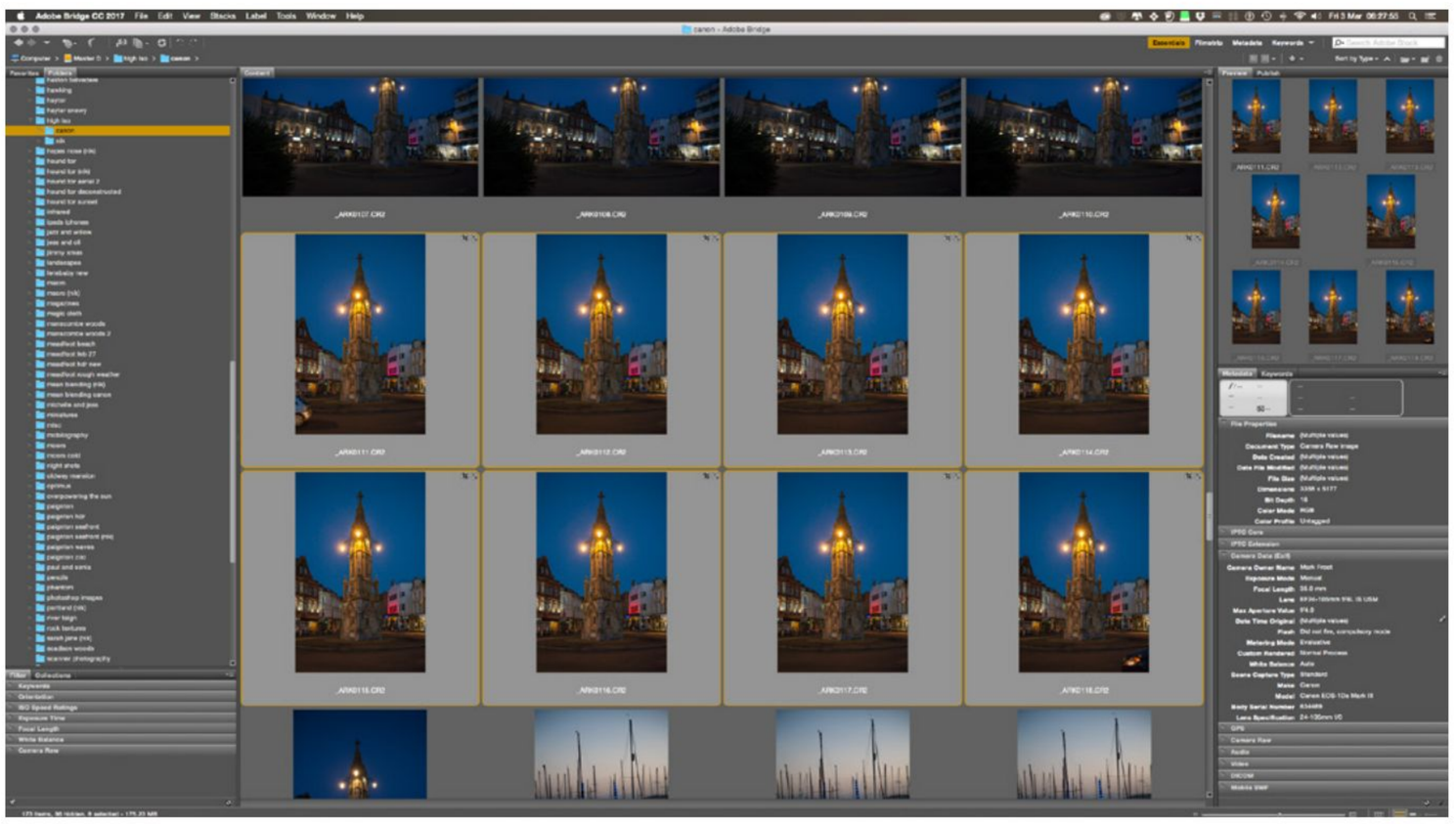
BEFORE
AFTER


f/4.0
1/80
--
ISO 1600

Canon
EOS-1
Ds
Mark III

CANON ZOOM LENS EF 24-105mm 1:4 IS USM
24-105mm
24 35 50 70 105
IMAGE STABILIZER





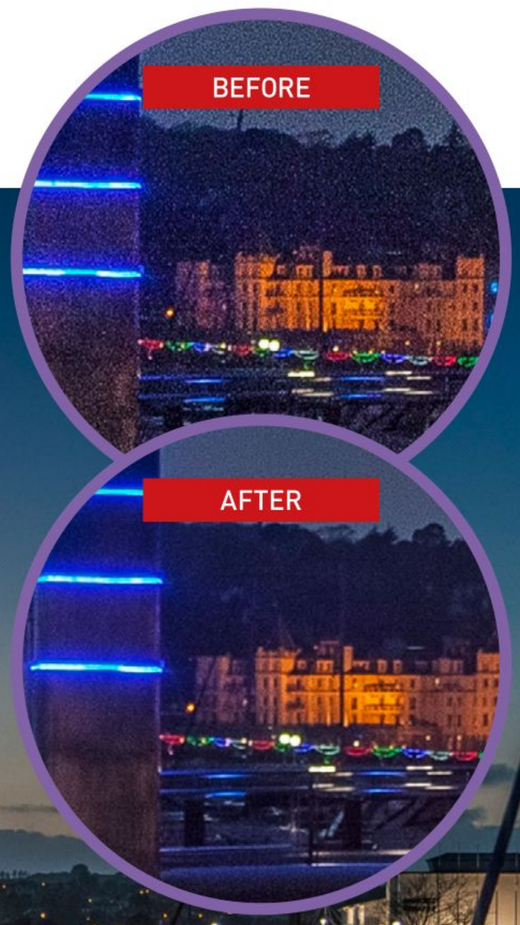
An image sequence

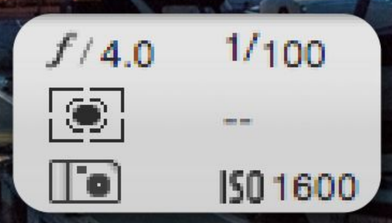
Just like the long exposure trick, a sequence of at least 6 identical images will be required. You can't shoot one and copy it a number of times in Photoshop as that won't work. The multiple images are the key to eliminating as much noise from the final shot as possible. Our camera was set to Continuous High Speed shooting mode which meant we could capture a sequence at up to 6 frames per second. The shutter speed will ultimately dictate how fast you can shoot the sequence but taking it in as short a time as possible will help.

Something to bear in mind

If you are using image stabilisation, there is one thing to bear in mind that can be overlooked. Although the image is stabilised to steady shots taken with slower shutter speeds than normal, that doesn't mean that any objects moving within the shot are frozen in place. If you're photographing a scene that has people or cars moving through the frame, they will appear blurred because the slow shutter speed dictates it. The stabilisation applied only has the illusion of increasing your shutter speed, if it was 1/10 of a second before, it will still record any movement for that duration.

To achieve a shot that was shake free and as low in noise as possible, a careful mix of aperture, ISO and shutter speed was needed to give the final shots a fighting chance of being the best quality.



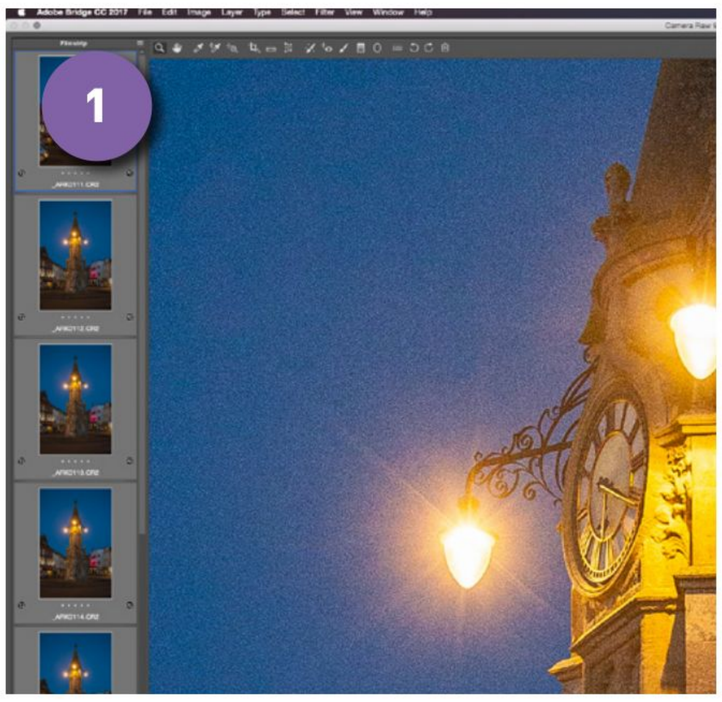


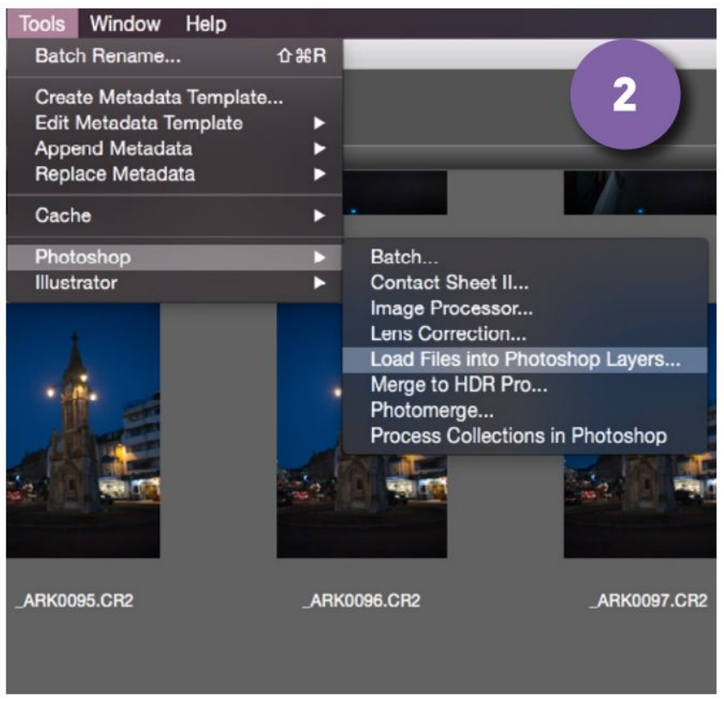
Taking the shots

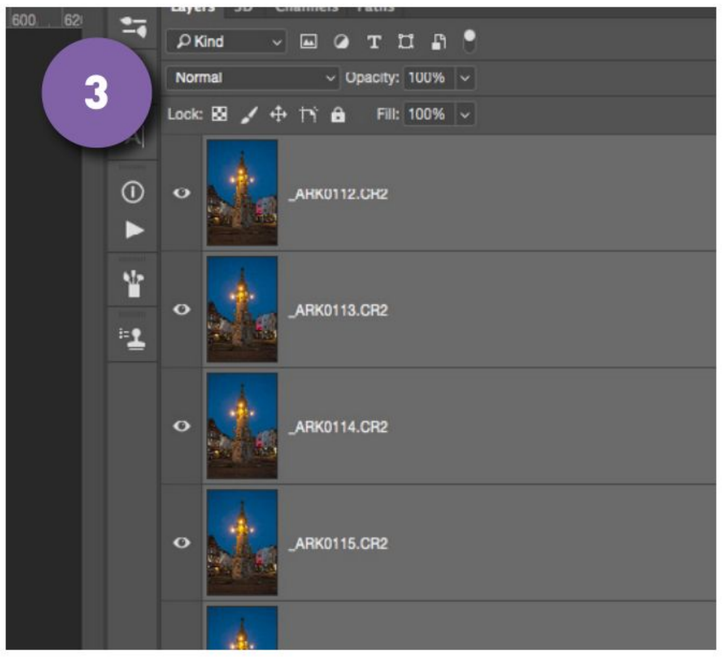
Our examples were taken with a Canon 1DSMK3 and a 24-105mm f/4 image stabilised lens and also a Nikon D5500 and Sigma 10-20mm f/3.5 non-stabilised wide angle lens. We focused roughly one third of the way into the shots to try to maximise depth of field and made sure the cameras were shooting in Raw format. On the Canon we were getting shutter speeds that varied between 1/40 of a second up to about 1/100 with an aperture of f/4, that was the widest available on the lens, and trying an ISO of 1600 and 3200 that was its maximum. For the Nikon, we pushed things a little more and used an ISO of 6400. We fired off test shots to check exposure and used the camera's LCD screen to view the shot at a large magnification to check for camera shake. All was well, so we set up our various compositions and fired off sequences of 6-8 images just like the previous long exposure technique, taking multiple images of the same scene. Since you're shooting a number of image sequences, it's a good idea to shoot one blank frame between each set of shots, just so you know where each one ends and the other begins, when you're reviewing them later. Once we were happy that we had a good set of captures, it was time to get back home and view them on the computer and start the next stage of the process.

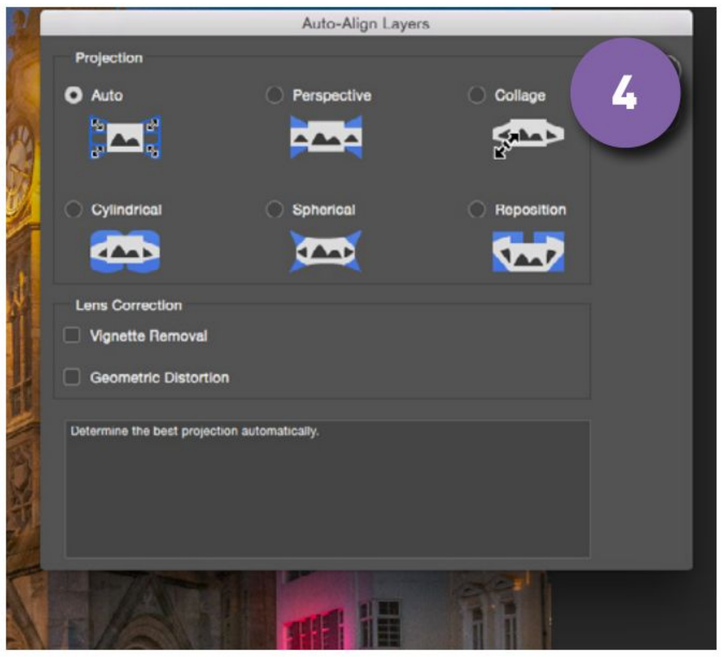
Processing

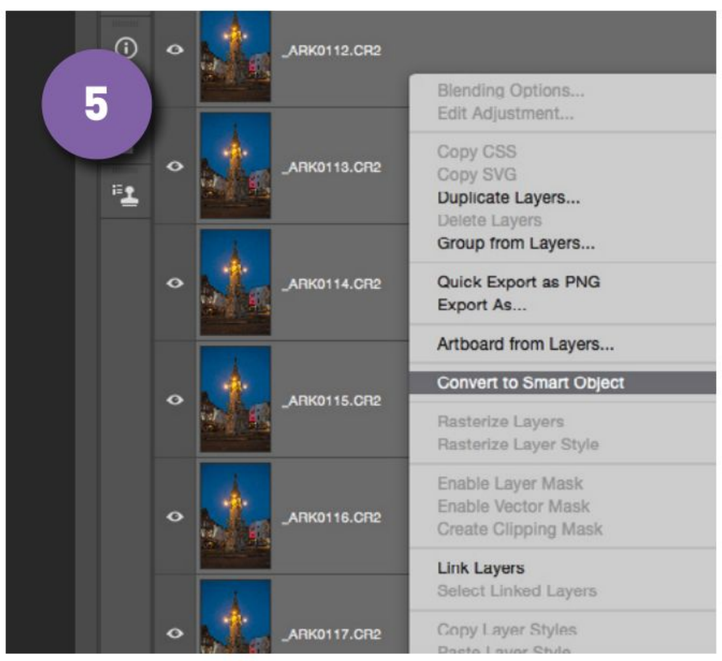
Back at the computer, we picked out our favourite sequence and opened the shots in Adobe Camera Raw (ACR). How you process your shots is down to personal taste but the key is make sure they are all selected so any adjustments are made to all the shots [1]. Things like lens correction particularly should be applied to all the shots otherwise they won't align in the next part of the process; also, try not to overdo the amount of shadow detail you try to reveal. The shots are high ISO and therefore carry a lot of noise, particularly in shadow areas. The more you push the exposure, the more prominent the noise will become. The image sequence was then opened in Photoshop [2] and stacked together as multiple layers in one document[3]. In this case, because the shots were hand held, the layers were all selected and aligned using Photoshop's Auto-Align feature [4]. Once they were matched up, all the layers were combined into one Smart Object to allow non-destructive adjustment and editing to be performed [5]. Then the Mean Blending option was used. This analyses all the shots and averages out the pixel data [6]. Because each image contains a certain amount of noise, and that noise is different from shot to shot, once it is averaged out, the amount of visible noise is dramatically reduced. You can of course use the noise reduction option in Photoshop. Here is a direct comparison between the blended version [7] and the one with noise reduction applied in Photoshop [8]. Notice that the blended sequence of shots is much more crisp than the default noise reduction used in Photoshop.

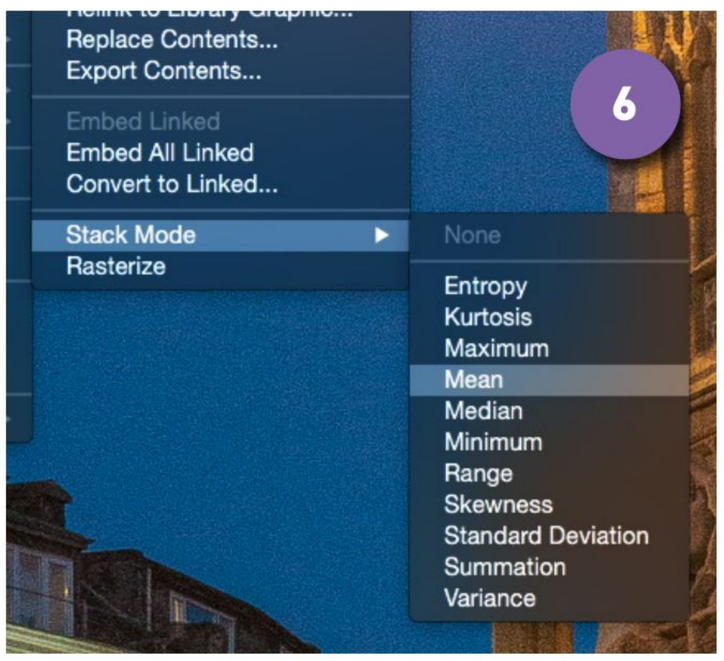


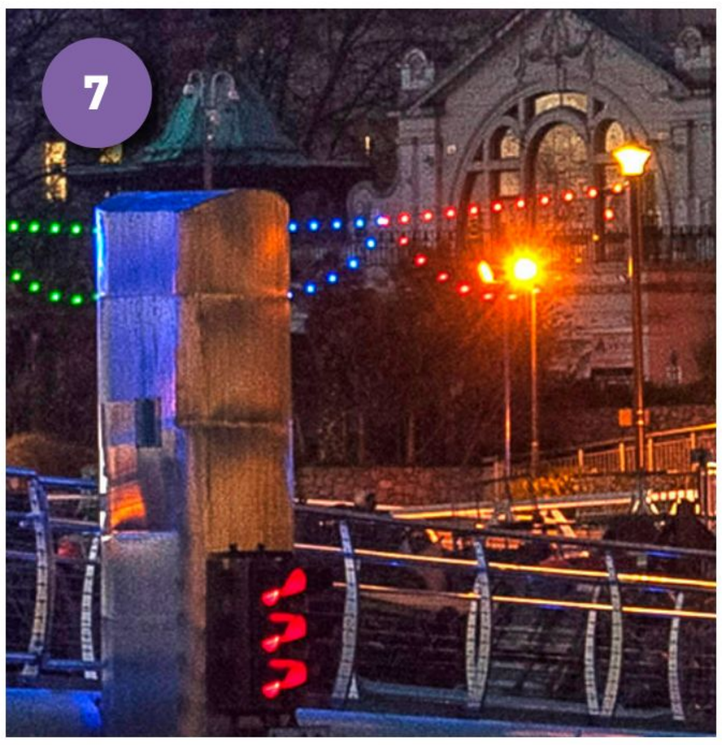


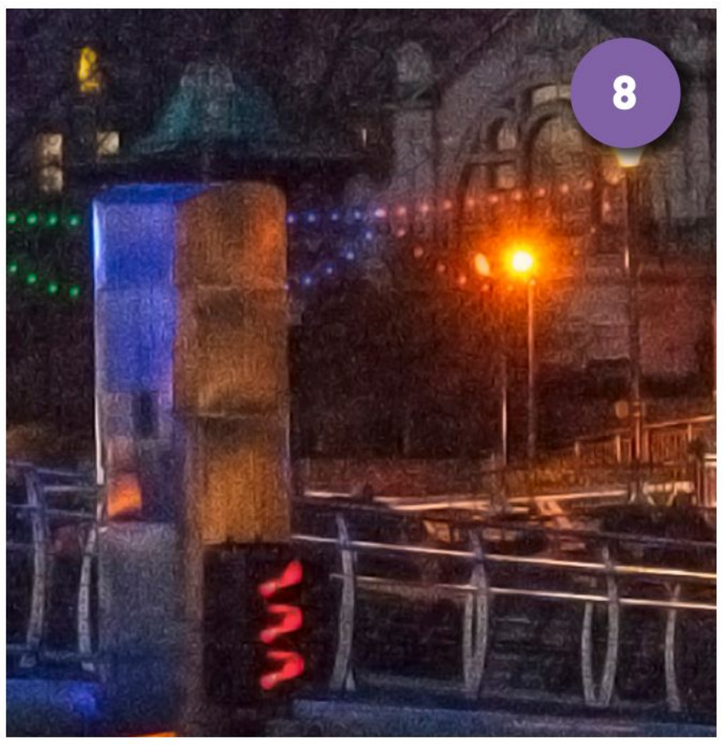






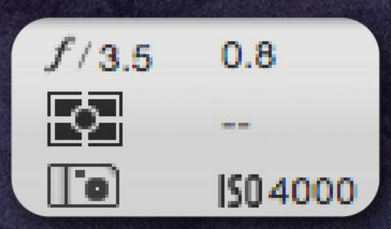






> "They were processed and stacked in Photoshop and converted to a Smart Object. Once the Mean Blending option was applied, it did improve the image."

A sequence of 6 lighthouse shots were considered too underexposed to be any good. Coupled with the noise at ISO 4000, they almost went in the bin. They do however, provide a good, albeit extreme, example of the Mean blend method.



Extreme example

It was such a great little trick, we wondered how far you could push it. We remembered that we had a sequence of images of a light house that we shot a little while ago. They were shot on a Nikon D5500 at ISO 4000 and to be honest, they were so underexposed and noisy when processed that they were almost consigned to the trash. However, we'd kept them so we thought it would be quite an extreme test to see how the technique worked on them. They were processed and stacked in Photoshop and converted to a Smart Object. Once the Mean Blending option was applied, it did improve the image. We can't claim it now looked like an ISO 50 shot but, at certain sizes, it would be quite usable.

One more to go

So, we've covered long exposure effects and high ISO hand held photography. We have one more coming up next that is a really great solution to a common problem. ■

The stand-in safari

A trip to the zoo can help sharpen your photography skills

The excitement of photographing wildlife in its natural habit on the plains of Africa, or in the Congo basin is beyond all but the most intrepid and experienced wildlife photographers. The images captured can be breathtaking and unlock the wonders of natural world when presented to us on the covers of prestigious magazines such as National Geographic. Experience, funding, and some very specialist equipment is the order of the day for the top-level wildlife photographer.

How about the rest of us would-be wildlife photographers? How is it possible to begin to develop the skills required when Lions and Elephants aren't exactly thick on the ground in the streets of your local town? An excellent place to start, is at your local zoo. Agreed, it's not exactly the wilds of Borneo, but there will be a range of exotic creatures big and small that you can try your photographic skills out on.

The animals

If you think about it, the Zoo is a great place to practice. It is a safe environment, and the animals are easily accessible. Obviously some animals, such as the primates, can only be viewed from a distance. In some cases, all that separates you from a Cheetah, for instance, could be a single sheet of clear polycarbonate. However, in other cases, certain animals can actually be petted or fed directly, which gives you choices for some interesting close-up work too. Also, if the animals aren't presenting themselves for the camera, there is also that most entertaining creature, the human being.

The challenge

The zoo environment creates challenges that are not vastly different to capturing animals in the wild. You may have to shoot your subject from a distance. They may present a moving target and may be moving from a well-lit open area to more densely foliated areas. The rules of composition are still in effect, as is general photographic technique to ensure sharp, blur-free shots. There is also the additional challenge of the zoo itself. You will be shooting through cages or from behind glass and plastic, and you'll have to bear this in mind when composing your shots to make them look as natural as possible.

For our 'safari' we went to Paignton Zoo in Devon. We tried to keep our gear choice fairly minimal. We had an old 18MP Canon EOS 550D to which we attached a 100-400mm EF f/4 lens for an effective focal length of 160-640mm to give us a little more reach for shooting distant subjects. For the indoor low light enclosures such as the reptile house, we went with a Canon EOS 5DMK2 and a 100mm macro lens with a maximum aperture of f/2.8. This meant we could attempt to capture some nice close-ups of the creatures in their display cases. We would still have to shoot high ISO images but the wide aperture of f/2.8 gave us a fighting chance of getting some decent images at reasonable shutter speeds. We also had a sturdy tripod if needed for when slower shutter speeds no longer enabled hand held shooting. We also had a 24-105mm f/4 lens that we didn't use in the end. Topping it off was a good camera bag that could be slung over the shoulder and was not too intrusive while walking about.

1

2

3

4

The equipment

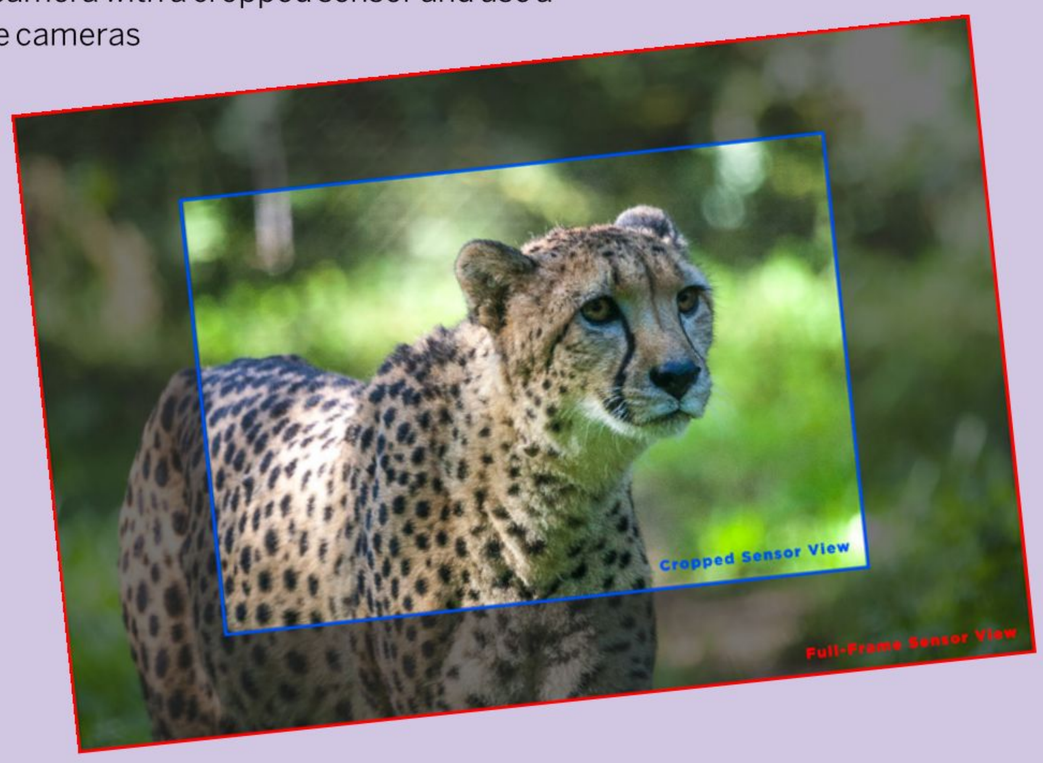
You are planning a trip to the zoo. What should your gear choices be? This will depend on your shooting style, but in the same way a landscape photographer will always have a wide-angle lens in their bag, a wildlife photographer will have a zoom lens. It doesn't mean you have to go out and spend thousands on a dedicated super-telephoto lens such as the Canon EF 800mm f/5.6 at nearly £10,000 **[1]**. You can actually buy a Korean super-telephoto 650-1300mm f/8-f/16 lens for £150 **[2]**. You would have to be aware though, that at this price-point, it is not going to be exactly world-class quality. Happily, there are other options. The current crop of super-zoom digital cameras are very affordable and offer optical zoom in the order of 30x to 80x magnification. The Nikon COOLPIX P900 **[3]** has a 16MP sensor and a massive 83x magnification, which is comparable to a full frame camera with a 24-2000mm lens. If you don't have a super-telephoto, you can always choose to crop your shots in your image editing software. The higher the resolution of your sensor, the more cropping power you'll have.

Double up

If you already have a DSLR with a medium telephoto in the 70-300mm length range, you could buy a focal length extender **[4]** and double the lens to 140-600mm. The big names like

The crop factor

Another option is to use a camera with a cropped sensor and use a lens designed for full frame cameras on it instead. As an example, for some of the shots used in this article, a Canon EOS 550D was used with a Canon EF 100-400mm f/4 zoom lens. The lens is designed to project an image onto a sensor 1.6x larger than the one used in the 550D. The actual focal length of the lens does not change but the 100-400mm focal length range on the lens now appears as if it were 160-640mm.



Canon and Nikon offer these extenders for around £350, but you could always opt for third party brands like Yongnuo at up to half the price.

Get close

Now we have some options for shooting at long range. What about close-up? If you have a macro lens or your camera has a macro setting, then remember places like the reptile house or butterfly enclosure might allow you to get some interesting macro shots. In both cases, whether shooting at long focal lengths outdoors or shooting macro indoors with low light conditions, a tripod will be essential to keep your images free from motion blur. Be aware when moving indoors to a simulated tropical environment from a cold outdoor setting, that you risk your camera and lens fogging up when the cold metal and plastic of your gear hits the humid air of the much warmer enclosure.

When cold camera equipment meets warm humid air, the result is fogging of the lens and viewfinder and the chance of condensation build-up on your gear. If you can, make the transition between the two as gradual as possible. Some photographers have been known to put a cold camera or lens under their own coat in an attempt to warm it up a little before going into a humid environment.

Scout around

When you arrive at the zoo, it's generally a nice idea to walk around first and figure out where the best shooting angles might be for any given enclosure and when certain animal's feeding times might be. If you have to shoot through cages or bars, are there any apertures big enough to let you put the lens through so you do not capture any distracting zoo hardware in your shots? Failing that, shoot at your widest aperture for shallowest depth of field with the bars close to your lens and capture the animal at a point furthest from you and the cage you are shooting through. With a little luck, the cage will be out of focus enough not to distract too much. If you are shooting through glass, pick a spot where the glass is clean (or give it a wipe) and shoot square on through the glass, even pressing the lens hood against the glass to try and reduce as much unwanted reflection and glare as possible.

Eyes open

When you photograph a person, a key consideration is to get the eyes in focus to connect the viewer to the subject in the shot. That holds true when photographing animals too. Make your focus point the eyes of your subject, or the eye closest to you if they are at an angle. If you are photographing a smaller creature, get down to their eye-level if the conditions and enclosure allow it.

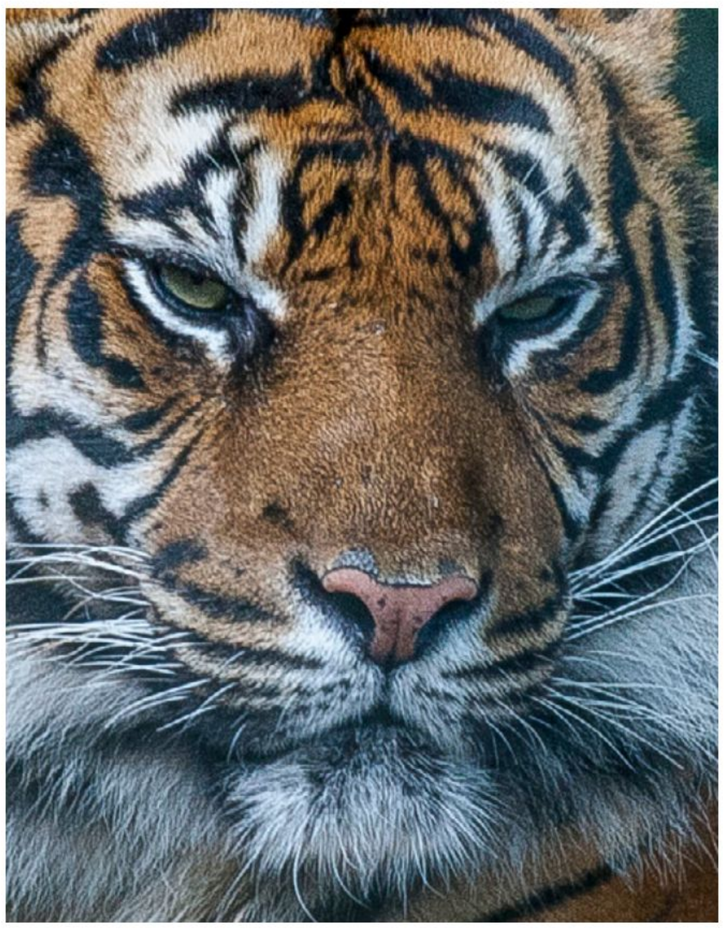
Photographing a pot bellied pig whilst standing up means you only see it from a human perspective. Photograph it from its point of view for a more intimate shot.

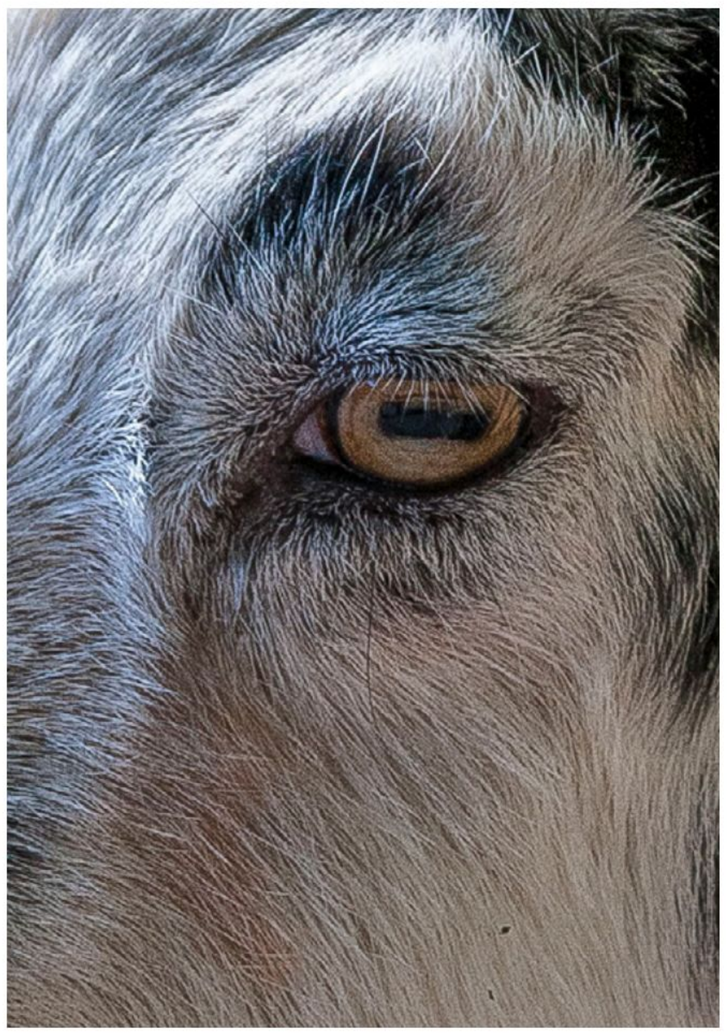
Wait for it

Animals are unpredictable to say the least. The best kind of wildlife photography shows animals displaying behaviour, rather than just sitting immobile. Be prepared to sit and wait, with your eye glued to your viewfinder, for something to happen. It might sound odd, but keep both eyes open whilst looking through the viewfinder. Your peripheral vision in the eye not looking through the viewfinder helps you to spot something that might happen in the wider context and you may 'see' the shot coming. Be on your guard for two baboons to start squabbling or for lion cubs to start play-fighting whilst the lioness looks on. You just never know.

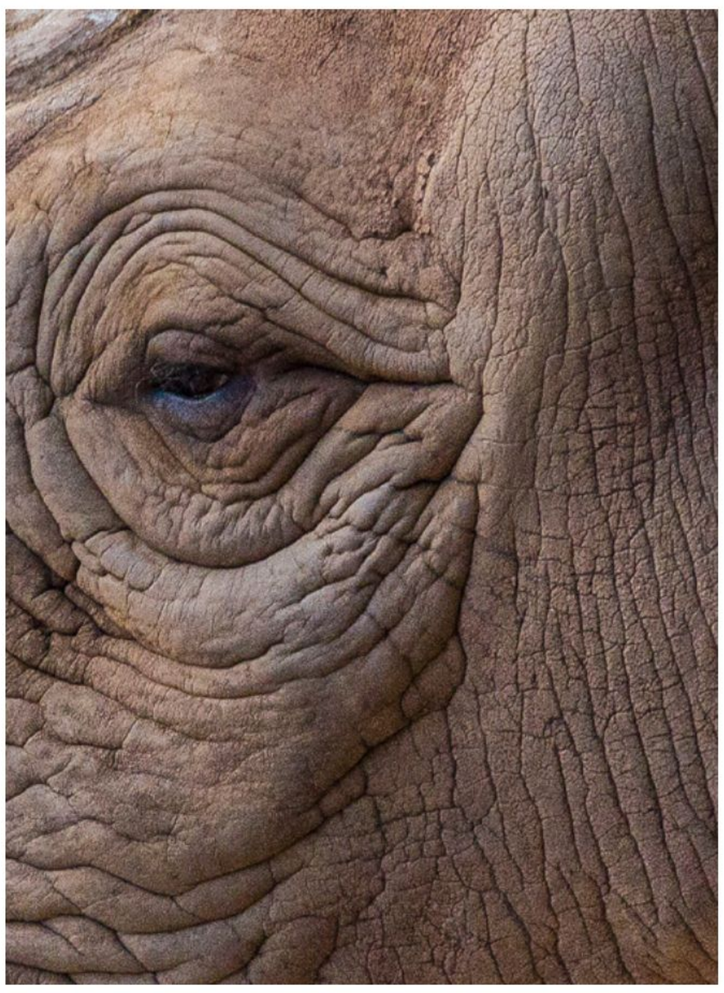
This lion was far too close to the fence to avoid the criss-cross pattern of the wire being visible. In cases like this, why not just make a feature of it? An image like this might have more impact and can be more of a statement.

A tripod can double up as a monopod at a pinch if you are in a tight spot as shown below. Although not as stable, it will help you keep your camera a little more solid as you go for those shots where shutter speeds are too slow to enable you to go hand held.





Sometimes, no matter what angle you shoot from, there may always be some man-made object that gives the zoo environment away. In cases like that, you can also crop images very tight for a more abstract feel to remove as much of those unwanted distractions as possible.



Think fast

Most of your subjects will be moving targets. Keep your shutter speeds high and you'll eliminate camera shake. Shoot in Aperture Priority and dial up your camera ISO setting and keep your aperture at its maximum f/2.8-f/4 if you have it, and try and get your shutter speed to 1/500 or beyond. It's better to have a noisy but sharp image due to high ISO, than a completely unusable blurred image of a chimpanzee leaping from tree to tree. If your camera has a continuous shooting mode, activate it. You can shoot a small sequence of shots and stand a better chance of getting the 'moment' you were after within that sequence.

Lock on

For shooting animals in motion, focusing mode is down to your style of shooting, but a good place to start is with AI Servo mode. This mode allows you to lock an AF point on your subject, and while depressing your shutter button half way down, it will continue to track the subject as long as you keep the AF point on the subject as it moves. It can take a bit of practice, and certain focus tracking systems may not be so sensitive in low light.

Above all else, abide by the rules of the zoo, always be courteous, do not attempt to put yourself or the animals in danger in any way and be mindful of using flash that might startle the animals. Take many shots, memory is cheap, you increase your chances of nabbing a cool shot if you shoot more. Finally... enjoy your day at the zoo. ■

Rural and natural landscapes

Capture the countryside in all its rugged beauty

There is often a misconception among budding photographers that landscape photography is something of an easy option when deciding on a subject to capture. Sometimes it only takes a twenty minute drive to transport you from your local town and put you among the marvels and beauty of the natural world. While it is certainly true that the natural world is very accessible, it can be another thing altogether to create memorable landscape images. It isn't just a case of arriving at a destination, firing up your DSLR and snapping away like a mad thing. The skills you may have that enable you to operate your camera are quite distinct from those that allow you to envision a beautifully composed image within the landscape you currently find yourself. Both are dependent on each other to deliver great landscape images.

> "While it is certainly true that the natural world is very accessible, it can be another thing altogether to create memorable landscape images."

A sense of scale

When you step out into the environment, the first thing worth considering is the scale of the scene you want to capture. Although we have mentioned the wide-angle lens as the primary lens to consider for landscape work, you don't have to stick with accepted rules and it's up to you to challenge yourself and the rulebook. Knowing what to leave out of a photograph, is just as important as what to include.

The broad canvas

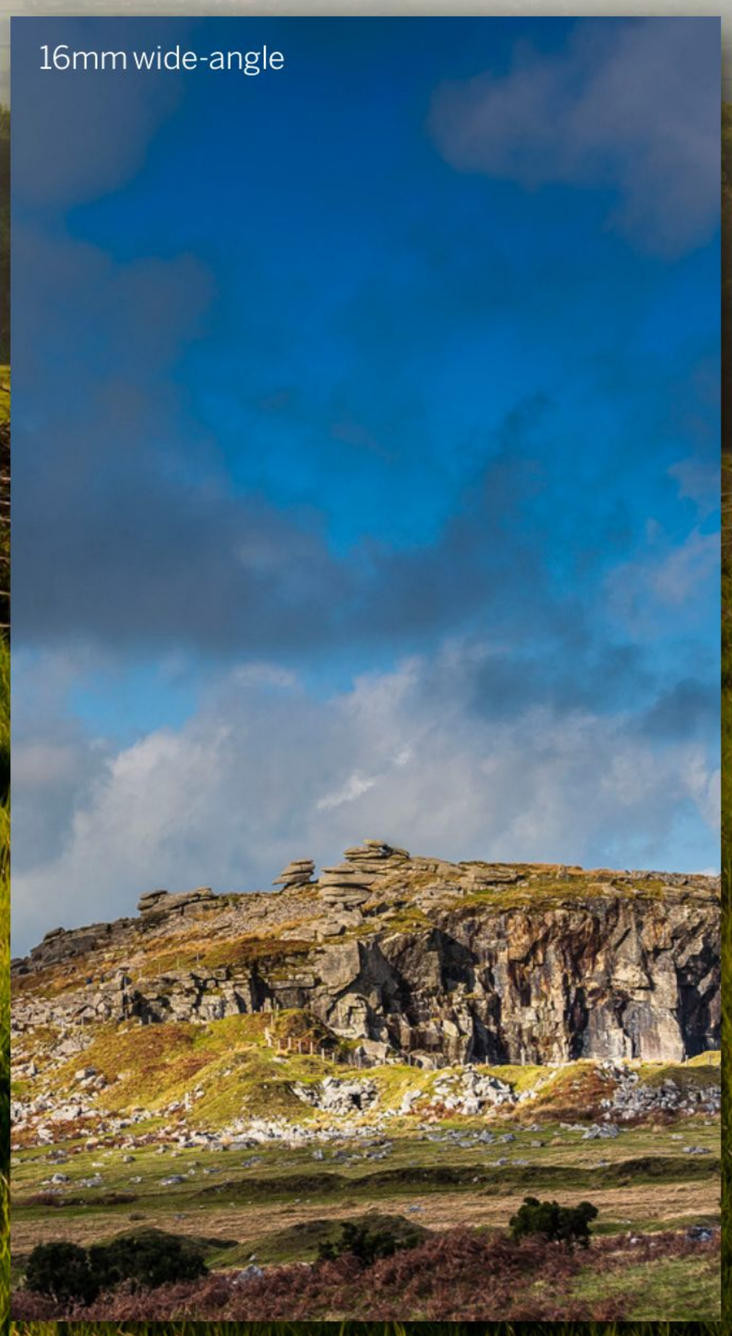
The wide view is the first order of the day for most. Covering a huge expanse in your shot can make for immersive images but be aware that a wide-angle lens will capture a very large field of view that has the effect of making any points of interest look very small in the frame. Also consider that if you have included some foreground interest close to your camera and shoot it at a wide focal length such as 14mm -16mm, it will appear distorted. Wider views are often best captured at either end of the day during the golden hours when the sun is very low on the horizon.

A picture in a picture

Next comes the more intimate landscape. It can actually be an effort of will sometimes to force yourself away from the wider view and consider shooting a more intimate landscape. This is where you zoom in or move closer, to isolate a particular aspect or detail from the whole landscape and show it as if it were a scene within a scene. It may seem counterintuitive but there is a good case to be made for using a telephoto lens in cases like this to pull a particular feature towards the viewer. Although not a rigid rule, diffused or indirect light is often used to capture greater detail because of the lower contrast that diffused light brings.

Up close and personal

At the other end of the scale comes the macro landscape. This is where you deliberately focus very closely on one tiny element of a scene. Often you are drawing attention to something that is too small to be seen by a casual viewer. It can be an interesting challenge to find a tiny detail that in some way echoes the grand vista from which it is derived. Back-lighting or side-lighting can help accentuate objects for a more 3D feel but watch out for strong light coming down at a high angle, creating deep pockets of dense shadow and destroying detail.


16mm wide-angle

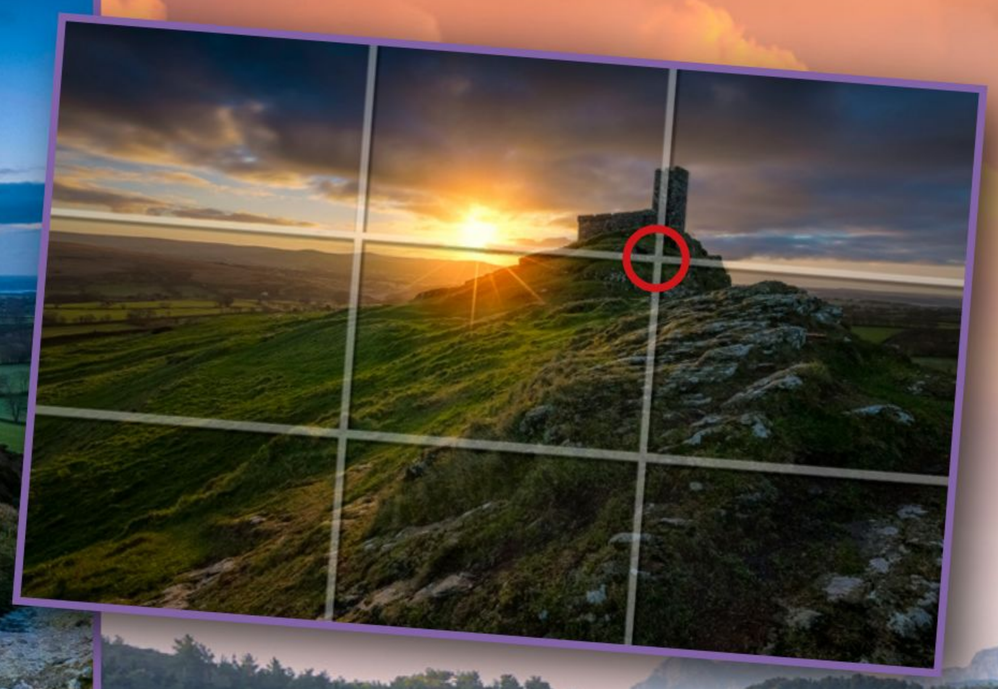
50mm medium-telephoto

You don't always need to capture the widest view possible, even if it seems the likely thing to do. Sometimes a closer, more intimate shot can be effective, even down to the macro level if you should so wish.

100mm macro

(Below) this image of Brentor, near Tavistock, was taken about 15 minutes before sunrise. Compare it to the main image taken a few minutes after sunrise. The tones have transitioned from cool blue and pale yellow/orange hues to much stronger warm orange and yellow tones. The shadows, initially soft in the pre-sunrise image, have given way to much more defined shadows which will continue to become more harsh and deepen as the sun rises higher in the sky.

Rule of Thirds composition technique places a point of interest on one of the lines or intersection points of the grid.



Rules? What rules?

It has become a bit of an overused cliché but the rule about there being no rules, still rings true. Rules can aid you in arriving at a pleasing landscape image but you should always have an idea in your mind about what works for you. The view through your camera's viewfinder should move you in some way, it should speak to you. Even if what it is saying is that you should try another view somewhere else that has more visual impact. At the risk of introducing even more cliché into the mix, here are some inspirational quotes that make a lot of sense.

Edward Weston
"To consult the rules of composition before making a picture is a little like consulting the law of gravitation before going for a walk."

Ansel Adams
"There are no rules for good photographs, there are only good photographs."

The raw materials

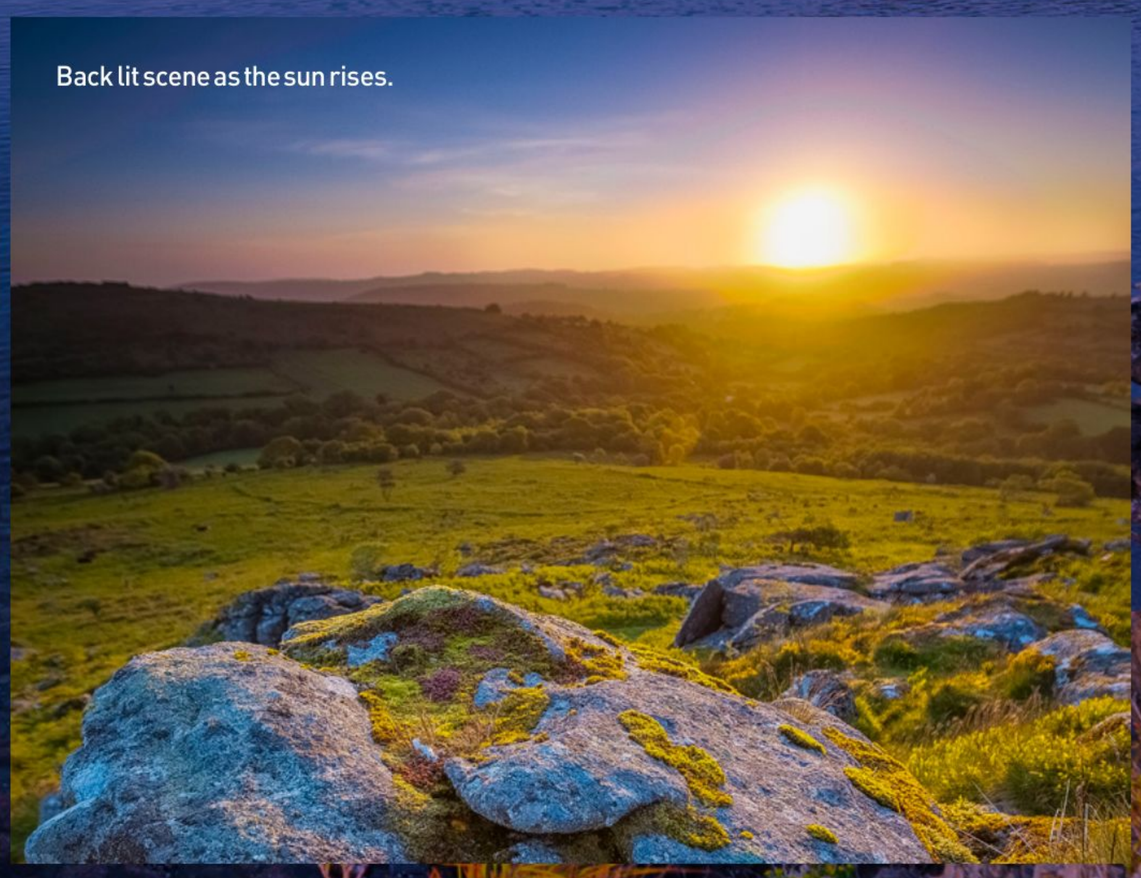
Any landscape image is a collection of visual elements, captured on film or via a sensor and framed accordingly by your choice of lens or cropped during post-work. Take a moment to distil the scene in front of you into its component parts before you take a single shot. Slowing yourself down and taking a more considered approach to your landscape photography will yield results.

Light it up

For a landscape photographer, light is the first and best raw material you have available to you. It will shape and colour the image, so you need to look out for the quality of the light. Knowing where and when the sun sets and rises in a location is a key first step before you embark on a journey into the great outdoors. As we've said before, the golden hours are some of the best times to shoot landscapes, but you need to be aware of how the light changes from a soft, cool, indirect glow when the sun is still below the horizon, to the warm tones and long shadows created as the sun finally appears.

Shapes and form

The light in your scene will naturally have an effect on the shapes and form of objects within it. Surface textures and patterns will be revealed, as well as colour and tonal values. Consider if you want to shoot your scene back-lit, with the sun in front of you, casting shadows in your direction or whether you turn the camera to shoot the scene front-lit with the sun at your back or off to the side.



Back lit scene as the sun rises.

Side lit scene after sunrise.

If you're shooting directly into a sunrise there will come a point, as the sun gets above the horizon, when it will be just too bright to shoot successfully and you run the risk of lens flare and damage to your own eyes by looking at the rising sun for too long. That is a good time to simply rotate your camera by 90° or more away from the sun and shoot your scenes either side lit or front lit.

Framing the shot

Look out for a focal point and apply the Rule of Thirds framing technique. Objects such as a hill, church, tree or animal can be placed over one of the intersecting gridlines. Use this as your starting point in composing your shot. Don't be afraid to shoot in portrait orientation if a particular feature demands it; so you don't have too much dead space either side. Any strong curves or diagonal lines running up into your shot from either corner will enhance the image by leading the viewer's eye into, and around the scene.

Keep your balance

Are you finding that you cannot get a balanced exposure between the land and the sky? If the sky is overexposed, you could always crop it out and create another composition that is a tighter framed version of what you had. If your sky is an important part of the original shot, then consider an ND grad to make a more balanced overall exposure. If you are shooting during the day with blue skies and white clouds, try using a polarising filter. It will boost the contrast between the blue of the sky and the white of the clouds.

The pathway that leads up from the corner of the shot is a great device to draw the eye of the viewer into the shot.

A 2-stop ND grad filter is a useful item to have in your kit bag. It can help restore balance to overexposed skies.

The circular polariser is one of those 'must have' items in your camera bag. Once you have yourself positioned correctly in relation to the sun (between 90° and 180° away from the sun), turning the filter will darken skies and whiten clouds.

> "Any strong curves or diagonal lines running up into your shot from either corner will enhance the image by leading the viewer's eye into, and around the scene."

Cut it out

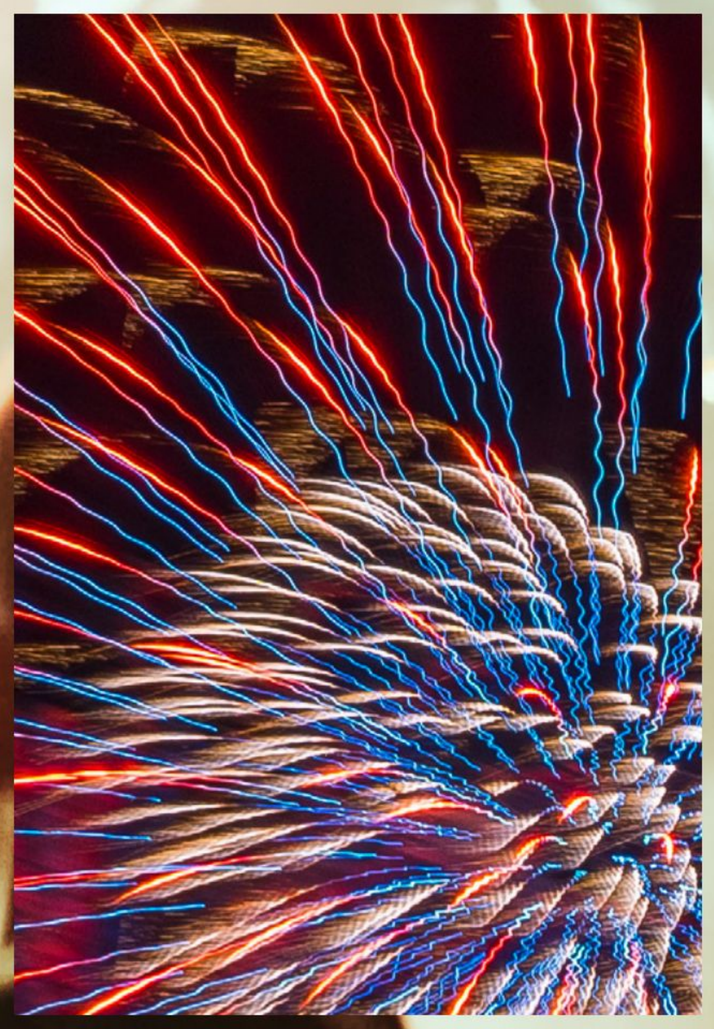
The final framing of your shot will determine if your photograph will stand or fall. Take your time with the final composition. Landscape painters will often use a piece of card with an aperture cut in it to use as a framing and compositional aid when viewing the landscape. There is no reason you can't do this too. Just match the aperture you cut in the piece of card to the proportions of your camera's sensor. Hold the card up to your eye at different distances and you can see the effect the different framing has on the composition of your shot.

Practice makes perfect

Here comes another cliché but one that is the basis of any learning experience. You can learn to 'see' with practice. As you photograph more, you learn more of what makes a good shot. The more you explore the more capable you are of making a good landscape photo, a great landscape photo. ■

Fireworks photography

How to capture all the explosive action



There was a time, and not even that long ago, when fireworks in the UK really only happened on Guy Fawkes night on November 5th or as a climax to some massive celebration or event. If you wanted a chance to photograph a big display, you were fairly limited and had to travel large distances to find them, or buy your own and set them off in your garden. These days it would seem that firework displays happen with a much greater frequency. Local towns will often end staged events with a display and there are even fireworks competitions where a number of teams with big budgets will each stage 10-15 minute displays. These competitions will often happen over a couple of consecutive nights so you get a couple of bites of the cherry so to speak. If you have access to a local display, what is involved in actually capturing the action? Photographing fireworks is easy and great fun, although it does require a little bit of preparation on the part of the photographer, and if you've never shot in full manual mode before, this is a good time to give it a go. It's not in the least bit difficult and we can show you how.

"These days it would seem that firework displays happen with a much greater frequency."

f / 10.0
2.0
--
ISO 160

The basics

Since this is a guide on shooting fireworks, you are going to be working in the dark. This means you will be dealing with longer exposures than normal and so the first order of business is to mention that all important tripod. Without the tripod, you cannot fix your camera in place in order to prevent unwanted image blurring due to camera shake. A blurry image cannot be rescued with post processing. Even a tiny amount of movement can ruin a shot. Get your camera locked down securely on a good, sturdy tripod. You can also hang a heavy weight from the tripod's centre column in order to help minimise any kind of movement.

Some people also think that if their camera has image stabilisation (IS), turning it on will also help. In fact, it can have the opposite effect. A camera with IS turned on that is locked in place on a tripod, can actually generate unwanted image blurring. The effect is generally more noticeable at longer focal lengths, but it is there. Remember then, turn off IS when the camera is securely mounted.

Cameras and lenses

The great thing about this kind of photography is that you don't really need any specialist cameras or lenses. You are more than likely going to be dealing with exposures no longer than a few seconds, so as long as you can set your camera in manual mode and dial in a maximum exposure of 10 seconds, you will be fine. In addition, if your camera does have a setting for Bulb mode, which allows the shutter to be kept open as long as the shutter button is pressed, then this is also useful.

Lens choices are also not critical here. Even a cheap point and shoot camera with a built-in lens has a focal length range perfect for this kind of work. You will also be dealing with apertures around the f/8-f/11 mark, so expensive f/1.4 lenses need not apply. Ultra wide-angle lenses are possibly going to be less effective if you are shooting from a distance, which is very likely given that the display has to be a certain safe distance from the crowds anyway.

Remote release

Since you've gone to all the trouble to secure your camera and lens to a tripod, manually pressing the shutter release button to capture your shots is just reintroducing the possibility of jogging the camera. To avoid this, you could use a remote release which can connect to your camera via a cable or by using a wireless version to trigger the camera instead. Using a remote

From a simple cable release to activate the camera without touching it, to more complex, programmable intervalometers, you have plenty of affordable triggering options for your DSLR.

Even point and shoot cameras can provide you with some great fireworks photos. They may not have ultra wide lenses, but since you are likely to be at a distance, that is not going to be an issue.

A sturdy tripod is essential to eliminate camera shake and prevent blurry images.

release removes the possibility of nudging the camera as you press the button. If your camera doesn't have this facility, but does have a self-timer, you can use this at a pinch. The downside is that self-timers usually give you either a 10 second or 2 second countdown before firing. Even a 2 second delay may be tricky when it comes to trying to time the start of your exposures with the fireworks as they are going off.

Focusing in the dark

Once you're all set up, it's time to figure out how to focus in the dark. As a general rule, since you are going to be some distance from the action, you can set your lens to manual focus and set it at infinity and leave it there. The infinity symbol, which looks like the number eight on its side, will be marked on your lens. If your lens doesn't have a focus distance window, you can always use a torch to illuminate a point about one third of the way into the scene or roughly 5m-10m. You can then set manual focus on that spot.

Cheap but powerful LED head torches are extremely useful in keeping your hands free for camera operation and button pressing.

Shooting from a distance means you can set your lens to focus on infinity and just leave it there during the shoot.

Bring some light

Speaking of torches, it makes sense to bring one. Better still, a head torch is great for keeping your hands free to alter settings and operate the remote release if you are using one. Head torches are lightweight and cheap to buy. Their LED bulbs mean that a set of batteries will last for ages and can provide plenty of light to work by.

Setting up

It makes sense to get to your venue early in order to nab the best spots to make the most of the display. Arriving late and having a sea of heads in your foreground, dominating the shot, is not going to work unless you can raise your camera on its tripod high above the crowd and use them to frame the bottom of the shot. If you do this, you may need a small stepladder or stool to get your head up to the same height as your viewfinder.

As long as they are not too intrusive, you can use foreground crowds to frame the lower portion of your shots.

About Raw

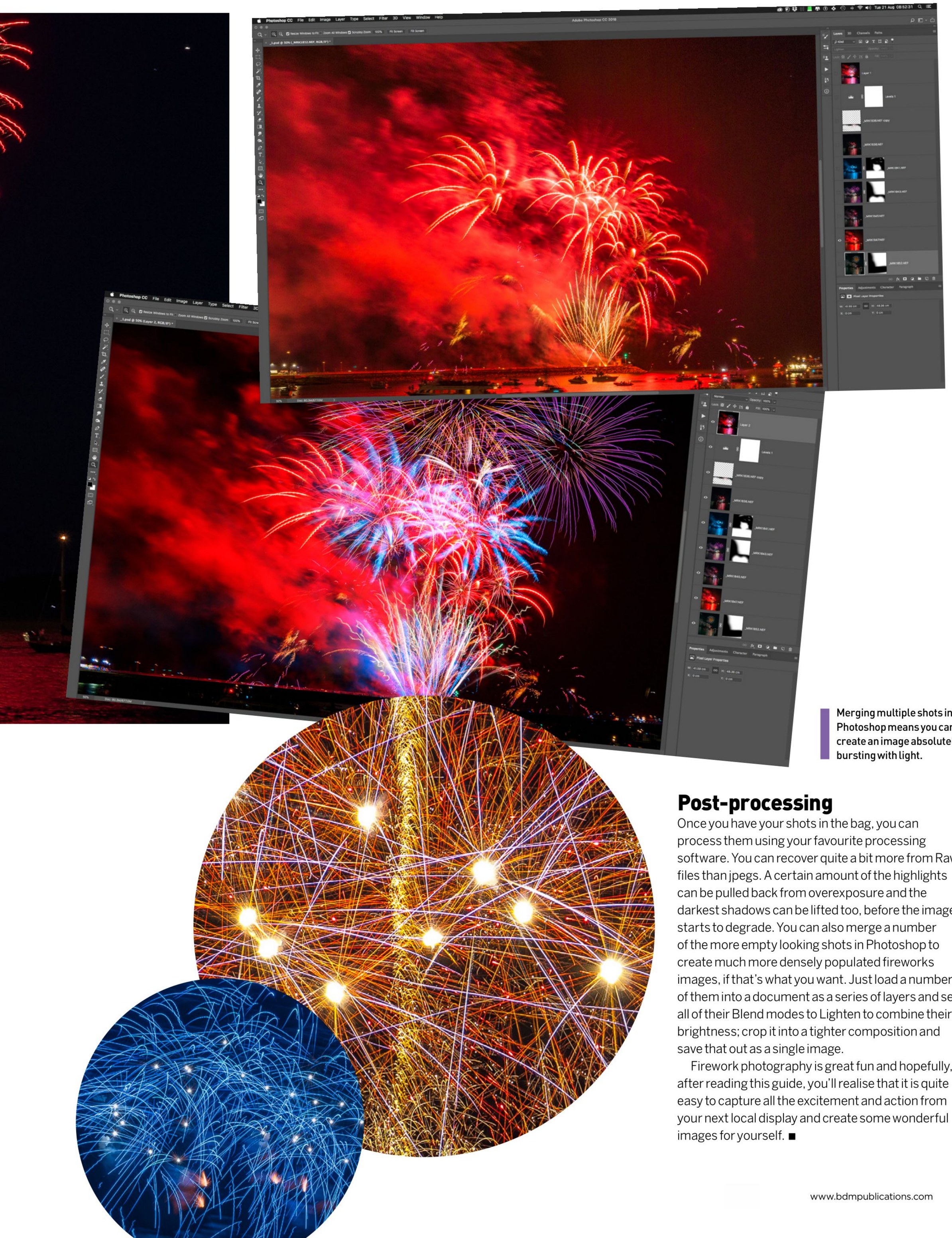
Yes, once again we have to talk about Raw mode. If your camera supports it, use it. You can glean so much more data from a Raw file than an already processed jpeg file. Besides, if you take all your shots as jpegs and use the wrong white balance for instance, all your jpegs will be processed with the wrong white balance. With Raw, it doesn't matter what white balance you use, as you can alter it at the post-process stage anyway.

Settings

Until the fireworks actually start, it will be difficult to actually get your settings dialled in precisely. If you were to try to get a decent exposure without the light from the fireworks themselves, you may find that the ambient light is much dimmer, requiring a longer exposure. That longer exposure may result in the much brighter fireworks being badly overexposed and blown out to white. A very broad rule of thumb is to try starting with an aperture of f/11, a shutter speed of 2s and ISO 200. Once the display starts, you can grab some test shots and analyse the images on your camera monitor screen. If the images are blown out, you can either reduce the amount of time the shutter stays open, increase the aperture to f/16 or drop the ISO to 100 or 50. Take another shot and see how it affects your photos. Try altering one setting at a time rather than making lots of changes at once. Be aware that different fireworks and their colours will have different intensities too. If the fireworks look too dark, you can increase the ISO gain, open up the aperture to f/8 or increase the exposure time. One thing to bear in mind is that longer exposure times will create much longer light trails in your photos. This comes down to personal choice of course, but bear that in mind.

Take the shots

Now you can concentrate on getting the shots. Firework displays have low-level and high-level displays. The high-level fireworks generally give the bigger explosions and are usually fairly easy to spot as you can see the fired rockets climbing much higher into the sky. It comes down to timing to guess when the rockets will actually explode, but keep your thumb on the remote release and get ready to press. If you have a decent sized memory card, just keep shooting. There is actually a great little trick you can employ once you are back at home to combine some of the shots that have little going on in them. Another option is to set your camera to Bulb mode. Then you take a small piece of black card and cover the lens with it. Be careful not to bump the camera with it. Open the shutter and keep it open using Bulb mode and only uncover the lens when there is firework activity that you want to capture. If the lens is covered, no light is getting in, so you can keep the shutter open as long as you want. Keep uncovering the lens for each light trail you want captured. Once you have amassed a few seconds worth of light trials, you can close the shutter again. You can experiment with different focal lengths to pick out details from the display and also try shooting in either landscape or portrait orientation.



Merging multiple shots in Photoshop means you can create an image absolutely bursting with light.

Post-processing

Once you have your shots in the bag, you can process them using your favourite processing software. You can recover quite a bit more from Raw files than jpegs. A certain amount of the highlights can be pulled back from overexposure and the darkest shadows can be lifted too, before the image starts to degrade. You can also merge a number of the more empty looking shots in Photoshop to create much more densely populated fireworks images, if that's what you want. Just load a number of them into a document as a series of layers and set all of their Blend modes to Lighten to combine their brightness; crop it into a tighter composition and save that out as a single image.

Firework photography is great fun and hopefully, after reading this guide, you'll realise that it is quite easy to capture all the excitement and action from your next local display and create some wonderful images for yourself. ■

> “It’s best to take this sort of photo on a day that’s bright, but not too sunny, because it’s easy to burn out highlights on a longer exposure.”

Misty water effect

Fast flowing water looks great with a slow shutter speed

This mist-like waterfall effect is very popular and looks great when it’s done right. It looks challenging, but in fact it’s very easy to set up. All you need is a tripod and any camera with manual shutter speed control.

The hardest part is finding a stream or river that has a nice photogenic waterfall or some rapids. Use your common sense and always exercise caution around fast-moving water; it may be deeper than it looks, with strong currents.

It’s best to take this sort of photo on a day that’s bright, but not too sunny, because it’s easy to burn out highlights on a longer exposure. A calm day is best, because you don’t want any trees or plants waving about in the wind and being blurred too.

Set up your camera using a good solid tripod on solid ground, and set the shutter speed to one second. Trigger the shutter using a cable release, a remote control or the two-second timer, so as to avoid any camera shake. You may need to experiment with different shutter speeds, depending on how fast the water is moving, but somewhere between half a second and two seconds should produce the effect you’re looking for.

For longer exposures you may have to invest in a neutral-density filter to avoid over-exposure. ■

The Canon EF 24-70 f/2.8 L II USM series wide angle zoom lens. Top notch, fast optics make for a great landscape lens. It delivers amazing image quality throughout its zoom range and it’s maximum aperture of f/2.8 allows for hand-held shooting in low light.

Careful control of shutter speed can produce some beautiful effects. This huge Icelandic waterfall takes on a soft, almost mystical quality when photographed at a shutter speed of several seconds. Be sure to use a tripod though!

Glossary

Aperture
Behind the lens of your camera is a movable circular iris which opens and closes to control the amount of light falling on the sensor. This is usually controlled by the camera's light meter, although some cameras have a manual aperture control. Altering the aperture also changes the depth of field.

Aperture priority
This is one of the semi-manual exposure options found on some cameras. The user sets the aperture according to the depth of field they require, and the metering system sets the shutter speed to obtain the correct exposure.

Artefacts
When an image is stored in your camera's memory it has to be compressed to fit, usually into a JPEG file, and in the process some information is inevitably lost. When the image is uncompressed for viewing, noise creeps in and appears as angular blocks in the image, which are known as artefacts.

Autofocus
Almost all digital cameras have automatic focusing. There are essentially two types; contrast detection, used in compact cameras and most CSCs, uses the camera's main sensor and works by detecting the borders between high-contrast areas and trying to make them as sharp as possible. Phase detection AF is used in digital SLRs and some CSCs, and uses a separate sensor. It is usually faster and works better in low light.

AE lock
Stands for Auto-Exposure Lock, a function found on most advanced digital cameras. This enables you to take a light meter reading from a particular part of the image and then hold that setting while you compose the image.

Back lighting
Backlighting occurs when your subject is brightly lit from behind, such as somebody standing in front of a sunlit window. Unless you adjust the exposure to compensate for this, your subject will appear as a dark silhouette against the bright background.

Barrel distortion
Barrel distortion occurs when a lens, usually wide-angle, distorts an image so that it appears slightly spherical. If you take a seascape with a wide-angle setting and notice that the horizon seems to curve, this is barrel distortion. It's most noticeable when there are straight lines near the edge of the frame. In digital images barrel distortion can be corrected in image-editing software.

Bokeh
The visual quality of the out-of-focus areas of a photographic image, especially as rendered by a particular lens.

Bracketing
Bracketing shots is where a photographer takes the same shot three times or more, each at different exposures. This increases the chance of getting an ideally exposed image. Also, it's possible to combine the shots in software to increase the light and shade within the image, which is how HDR works.

Burst mode
Many cameras offer a burst mode, which means they can take several images in rapid succession, just as you'd get with a motor-wind on a traditional film camera. The number of shots that can be taken is limited by the speed of the camera's image capture and processing systems, as well as the size of the internal memory buffer. You'll typically get about three frames per second from a standard digital camera in burst mode.

Centre-weighted metering
This is when the camera takes an average light reading from the whole frame, but pays more attention to the centre of the image where the subject normally is. This has been largely superseded by multi-pattern metering, which is better able to cope with unusual situations.

CCD
Stands for Charge Coupled Device. This is the light sensor behind the lens of your camera that records the image when you take a photograph. It consists of a grid of millions of tiny light sensors, one for each pixel of the image. The size of a CCD is measured in megapixels, and the higher the megapixel rating, the better the image quality.

Chromatic aberration
Coloured fringes that appear around objects, often toward the edges of the frame. Caused by light rays of different wavelengths coming to focus at different distances from the lens.

Circular Polariser
A filter that is placed in front of the camera lens in order to darken blue skies, manage reflections, or suppress glare.

CMOS
Stands for Complimentary Metal-Oxide Semiconductor. A chip-manufacturing technology used to produce the sensors in an increasingly large proportion of digital cameras. Cheaper but with better tolerance than other methods.

Depth of field
When you focus your camera on a subject, some detail behind and in front of the chosen subject will also be in focus. The distance between the nearest and furthest in-focus objects is known as the depth of field. It is changed by altering the size of the aperture; the smaller the aperture, the larger the depth of field.

Digital zoom
Some cameras give you the option of zooming in on the centre part of an image by expanding it in the camera. Although the zoomed area looks bigger, it still contains the same number of pixels as it did originally, so it will appear blocky and will lack resolution. Not to be confused with optical zoom, which is far superior.

Dynamic range
The difference between the lightest and darkest areas of an image. If a camera can simultaneously capture shadow and highlight detail then it has good dynamic range. Few cameras can do both.

DPI
Stands for Dots Per Inch. The sharpness of an image produced by a printer is defined by how many dots of ink per inch of printed paper its print head can produce. A figure of 1,200dpi or higher is usually required for photographic-quality results, although most modern printers are capable of this.

Effective pixels
Although your digital camera may claim to have 13.6 million pixels on its CCD, some of that number will not be used for taking the picture. Usually, some pixels around the edge of the sensor are painted black to provide a colour balance, while others fall outside the range of the lens.

Electronic viewfinder
Some cameras have a viewfinder containing a miniature LCD monitor showing you what the camera sees. This usually uses less battery power than the LCD screen on the back of the camera, but can be a strain on the eye and difficult to focus.

Exposure
When you take a picture, the light meter in the camera determines how long the shutter should be open for and how wide the aperture should be, thus obtaining the correct exposure. If a picture is too dark, it is underexposed, whereas if it goes the other way and is too light, it is overexposed.

External flash
This means that the camera has a connection, usually a hot shoe, that enables you to use a flashgun other than the one built into the camera. This allows a lot more creative freedom and control over lighting, because the flash can be positioned further away from the camera. This feature is only usually available on more expensive or professional-quality cameras.

EXIF
The Exchangeable Image File (EXIF) format is used by nearly all digital cameras that output pictures as JPEGs. It enables information, such as the GPS co-ordinates, date and time the shot was taken, plus exposure and other camera information, to be stored in the image file alongside the normal picture information.

Fixed focus
Cheaper cameras have fixed-focus lenses, which means they cannot be adjusted. Instead they rely on a very narrow aperture to make everything appear in focus, from a few feet in front of the camera out to infinity. They are fine for snapshots at average distance in good light, but are not so good for creative photographs where focus can be used to produce unusual effects.

Focal length
In brief, this term describes the magnifying power of the camera's lens. The longer the focal length, the greater the magnification. Conversely, the smaller the focal length, the more wide-angle the lens. Most digital camera zoom lenses can vary between short and long focal lengths.

f-number
This is the number which describes the ratio of the aperture of a camera's lens to its focal length. Generally, a higher quality lens will have a smaller f-number, which bizarrely means a wider maximum aperture, and thus more light entering the lens. See also 'Depth of field' for more information about focusing.

Forced perspective
This is a technique which employs optical illusion to make an object appear farther away, closer, larger or smaller than it actually is.

HDR
A rather over-used technique whereby several shots at different exposures are combined to produce one image capturing a very wide range of contrast, or dynamic range. Useful for high-contrast lighting and night-time shots, but can be over-used by art students who've just discovered it.

Histogram
A histogram is a graph of brightness.
It ranges from black through grey to white along the horizontal axis, while values in the vertical axis represent the number of pixels at the appropriate brightness. It

provides a means of checking the exposure of an image. If too many pixels are present at the left-hand side of the histogram, the image is underexposed, while if it's weighted to the right, then it's likely to be overexposed.

Hyperfocal Distance
This is the distance between a camera lens and the closest object which is in focus when the lens is focused at infinity.

Infrared
Infrared (IR) light is the part of the EM spectrum that people encounter most in everyday life. It is invisible to human eyes, but people can feel it as heat.

Interpolation
Some cameras and image-editing software can increase the size of a digital image by adding extra pixels in between the original ones. They take an average of the pixels around the new one and attempt to match the colour and brightness to create a seamless image. Some systems give better results than others.

ISO
Stands for International Standards Organisation. In conventional photography, the ISO number is a measure of the light sensitivity of photographic film, and this has been carried over into digital photography as a way of expressing the light sensitivity of the CCD.

JPEG
This file type stands for Joint Photographic Expert Group, and is the most commonly used system of image compression. Using a sliding scale between file size and picture quality, it enables digital cameras and computers to squash a large picture into a small amount of memory. Be careful when compressing files, though, because too much compression will reduce the quality of your image.

Landscape mode
A program exposure option found on many mid-priced cameras, this function automatically selects the best exposure settings for taking landscape photographs, usually a longer shutter speed and the narrowest possible aperture to maximise depth of field. It can also refer to holding the camera horizontally, which is usually preferred for landscape shots.

LCD
Stands for Liquid Crystal Diode, a display technology first developed in the 1970s, and in widespread use today. Most cameras have an LCD monitor screen mounted on the back for viewing photographs. Some also have an LCD electronic viewfinder, and some DSLRs also have a separate LCD data display panel.

L-ion
Stands for Lithium Ion. This is the latest kind of rechargeable battery, superior even to Ni-MH. It can hold more power, and does not suffer from 'memory effect', where a partially charged battery, when recharged, will only register the additional charge rather than its full capacity. However, L-Ion batteries are quite expensive.

Macro mode
Refers to a lens that can focus closer than its designated focal length, but these days it is used to describe any facility for taking extreme close-ups.

Manual mode
Found on higher-end cameras, this is for experienced photographers only. It gives you full control over both aperture and shutter speed, enabling you to experiment with exposure and depth of field. Essential for creative photography.

Megapixel
Megapixels are a measure of the size and resolution of the pictures that a digital camera can produce. Mega means one million, and in this case a million pixels, or more accurately a million individual light sensors on the camera's CCD. The more megapixels, the better.

Memory card
Most digital cameras store your pictures on removable cards full of computer memory. They come in a variety of sizes and there are several different types, including CompactFlash, SD and MicroSD cards as well as Sony's own MemoryStick format.

Metering system
This is how the camera measures the amount of light being reflected by whatever you are trying to photograph, to determine the correct exposure for that particular scene. There are many different types, including spot metering, multi-pattern metering and centre-weighted metering.

Monobloc
A monobloc is a self-contained flash unit usually found in a photographic studio.

Multi-pattern metering
This is a sophisticated means of determining the correct exposure of a photograph. The camera takes light readings from several different areas of the frame and compares them to its pre-programmed data.

Night-time mode
A program exposure mode that compensates for low light by setting the aperture to maximum. This lets the most available light into the camera and gives the fastest possible shutter speed under the circumstances.

Optical zoom
With recent advances in lens manufacturing technology, many digital cameras now have small but powerful optical zoom lenses. This means they can be adjusted to magnify the image (zoom in) or to capture a wide-angle shot (zoom out). Because the image uses the full capabilities of the CCD this is preferable to digital zoom.

Pixel
Short for Picture Element. If you enlarge a picture on your computer, you will see that it is made up of tiny squares of a particular colour and brightness called pixels. A pixel is the basic building block of a digital photograph, and there can be several million of them in an image. The higher the pixel count, the better the quality of the photograph.

Portrait mode
This is a program exposure mode that optimises the camera for taking classical portrait shots, widening the aperture to minimise the depth of field. This ensures that only the subject is in focus, while the shutter speed is increased to minimise camera shake.

Processor
All digital cameras have an image processor, which takes the data from the sensor and turns it into the finished JPEG image that you see on the screen. A faster processor means larger resolution images can be processed more quickly, improving the camera's performance.

Program exposure
Found on most digital cameras, program exposure is an automatic setting where the camera's metering system selects an appropriate aperture setting and shutter speed in an attempt to get the best exposure and performance out of the lens.

Raw
Raw mode is found on most high-end digital cameras. It is an option which stores the uncompressed raw data from the sensor, which can then be processed on a computer using software such as Adobe Camera Raw, Bibble etc. Raw files contain more information than JPEGs, and take up more memory. Raw is actually not an acronym and so shouldn't be all capitals; it should really be written simply as "raw".

Resolution
The more pixels there are in an image, the larger that image will be. This is the resolution of the picture, and is usually expressed as two numbers representing the height and width of the image in pixels, such as 3,872 x 2,592. Multiplying these two figures gives you the effective megapixels, in this case 10.03MP.

Shutter
The shutter is a device behind the lens of the camera which is normally closed, but opens for an instant when a picture is taken to allow light into the camera and onto the CCD. The length of time the shutter is open for is determined by the metering system, and is known as the shutter speed.

Shutter priority
This is a semi-manual mode that enables the photographer to specify a shutter speed while the camera's metering system sets the aperture for the correct exposure.

SLR
Stands for Single-Lens Reflex. A mirror or prism reflects the light coming in through the lens to the viewfinder, so when you look through it you see exactly what the camera can see.

Spot metering
Found on the more expensive cameras, this metering mode enables the photographer to take a light reading from a small area in the middle of the frame, usually marked in the viewfinder. This is the best way of dealing with difficult lighting conditions such as backlighting, and is normally used in conjunction with auto-exposure lock.

Time lapse
We've all seen films of flowers opening at incredible speed, or the sun and clouds racing across the sky. This super-fast motion technique is called time-lapse photography, whereby a stationary camera takes several successive shots at time intervals of a few seconds, minutes or even hours. The images are then played back rapidly, giving the impression of continuous motion.

VGA
Stands for Video Graphics Array, and refers to an image size of 640 x 480 pixels. This was once the standard size of a computer monitor output, but these days even mobile phones have larger displays. VGA is still sometimes found as an image size mode, particularly in the video recording modes of some cheaper cameras.

White balance
Most modern digital cameras automatically adjust the colour balance of the picture to compensate for any tints in the ambient light, such as sunlight, fluorescent strip lights or normal light bulbs. This is called a white balance, and means you can take a picture indoors without that orange tint you get with a film camera.

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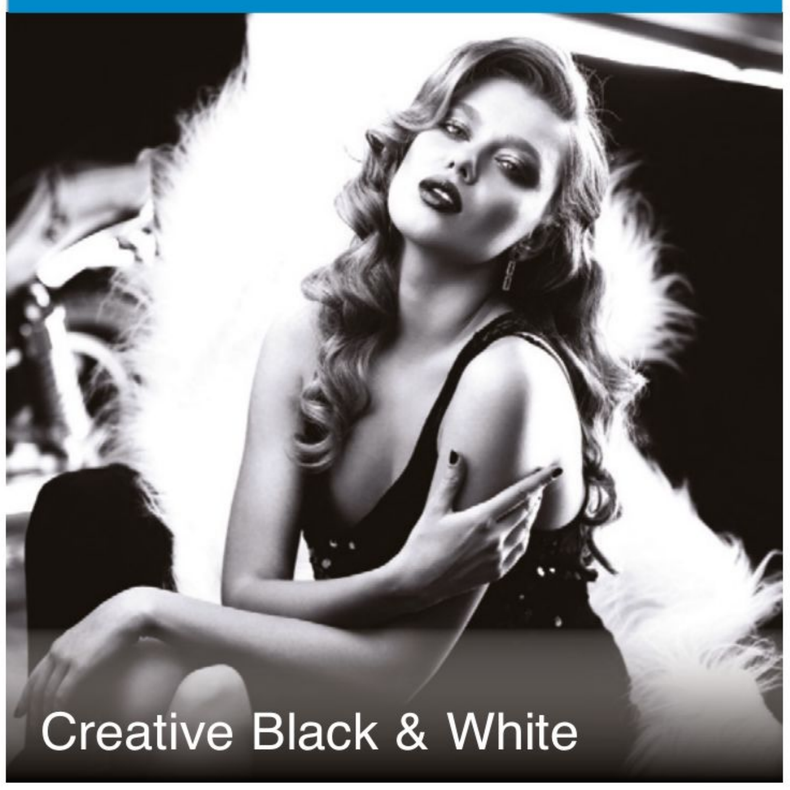

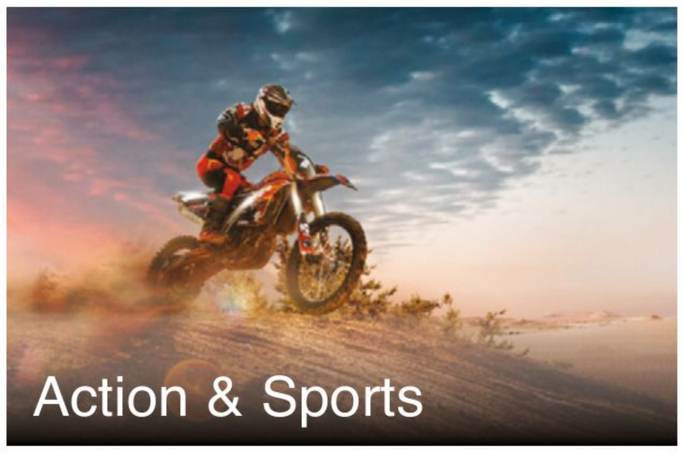

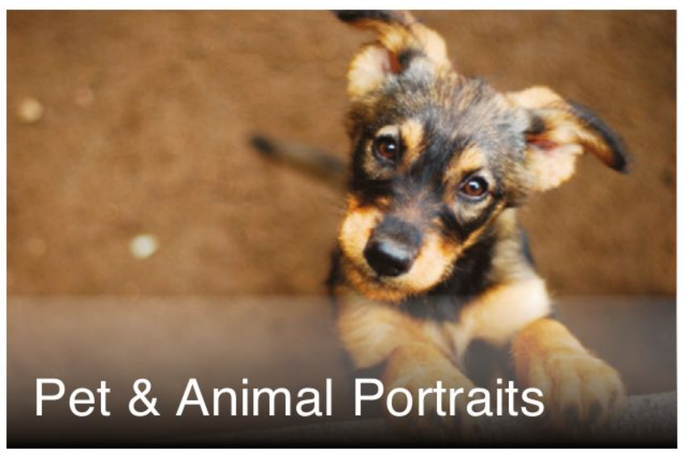

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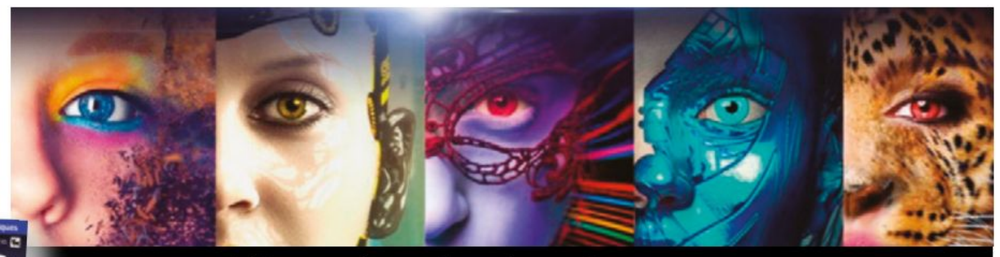

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BDM's Independent Manual Series
5th Edition
ISSN: 2058-8402

Published by: Black Dog Media Limited (BDM)
Managing Editor: James Gale
Editor: Mark Frost
Sub Editor: Alison Drew
Production & Art Director: Mark Ayshford
Production Manager: Karl Linstead
Design & Artwork: Mark Frost
Printed in Great Britain by: Acorn Web Offset Ltd
Print Services supplied by: Media First (International) Ltd
Newsstand distribution by: Seymour Distribution Limited
2, East Poultry Avenue, London EC1A 9PT
International distribution by: Pineapple Media Limited
www.pineapple-media.com
Digital distribution by: Readly AB, Pocketmags, Zinio, Cafeyn, Magzter

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