

Landscapes | Nature | Macro | Astrophotography | Gardens | Wildlife

OUTDOOR LANDSCAPE & NATURE PHOTOGRAPHY

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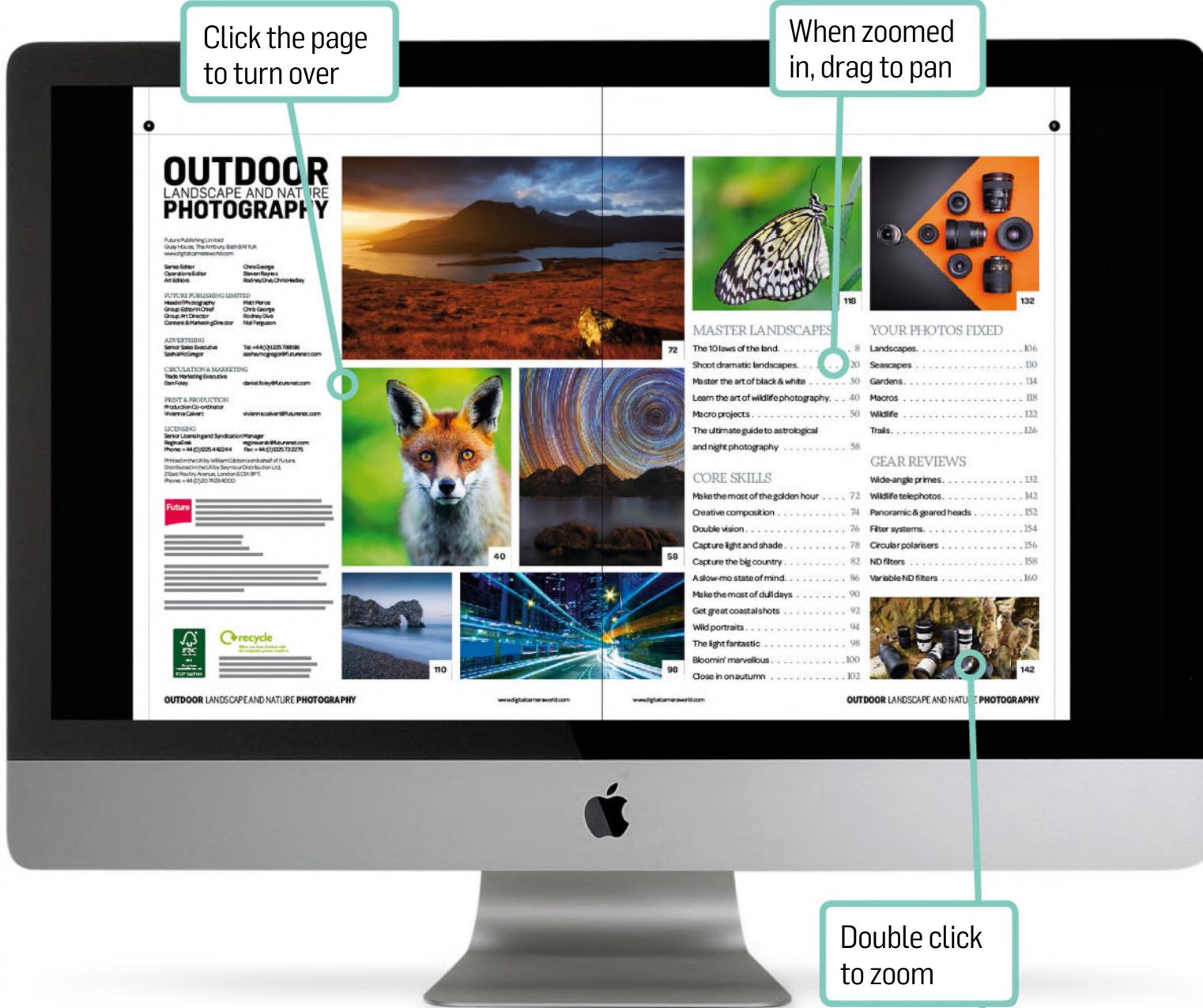
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OUTDOOR LANDSCAPE AND NATURE PHOTOGRAPHY



Many of us aspire to capture the feeling we get when we gaze over a dazzling mountain scene or rolling countryside with hay waving in the gentle breeze. Some of us also like to move in closer to shoot interesting flora and fauna. Others like the additional challenges of shooting at night or in less conventional outdoor environments. Whatever natural scene you want to capture, *Outdoor Landscape and Nature Photography* will show you how it's done, from choosing the right equipment to setting it up correctly and getting the shot.

We kick off with a selection of in-depth features that focus on the skills you need to take stunning pictures of landscapes, flowers, animals and more. This is followed by a chapter on the core skills every nature photographer needs to master. Here you'll discover how to choose optimum shooting times and locations, how to use compositional tricks to your advantage, and how to make the best of challenging conditions while out in the field. Next we tag along on six one-on-one nature photography sessions, where seasoned pros share years of experience with enthusiastic apprentices. Our final section reviews and rates some of the equipment you may be interested in acquiring to take your nature photography further, from wide-angle and telephoto lenses to specialist filters and tripod heads. No matter what your experience level, whether you're an enthusiastic beginner or a seasoned expert, you'll find plenty within these covers to excite your imagination – and to improve your photography skills with your digital SLR. If you enjoy the book, visit www.myfavouritemagazines.co.uk/photography to discover more great titles in the series.

Chris George, Series editor

OUTDOOR LANDSCAPE AND NATURE PHOTOGRAPHY

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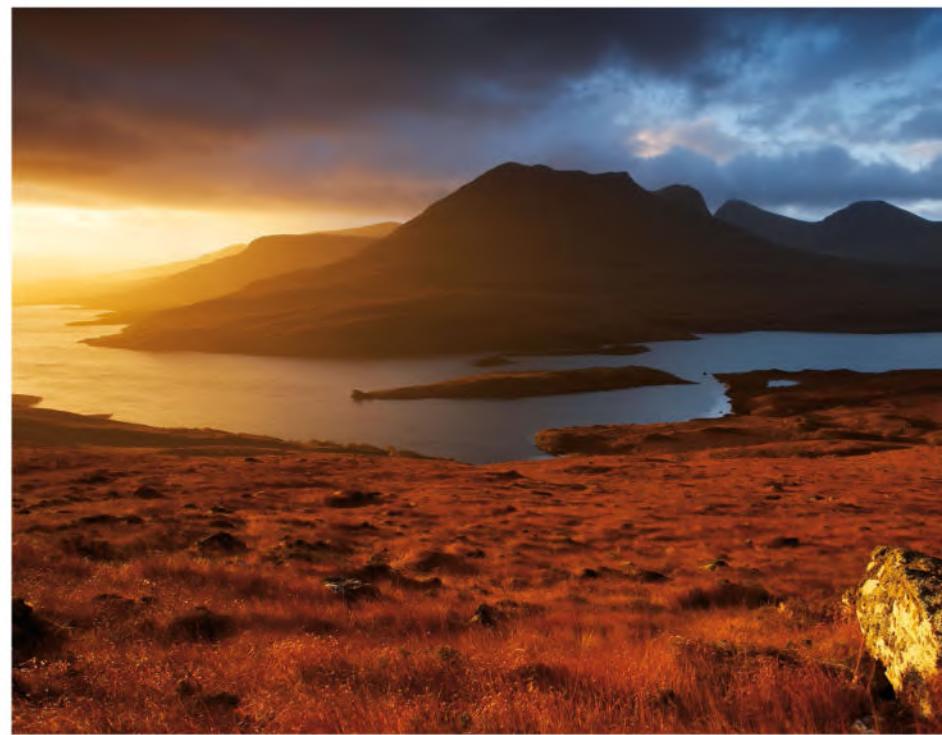
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10 LAWS OF THE LAND!

We reveal the 10 essential rules you shouldn't break when shooting landscapes

Landscapes can be one of the easiest of all photographic subjects. Basically, all you need to do is find a nice view in the right lighting and snap away. Look a little closer at landscape images that really hold your attention, however, and you'll often find that there's much more to this simple subject than meets the eye.

To improve your landscape shots, you need to find visually compelling locations, and then you need to work out the right

time of day and the right season to visit them, so they're looking their absolute best. Once all of this research and planning is done, you need the technical and artistic skills to make the most of the scene. All of this comes with practice – but where do you start, and how can you give yourself the best chance of landing some great shots?

That's where this guide comes in. Rather than simply tell you to set your camera to f/16, fit a wide-angle lens and

use the rule of thirds, we'll reveal the ten 'laws' that will help you plan more effectively, compose your shots, and understand when a trick or two might help. You'll improve your success rate by going to the right places at the right times, and you'll know how to get amazing images at any location.

So, don't let your landscape photography get stuck in a rut: read each of these laws and take your landscapes to the next level.



THE 10 LAWS OF LANDSCAPE PHOTOGRAPHY



Page 10
Do your research



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Be flexible



Page 12
Look at all angles



Page 13
Don't rely on filters



Page 14
Head out in storms



Page 15
Move around



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Be experimental



Page 17
Be minimalist



Page 18
Shoot in mono too



Page 19
Go back again

10 laws of the land

LAW 1

DON'T LEAVE LOCATIONS TO CHANCE

Learn everything you can about your landscape before you go there – from likely viewpoints to where to park

You're unlikely to stumble across great landscape locations by just going out into the country. It may seem like a lot of work to do, but it's easy to check out the location, sun position, weather and tides before you set off.

The first port of call for most locations is an online map service, such as Google Maps (<http://maps.google.com>). The amount of detail available on the satellite view, along with the Street View facility, is invaluable for getting an insight into the basic features and landscape.

Check out online photos of the location. We're not suggesting you copy the approaches and styles employed by other landscape

TOP TIP

Research doesn't just mean trawling the web. Nothing can beat checking out locations on foot. Whenever you have the chance, get out and explore

photographers: the images we use are more likely to be shots taken by tourists, say, who simply want to record the sights. These shots are perfect for getting a good idea of what to expect from a location, without the risk of subconsciously imitating what other photographers have done.

It's worth doing this process even for areas you think you know well. It's amazing how many hidden gems we've found just by using online maps and images.

DIG DEEP

Once you've narrowed down the area that you're interested in, look at detailed maps like the Ordnance Survey series (www.ordnancesurvey.co.uk). These give precise details of paths and access, although you should check an online map as well to see if there are any other options. Look for likely car parking spots.

Next, check when and where the sun will rise and set. There's little point going to a location if the main subject is in shadow because the sun's behind a mountain. There are plenty of online resources, plus apps such as the Photographers' Ephemeris (www.photoephemeris.com).

"There's little point going to a location if the main subject is in shadow because the sun's behind a mountain"

ON LOCATION LLANGATTOCK ESCARPMENT, SOUTH WALES

- We've shot in the Brecon Beacons for many years, and have often driven past this location. We came across it again on Google Maps and, after a few minutes' research, decided it was worth a visit. Through the map, we found a car park not far from the escarpment, so we only had to walk for 30 minutes to get to the top. The cliff faces east, so it would only be bathed in light at sunrise.

Then it was simply a matter of waiting for the right weather forecast. We wanted a still, clear morning, which would mean that mist would hang in the valley. The mist didn't materialise, but we were rewarded with a beautiful sunrise.

Checking the time and position of the sun was crucial for capturing its rise over the distant hills



ON LOCATION SNAEFELLSNESS PENINSULA, BOGARFJÖRÐUR, ICELAND

● The plan for this location was to shoot the mountains and glacier in the middle of the peninsula from the rocky shore on the north coast. The light was perfect, and there were a few clouds hugging the top of the mountains, just as we had anticipated.

When we arrived, though, the northerly wind was much stronger and more gusty than had been forecast. This meant that the moment we got the camera out, the lens and filters were covered in spray, making it impossible to get any clean images. We had to quickly find a new location where we could get some shelter from the spray before the light disappeared.

A few minutes later, we found a spot: a small lagoon just inland from the shore, where the wind wasn't quite as strong and the spray didn't always reach. It was still a battle to keep the tripod steady, and we had to clean the lens before every shot, but I managed to capture the amazing light on the mountains without getting covered in spray.

With wind and spray making it impossible to shoot in the first location, finding a more sheltered spot proved worthwhile



LAW 2

DON'T STICK TO YOUR PLAN, REGARDLESS

Caught out by an unexpected shower? Make sure you have the flexibility to get the most out of your day

Even though you should always go out with a researched plan of what you want to shoot, it's never set in stone. Mother Nature has a habit of regularly throwing plenty of curve-balls at you when you're out on location. Expect the unexpected.

From surprise rain showers to strong wind and even pea-souper fog, it's usually the weather that will scupper the best-laid plans. Along with the weather, you might also encounter unexpected alterations to a landscape, such as changes in the trees or flora, changes in water levels and even more dramatic events like

TOP TIP

When things don't go to plan, it's handy to have a paper or electronic map on hand, to allow you to come up with an alternative location or viewpoint

landslides, which can all alter the scene dramatically, or simply prevent you from getting to your chosen location on time.

TIME FOR PLAN B

This is where it pays to have a back-up plan – and also to give yourself plenty of time to arrive at your shoot if you're planning on

working around sunrise or sunset. We usually try to get to a location at least 30 minutes before we think we might want to start shooting – even if it's a place that we've visited before and know well – to give ourselves the time to explore the surroundings and come up with an alternative if things go wrong.

The bottom line is that no plan is perfect, however good your research is – but quite often we've found that having to think on our feet produces some fresh ideas that work even better than the original concept.

"Having to think on your feet produces fresh ideas that often work even better than the original concept"

10 laws of the land

LAW 3

DON'T ALWAYS USE WIDE-ANGLE LENSES

Be aware of the possibilities zoom or telephoto lenses can give you, and you'll end the day with more creative images

Many landscape photographers shoot 80 per cent of their landscapes with a wide-angle lens, but it's still worth taking along a longer lens for capturing those distant details that are impossible to shoot with anything else. For that other 20 per

cent of images, around half are shot using the longer focal length setting of a standard zoom, the other half with a telephoto lens.

Shooting details from a distance means that you get the classic compressed perspective effect, where the foreground and the background

"It's worth taking along a longer lens for capturing those distant details that are impossible to shoot with anything else"

TOP TIP
If you don't have a long enough lens to isolate detail, use the longest lens you have, and simply crop the image later on. You'll lose some resolution, but the end result will be worth it

appear to be very close together. The further you are from the subject, the more pronounced the effect will be, which means you'll also need a long focal length to fill the frame with these very distant subjects.

STITCHED UP

The other occasion where a longer focal length lens comes in is if you're shooting a panorama. A wide-angle lens often distorts at least part of the image, making a sequence harder to stitch together. Using a telephoto lens keeps the perspective of the final result looking more natural.



ON LOCATION WEST WOOD, WILTSHIRE

- When you're shooting in a woods or a forest, a wide-angle lens can often produce images without a defined focal point. Look for more distant subjects to simplify the scene, and reach for a telephoto lens.

This is exactly how we arrived at this image (left). The trees in West Wood are so dense that shooting wide meant that there was simply too much going on in the image to get a good composition. This shot was taken at 200mm, and we used a wide f/2.8 aperture to give a shallow depth of field. The backlit leaves made a good focal point.



Using a telephoto lens enables you to isolate details and sections of the landscape, producing simpler and more striking results



RIGHT

ON LOCATION PORTH NANVEN, CORNWALL

When we shot this classic coastline, there was a huge contrast between the sky where the sun was setting, and the foreground water, boulders and cliffs. We tried using an ND grad, but this darkened the cliff on the right, which was an essential part of the composition, too much.

Instead, we took two shots – both at f/8 and ISO 100, but one with a shutter speed of one second to correctly expose the foreground and cliff; and another at 1/4 sec, to keep detail in the brightest areas of the sky. We combined them in Photoshop, using a layer mask to retain detail across the scene.



WRONG

LAW 4

DON'T USE AN ND GRAD FOR EVERY SHOT

Sometimes filters can cause problems rather than fix them, so get to know the tricks that can help you out

Normally, we would advise getting the shot right in-camera: it saves time and effort adjusting and manipulating images later on. We'd much rather use an ND grad filter to capture detail in both the sky and the landscape of a sunset or sunrise shot than use fancy software techniques. But there are situations where it's better to leave the ND grad filter in your bag and use other photographic techniques to balance the exposure.

TOP TIP

Camera Raw's Adjustment Brush and Graduated Filter tools mean you can often recover detail from a single raw file. But it's still worth bracketing your exposures for the best results

The classic case is when there are mountains, buildings or trees above the horizon in your shot, and the sun is low in the sky. In these conditions, it's impossible to keep detail in both the brightest and the darkest areas of the scene in a single exposure. But if you use an ND grad filter, any part of the scene above the horizon is darkened, making its use obvious.

The preferred method in these situations is to take two shots: one exposed for the sky and brighter

areas, the other for the land and darker areas. Open them as two separate layers in Photoshop, and use a layer mask to paint in the correctly exposed areas in each layer.

HDR-FREE

High-dynamic-range (HDR) processing is an option, but many people find that HDR rarely produces a natural-looking result, so we don't tend to use it for landscapes. The latest digital SLRs, and improved raw-processing software such as Lightroom 6, mean that you can often reclaim a lot of the highlight and shadow detail.

10 laws of the land

LAW 5

DON'T JUST SHOOT IN THE BEST WEATHER

Become a storm-chaser and you'll get much more dramatic shots – but make sure you stay safe

Even though we can see the attraction of shooting landscapes while the sun is shining, we're much more likely to get excited about the prospect of a good storm or weather front coming in than hold out for clear blue skies. This isn't because we like getting cold, wet and blown around by gales, but because the colours, textures and light you can get just before or after a storm are among the most dramatic and eye-catching conditions for landscape photography.

BE CAREFUL OUT THERE

Going out in a storm isn't to be taken lightly, because there are plenty of potentially dangerous things that can

TOP TIP

There's a danger of the wind moving your tripod in stormy weather. Try weighing it down with a bag – but make sure that it's touching the floor, or it might get blown around too!

happen to both you and your kit. So, you need to make sure that you're not putting yourself at risk, and that you have suitable clothing if the rain or wind takes a turn for the worse.

PROTECT YOUR GEAR

Of course, you also need to make sure that your camera gear is safe and remains dry. Take a strong, waterproof plastic bag (a bin-bag is perfect), so that you can quickly cover the whole camera if it starts to



The moody sky and soft light were perfect for capturing this striking shot of the Kerið crater in the Grímsnes area of south Iceland

rain while the camera's fixed to a tripod. Carry plenty of cleaning cloths for the lens glass and filters, along with a microfibre towel for drying off the camera body and lens.

"We're more likely to get excited about the prospect of a good storm or weather front than hold out for clear blue skies"

ON LOCATION WESTON-SUPER-MARE, SOMERSET

- Hearing a forecast for gale-force westerly winds, we naturally headed for an exposed coastal area, hoping the stormy skies would provide a perfect backdrop for a derelict pier as the sun set.

We knew that we could park the car near the sea wall, giving us a shelter if the weather got too bad. The wind blew spray over the high sea wall, but after a few minutes we found the spot.

Amazing colours showed through gaps in the cloud. It was hard keeping the tripod still, and we were constantly wiping rain and spray off the filter, but we got the shot. Then the heavens opened. Time to escape back to the car!

Enduring gale-force winds and spray coming over the sea wall was worth it for the amazing clouds just before sunset





ON LOCATION KIRKJUFELL, ICELAND

● This iconic mountain was on the top of our list of places to shoot in Iceland, and we had seen many images taken from the nearby waterfalls long before we went there. So this was the first place we headed to at sunrise – and we weren't disappointed. The waterfalls provided the perfect foreground interest for this image (top), and Kirkjufell is a perfect pointed mountain from this viewpoint. We spent an hour or two simply exploring these waterfalls, finding several different viewpoints.

We also wanted to shoot the mountain from different places, because it takes on a very different shape and character from the side. From these viewpoints, instead of

a pointed mountain, it becomes a softer, more rounded shape, while the water that surrounds it offers a different foreground to the waterfalls that are the more common viewpoint.

Because of the distances between these viewpoints, we couldn't capture them all in the dawn light. So after shooting at the waterfalls at sunrise, we spent a couple of hours exploring the area. This meant that we could come back to it at sunset – first shooting with the sun behind us lighting the mountain; then finally shooting it from the east, just as the sun set behind it.

Shooting from three widespread viewpoints has created very different images of this iconic mountain in Iceland



LAW 6 DON'T SHOOT FROM JUST ONE VIEWPOINT

Explore your location thoroughly and you might find the viewpoint everyone else wishes they'd shot from

After you've done your research and looked at previous images of the location, it's tempting to turn up and simply head straight for the viewpoint that has been shot many times before, or perhaps scout around but settle for the first viewpoint that you find that works. But there are usually many viewpoints that you can use, taking shots that

TOP TIP

If you're struggling for a new viewpoint, trying a different format like square or panoramic can help you get a new twist on a scene

offer a fresh take on a familiar subject. Finding the right spot may be simply a matter of spending a few minutes walking around the location, trying to assess all of the possible viewpoints, and using different elements in the foreground or background. It may also be a more time-consuming process where you have to travel around a broader area

and assess several different spots. This second approach is more common if you're shooting a large feature such as a mountain or a lake, where the possible viewpoints are some distance apart. Remember that this extra time and distance may also mean that you may get to all areas in a single visit, particularly if you want to capture sunrise or a sunset.

10 laws of the land

LAW 7

DON'T RELY ON THE RULE OF THIRDS

Steer clear of rigid guidelines and learn how the landscape and your creative choices can complement each other

The classic rules of image composition are staples of all photography genres. The rule of thirds (which suggests dividing your frame into a 3x3 grid, then placing your focal point where grid lines meet) is perhaps the one most commonly applied to landscape photography. But in the real world, guidelines like this are more like handy suggestions than hard and fast rules – and if you rigidly stick to one composition, your shots can end up

looking similar and slightly boring. The other big problem with rules is that nature doesn't always follow them. The landscape in front of you may not want to fit into a nice, regular rule-of-thirds composition. The key is to allow the subject to influence the composition, rather than trying to force the subject to conform to the rule.

GO FIFTY-FIFTY

We often find ourselves placing the

TOP TIP
With wide-angle lenses, you can get some distortion when placing the horizon close to the top or bottom of the frame. Use the lens correction tools in your raw-editing software

horizon in the middle of the image, for example. Sometimes it fits there much better than on one of the thirds, particularly when shooting reflections or other symmetrical subjects. We'll also use it if we want the image to appear calm and static, reinforcing the use of long exposures or shooting in misty conditions.

At other times, we'll place the horizon much higher or lower in the frame than the classic composition rules would suggest. The position isn't set in stone, but we find an 80:20 split often works. For example, if the sky is the most interesting part of the scene we'll place the horizon so the land takes around 20 per cent of the image, and the sky 80 per cent. Alternatively, if the sky isn't that dramatic, and the foreground is the main focal point in the shot, we'll reverse the proportions so the land occupies 80 per cent of the frame.

"Allow the subject to influence the composition, rather than trying to force the subject to conform to the rule"

ON LOCATION ILE DE L'ABER, BRITTANY

- For this sunset shoot we were hoping for some cloud to appear on the horizon, but the closer the sun got to the horizon, the clearer the sky became. Instead, to make the most of the textures and colours in the foreground rocks and water, we composed images where these took up most of the frame. On some images we included some more of the sky, but we knew that we would crop these later to a squarer format, and remove most of the sky.

When the sky is clear and lacking interest, it's best to allow the landscape to dominate the frame



Placing the horizon in the middle to divide the frame in half has emphasised the calmness present in this scene



Even with a central horizon to showcase the reflection, you can position foreground objects using the rule of thirds



ON LOCATION GRAAKULA, ICELAND

● The dark mound rising up was the obvious focal point for this scene. But when we tried a shot including some foreground interest and the surrounding landscape, there were far too many things distracting attention away from the hill. So we started the process of simplifying elements.

We went to the shoreline and used the lake in the foreground, still composing the image so that the hill was the only element on the horizon. This less crowded composition is much stronger than the initial image.



Relocating from a busy hillside full of distracting detail (above) to the simpler shoreline of the lake (left) has produced a much stronger image

LAW 8

DON'T INCLUDE TOO MUCH IN THE SHOT

Remember that less is more, and you'll draw attention towards what matters most in your shot

Creating a strong, striking landscape composition is often as much about what you leave out of the frame as what you include. When you're faced with a stunning landscape, it's often difficult to decide what to exclude, so use a simple procedure to help out.

First, decide which part of the scene is essential to the composition. This is often the feature or subject that first made you stop and consider taking a shot, such as a mountain

TOP TIP

We always recommend using a tripod, but it's usually best to do hand-held shots to decide on the initial framing. Use your tripod once you've decided on the basic viewpoint

peak, a tree or even the colours in the foreground.

Using this main subject, start to include other elements, usually one at a time, to see if they will fit into the composition without detracting from the main subject. With practice, you

can do this without taking any photos, but one of the benefits of digital cameras is that you can try out different compositions, then scroll through the images on your camera's rear display to decide which ones work.

Keep checking that all of the elements of the scene work together, and that the main element you identified at the start is still what your eye is drawn to.

“Creating a striking composition is often as much about what you leave out of the frame as what you include”

10 laws of the land



Graphic subjects and overcast skies are perfect for shooting in black and white

LAW 9 DON'T THINK ONLY IN COLOUR

Learn the landscape situations that lend themselves to monochrome, and add a new twist to a favourite spot

There are two distinct weather and lighting conditions that prompt us to think in black and white. The first is a heavy, cloudy sky, which tends to produce very monochromatic results anyway. The second is when there are fluffy clouds in a bright, blue sky.

SEE FROM BOTH SIDES

These two conditions produce very different results, and also need different approaches to produce the final image. The easier is when there's blue sky, cloud and a

landscape bathed in light. Here, all you need to do is make sure that you've captured the full range of tones, and the black-and-white conversion is easy. We use a preset red filter conversion, available in Lightroom or Photoshop, to darken the blues and increase the contrast.

When shooting in heavy cloud, things are trickier. We often use an ND grad filter to darken the sky. After converting the image to black and white, you have to do a lot of dodging and burning to lighten and darken specific areas.

"There are two distinct weather and lighting conditions that prompt us to think in black and white"

ON LOCATION SUMMER FIELD, SOMERSET

- Shooting a simple field of crops during the middle of a summer's day is the exact opposite of the type of landscape that we normally shoot. But it's good to give yourself a new challenge.

With the textures and shapes in the wind-blown crops and the bright white clouds against the blue sky, we immediately thought of a black-and-white image when we found the viewpoint for this shot. To maximise the contrast between cloud and sky, we used a polariser when we took the photo. The black-and-white conversion was very simple. We used a red-filter preset in Lightroom to add even more contrast to the sky, then used the Adjustment Brush to add contrast to the crops.



In colour, this midday scene lacked the drama and detail we were looking for



Converting to black and white has emphasised the texture and tones

TOP TIP

You don't use real coloured filters when shooting in monochrome, but you can get the same effects on many cameras by selecting the filter options in the Monochrome picture style

LAW 10**DON'T BE AFRAID TO REVISIT LOCATIONS**

To get the ultimate landscape shot, keep going back and use the knowledge you've earned from your previous visits

We're always looking for new places to find insight and inspiration, but landscape photography is about more than simply ticking boxes off a checklist of locations. The way that light, seasons and weather change a scene is one of the most fundamental aspects of landscape photography. It's almost impossible to capture many of these amazing sights if you only visit a location once, then move on to the next one on your list.

TOP TIP

Returning to a location isn't only useful for areas you visit regularly. Even when we're away, we often visit a location two or three times during the stay, to get the best shot we can

We often return to locations – both close to home and in areas that we visit regularly – to learn more about how the lighting and weather combine to lend a different look to the landscape.

SAVE TIME

Returning to a location means you can spend less time researching the area, although it's still good to look out for viewpoints, compositions and subjects you might have missed. 



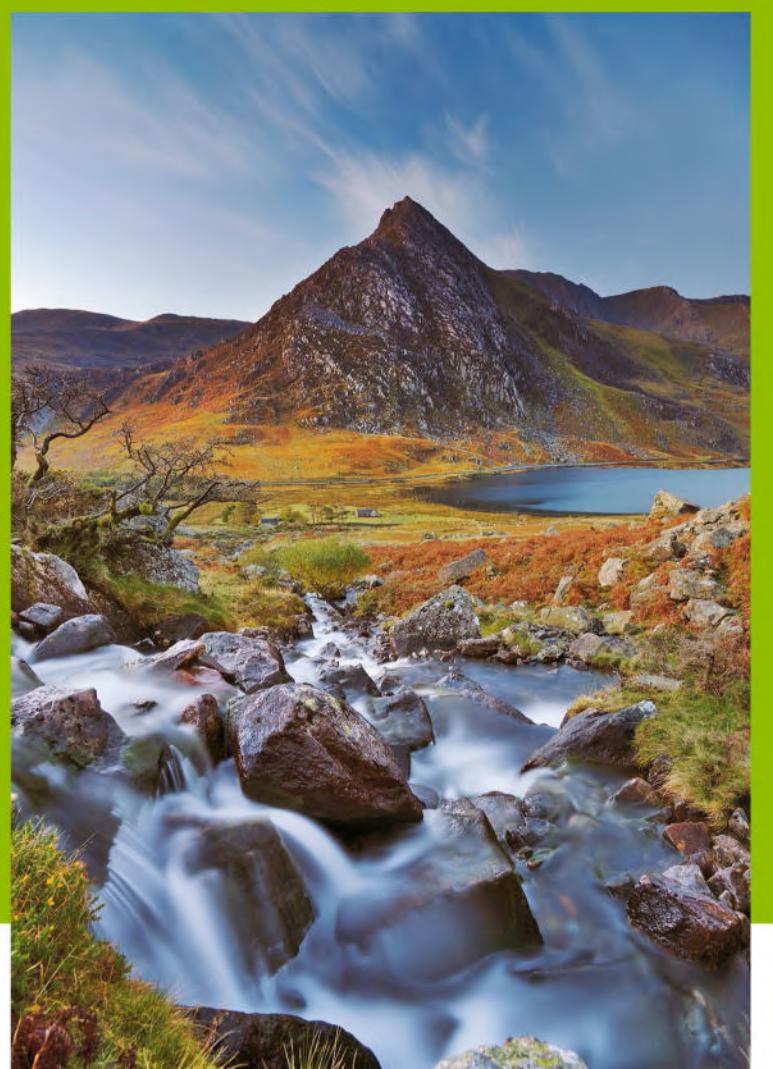
On this visit to Snowdonia, the conditions were almost perfect, with the soft light of the rising sun and some mist hanging in the valley



We've visited this spot many times, but the changes in the weather and lighting mean that no two shots have turned out the same

ON LOCATION SNOWDONIA

- We've lost count of the number of times that we've walked the same paths in North Wales to areas that we've been shooting over many years. Each time we go there's something new to discover and try to capture. We first explored this viewpoint from Pen yr Ole Wen during the day, even though we knew that it would be at its best at sunrise. In typically changeable Welsh weather, we still managed to get a few shots with a stormy sky behind the mountains. Since then, we've tried to revisit the location as often as possible, usually to catch the dawn light, and have been rewarded with many different types of weather and lighting. It's a bit like visiting an old friend: you don't know what sort of mood they are going to be in, but it's always good to see them again.



Shoot dramatic landscapes

Make the most of mood and atmosphere in your landscapes, cityscapes and seascapes

From the calm and placid conditions of a still, sunny day to the drama of a windswept storm, the weather is the driving force behind the mood and atmosphere of your landscapes and cityscapes. The character and feel can be completely transformed by different conditions, so the first considerations are the light and the weather. Finding the right conditions takes a bit of practice and perseverance, but with a little bit of effort you'll find that almost every type of weather can produce atmospheric results. So on the following pages

you'll find out how to get results in four different types of weather or lighting. While the weather, lighting and subject are key to getting atmospheric shots, nature sometimes needs a bit of help to achieve the most eye-catching results. Using filters such as ND grads can help you get more dramatic results, but there are also plenty of adjustments to make the most of the mood in your images. You'll also learn how to enhance and adjust images to create striking, eye-catching pictures in every type of weather and light.







MIST OPPORTUNITIES

Discover how to photograph the most atmospheric weather and lighting conditions

The conditions created by mist, fog and haze veiling the subject are perfect for shooting atmospheric, dreamy images. Heavy fog can obscure almost all of the landscape, so you'll need to find

strong graphic subjects such as trees or rocks, rather than the wider scenes.

This is a great opportunity to shoot simple, isolated subjects, for an almost surreal-looking landscape. These foggy conditions are most

Above Mist will often come and go, so it's worth waiting in the same position for the right light
Above right Try using a telephoto lens to shoot details
Right Heavy mist and fog can create atmospheric, eerie-looking images

common when there's a large high-pressure area, so there's very little wind to blow the fog away.

ISOLATE DETAILS

Lighter mist or fog produces a different atmosphere to thick fog, allowing you to see more of the wider landscape. You'll often find these conditions around rivers or

KEY CAMERA SETTING



EXPOSURE COMPENSATION

When a scene is covered in mist or fog, it can fool the camera into under-exposing the image, so the result looks too dark. When shooting in aperture priority mode (A or Av on your camera's mode dial), use the exposure compensation setting to make sure that the mist or fog doesn't become too dark and murky. When the fog or mist obscures much of the subject, set the exposure compensation to +1; in light mist, try +0.3 or +0.5.





lakes, where the mist will hang above the water just after sunrise.

If you can find a high viewpoint above the mist or fog, you can use a telephoto lens to isolate details in the landscape surrounded by haze. This works best in locations where the fog is confined to low-lying areas in both city and countryside. Look out for trees, tall buildings or other recognisable features to include in your shot.

LIMITED VISIBILITY

While you can predict when mist or fog is likely to occur, precise conditions can change almost by the minute. Visibility will vary: the sun or wind can make the mist disappear, while at other times it can become much more dense. You need to be prepared for these changes – both photographically and also for your own safety.

If you're in a remote spot, and the fog really sets in, the best idea is to sit it out and wait for it to clear a little, especially if you're unfamiliar with your location. But if the mist starts to clear, you may need to work quickly to find new locations or viewpoints that will give you a better view of the misty landscape.

SOFTWARE TECHNIQUE



ADD CONTRAST WITH PHOTO-EDITING SOFTWARE

Misty or foggy conditions can often create low-contrast images, no matter how carefully you choose your shooting settings. You'll need to make a few adjustments in Camera Raw or Lightroom afterwards to fine-tune your images.



1 Clarity slider

You can increase the local contrast of your misty images to restore some of the detail that's lost in these conditions. Try a setting of around 50 as a starting point, then adjust the setting to suit your image.



2 Contrast slider

To ensure mist or fog is bright, increase Contrast, then adjust Highlights and Whites until the histogram almost reaches the right. Use the Shadows and Blacks slider until the left almost reaches the end of the graph.

STORMY SKIES

Weather conditions don't get much more dramatic than storms, so they are perfect for amazing shots

Dark and angry-looking clouds, along with shafts of sunlight and amazing colours, will help to produce dramatic landscapes. But capturing this drama can be a challenge. The rain and wind at the height of the action can make it almost impossible to keep shooting, so you'll often find it easier to shoot just before, or just after, the worst of the stormy conditions.

STAY DRY

Even if you avoid shooting at the height of a storm, you're likely to have rain and wind to contend with when capturing more dramatic weather conditions. Make sure that both you and your camera kit are well protected from the elements. A rain cover will help to keep your camera dry, but you'll also need to make sure that your camera bag is waterproof to keep

the rest of your gear safe. A good waterproof coat and over-trousers will help to keep you dry enough to wait for the worst of the weather to pass.

Once the rain has disappeared, you can start to think about capturing the drama, but you'll need to work quickly. The fast-moving clouds don't keep still for long. If you're shooting early or late in the day, combine the storm clouds with the light at sunrise or sunset, and you've got the recipe for some of the most dramatic landscape conditions.



Above The dramatic clouds and sheets of rain in a heavy storm can produce amazing shots, even without including the landscape

Right Look out for bright, colourful foreground subjects to help add contrast and impact to your storm shots



KEY CAMERA SETTING



SHUTTER SPEED

The fast-moving clouds that often accompany a storm are perfect for using slow shutter speeds to add some motion blur to the sky. Clouds appear to move at different speeds depending on their distance from the camera. Faster moving foreground clouds should blur more than those on the horizon. Even when the clouds are moving quickly, you'll need to use a shutter speed of at least 15 seconds. If you're shooting during the day, use a strong or variable neutral density filter.



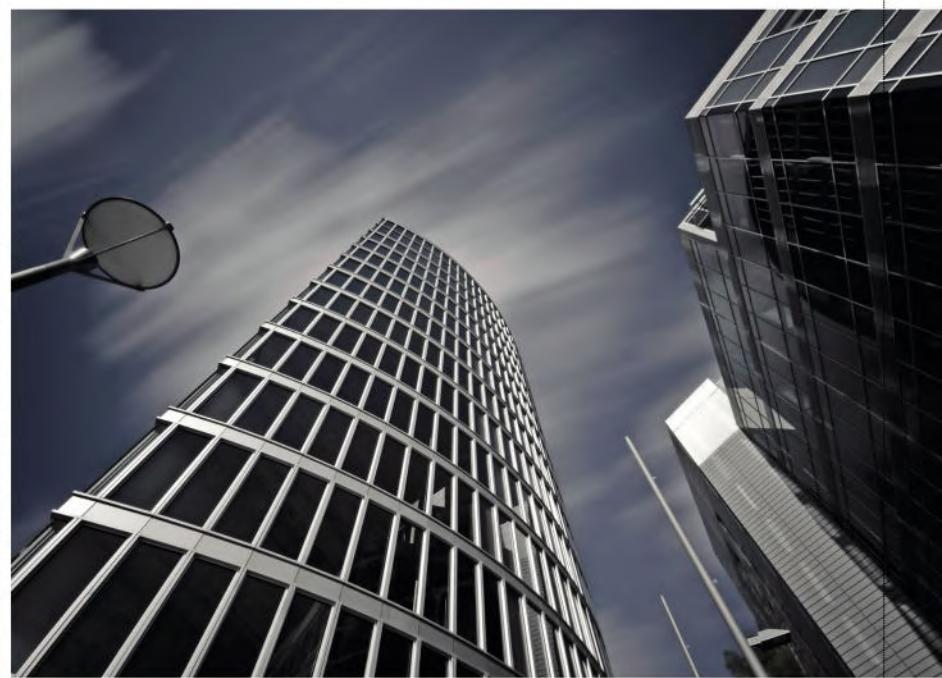
►NO ND FILTER



►WITH ND FILTER



Above The light, colours and tones created in stormy weather at sunset can produce the most amazing conditions for landscapes



Above Using a slow shutter speed to blur the fast-moving clouds that often accompany storms is a really effective way to add impact to your cityscapes and landscapes

SOFTWARE TECHNIQUE

ENHANCE COLOUR AND TONE

To make the most of the wonderful array of colours and tones created by breaks in the clouds and the different clouds themselves, you need to adjust your storm shots using the Curves and Saturation controls in Photoshop or Lightroom.



1 Tone Curve adjustments

To enhance the dramatic appearance of storm clouds, start by applying an S-Curve using the Tone Curve adjustment to add more contrast to your image. You can do this by dragging the Highlights and Lights sliders to the right, and the Darks and Shadows sliders to the left.



2 Individual colour adjustments

To make the most of the tones and colours in storm clouds, use the Saturation and Luminance controls in the HSL Adjustments panel. Using the individual colour sliders, you can darken or lighten individual colours, and also increase the saturation in the blue and aqua channels.



SUNRISE AND SUNSET

Nothing transforms your shots like great light. Here's how to capture stunning sunrise and sunset images

From the raking light of the sun low in the sky, illuminating the landscape, to the calm stillness just before sunrise or after sunset, shooting early or late in the day can transform the mood of your images compared with the rest of the day. These golden hours are a classic time to shoot landscapes and cityscapes,

Above Just after sunset or before sunrise evokes calm

and because every sunrise and sunset is different, each can create a unique mood and atmosphere in your images.

“Every sunrise and sunset is different, so each can create a unique mood in your images”

KEY CAMERA SETTING

EXPOSURE FOR SUNRISE AND SUNSET SHOTS

One of the main difficulties when shooting a sunrise or sunset is keeping detail in the brightest areas of the sky. In most cases it's best to choose an exposure that retains detail just in the brightest areas of the sky, then lighten the shadow detail when you process your raw file.

OVER-EXPOSED



CORRECTLY EXPOSED



When shooting with the sun in the frame, use a strong ND grad filter to balance the exposure. Alternatively, shoot two images – one exposed for the sky and another for the foreground – then combine the two in Photoshop.

If the sky is clear, there will be a colourful glow in the sky for around 20 to 30 minutes that creates an ethereal, soft light in the scene. You'll need a tripod, though: the light levels will be quite low, so use slow shutter speeds. This is the perfect time to capture the sky and the glow of street lamps and light trails when shooting in built-up areas.

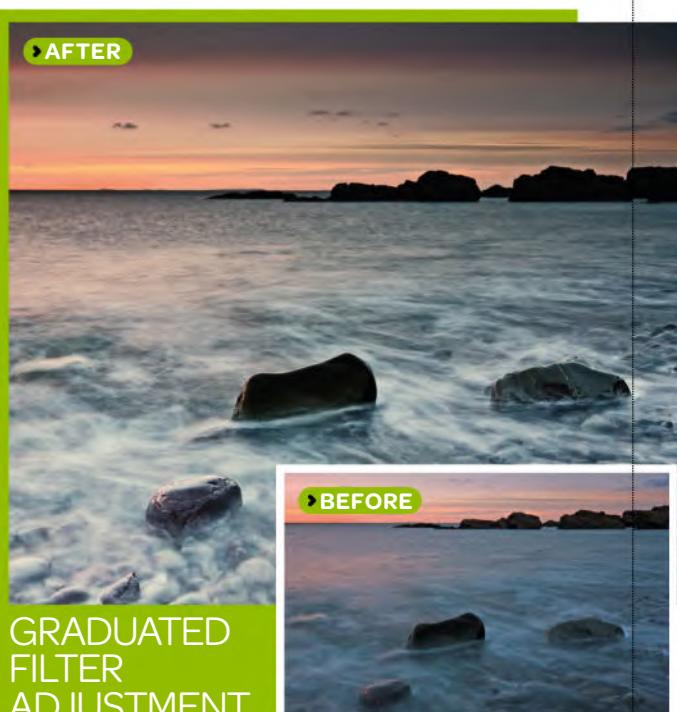
FACE AWAY FROM THE SUN

You don't always have to shoot into the sun to capture the colour and atmosphere of sunrise and sunset. As the sun gets lower in the sky, clouds in different areas of the sky become warmer and more colourful, because the light has to pass through more of the atmosphere. These areas of the sky are often much easier to capture, because they are lower in contrast than shooting into the sun.



Top Capturing the rays of light at sunrise or sunset is guaranteed to transform your landscape shots, but you'll need to use a strong ND grad to balance the exposure
Above City streets can come alive as the street lights and car headlights add light to the foreground
Left You don't have to include the sun in your sunset shots for amazing colours, so try shooting away from the sun as well

SOFTWARE TECHNIQUE



GRADUATED FILTER ADJUSTMENT

It can be hard to balance the exposure between the foreground and the sky when you shoot a sunrise or sunset, even using ND grad filters. For a balanced result, try the Graduated Filter adjustment in Lightroom 4 or later, or Camera Raw in Photoshop CS5 or later.



1 Adjust the sky

To adjust the sky with the Graduated Filter, click at the top of the frame, then drag down so the centre line of the filter is just above the horizon line. Adjust Exposure and Contrast to keep the detail in the sky.



2 Adjust the foreground

Select a new filter, click the bottom of the image and drag the cursor up until the centre of the filter adjustment is just below the horizon. Drag Exposure and Contrast to the right to finish off the foreground.

CLOUD

Don't stop shooting when it's cloudy – it just means you have a whole new range of moods to shoot

Cloudy, overcast days aren't usually the first things that spring to mind when you're thinking about great conditions for landscape photography. But as long as there's some detail and variation in the clouds, you can achieve some amazingly atmospheric and dramatic results.

The key thing to remember when you're shooting in overcast conditions is to make sure that you keep the detail in the sky without completely under-exposing the foreground. The best way to do this is to use an ND grad filter – but this is only the first step: you'll need to adjust your image later on to add impact and contrast.

When you're out shooting landscapes on overcast days, you'll notice that the landscape in the foreground will often look quite flat and lacking in contrast. There's really not much that you can do about this situation in-camera, but as long as the area contains some detail, it's very easy to increase this using selective



Above Converting your cloudy images to black and white can create successful moody images even in the cloudiest conditions

Right Try reducing the saturation of your shots, to give them an eerie, other-worldly feel

adjustments in either Camera Raw or Photoshop later on.

A classic way of shooting on cloudy days is to shoot in black and white. This removes the problems of the lack of colour and saturation caused by the overcast conditions.

By using selective adjustments, you can adjust the contrast and tone of different areas of your image, just like dodging and burning in the traditional darkroom.

ENHANCE THE MOOD

Rather than go for a completely black-and-white image, you can also enhance the mood of the overcast conditions by reducing the saturation, but keeping just a hint of the colour in your image. This lower saturation suits rocky, mountainous landscapes, complementing the rugged landscape perfectly. 



KEY CAMERA SETTING



WHITE BALANCE

Getting white balance right isn't an exact science. In fact, it's the opposite. As you'll see in the images to the right, choosing the 'correct' white balance, which actually means the colour-neutral balance, isn't always desirable. Sometimes a little more or less warmth works well.



► DAYLIGHT

Using a white balance such as daylight will shift the colours towards blue, giving a colder, starker appearance to your shots.



► CLOUD

Using the correct white balance will produce the scene's colours, but it can look less atmospheric than using the 'wrong' settings.



► SHADE

This setting will give a subtle yellow/orange tone to your image, making the scene appear a little more welcoming and warm.



Above Using a warm white balance, as well as making selective adjustments to darken the sky, can help you add drama and impact to your shots taken on cloudy, overcast days

SOFTWARE TECHNIQUE



APPLY SELECTIVE ADJUSTMENTS

You can adjust the overall contrast of an image easily, but you can also apply different adjustments to the sky and foreground to increase the impact of your shots. In this image, we first converted it to black and white before adjusting the exposure and contrast.



1 Enhance the clouds

Use the Adjustment Brush to paint over the sky area. Reduce the exposure to darken the clouds, and increase Contrast and Clarity to enhance. Fine-tune by lightening Highlights and darkening Shadows.

2 Add detail to the landscape

The foreground will often need to be lightened by selecting a new Adjustment Brush and painting over the landscape, then increasing the Exposure. You can increase Contrast and Clarity to bring out the details.

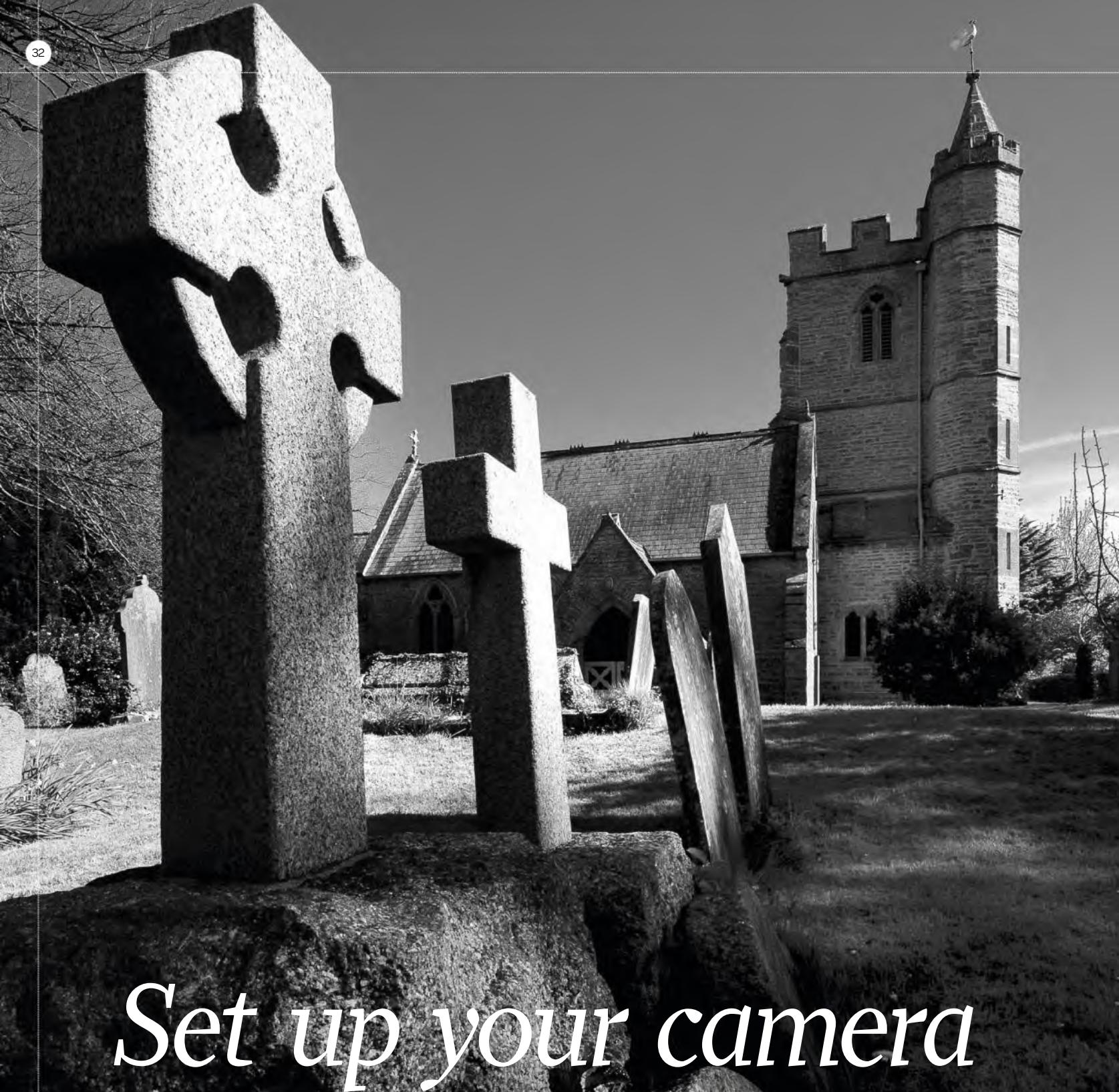


MASTER THE ART OF *Black&white*

Discover how to create beautiful monochrome images in virtually any lighting conditions

Shooting great black-and-white images isn't just about converting your images in Photoshop or Elements, it starts before you press the shutter release. Choosing the right subjects and lighting conditions is the first step, and bright sunny days can be perfect for monochrome shots. Next, it's essential to set up your camera correctly for the best results and get a better idea of how the final image will look

before you shoot. We can't promise that you can do everything to get stunning monochrome photographs in-camera, so you'll need to use some basic software techniques to improve your shots. Follow our advice through the next eight pages of this feature, and you'll get better black-and-white results and save yourself time by using the right settings and shooting techniques.



Set up your camera

Seeing the world in monochrome isn't natural. Here's how to set up your SLR to understand how removing colour will affect your images

Shooting black and white when it's bright and sunny may seem counter-intuitive, but there are plenty of reasons it's a great option. Bright sunshine creates strong shadows, which produce really striking black-and-white images. Similarly, fluffy white clouds against a blue sky can look stunning in mono. However, the high-contrast light produced by intense, direct sunshine means that you have to pay

attention to your exposure. In general, you should try to keep detail in the highlights, in the same way that you would when shooting colour images.

SHADES OF GREY

One of the trickiest aspects of shooting in black and white is understanding how the colours in the subject will translate into different shades of grey in your final image.

Selecting the monochrome Picture Style or Picture Control will give you the ability to see exactly how your shot will look.

Once you've selected the monochrome Picture Style, you can preview how the image will look by using Live View, rather than an optical viewfinder. You can also review your images in black and white to give you instant feedback for those that will work in monochrome, and those that won't.

HOW TO... SHOOT IN JPEG AND RAW

Get the best of both worlds by shooting in JPEG and raw format

Just like any Picture Style, the monochrome effect will only be permanently applied to JPEG images, not raw files. But if you open a raw file in your camera manufacturer's own raw conversion software, the image will appear in black and white, because the software will recognise that you selected it in-camera. You then have the option of whether to apply the monochrome effect.

MONO CONVERSION

If you open the raw file in different raw processing software such as Lightroom, Photoshop or Elements, the software doesn't recognise the Picture Style information. This means the image will appear in colour and you'll have to convert it manually.

In the raw interface in Elements there aren't any black-and-white conversion options, so open the image in the main editing window and convert it into black and white. In Photoshop and Lightroom you can apply a black-and-white conversion in Adobe Camera Raw. Shooting in both JPEG and raw formats gives you the best of both worlds, because the JPEG files will be black and white, while the raw files will give you the option of producing either colour or black-and-white variants.



Raw conversion

Converting this image from a raw file using the individual colour control sliders in Lightroom 4 to increase the contrast between the blue sky and the white clouds produced a more punchy result than the in-camera black-and-white settings.



In-camera JPEG

The high-contrast lighting and graphic lines of this building meant that the JPEG image using the in-camera monochrome Picture Style setting produced a good black-and-white shot straight out of the camera. So there was no need to process the raw file to get the final result.



STEP BY STEP

USE PICTURE STYLES

Shooting in monochrome mode is a great way to get a feel for how scenes will look in black and white



1 Set the Picture Style

You can set the monochrome Picture Style or Picture Control in the camera settings menu of most cameras. For your first steps in black and white, leave it on the default settings, without any filters or toning applied to the image.



2 Switch to Live View

Using Live View or an electronic viewfinder, instead of the optical viewfinder, enables you to preview the scene in black and white. This makes it much easier to get a feel for how the tones and colours in the scene will translate in mono.



3 Take a test shot

Live View can give you a good idea of how the image will look, but you'll find that taking a test shot and reviewing it on the rear LCD will often make it easier to really assess the success or failure of the image in black and white.

Choose your subject

Choosing the right subjects, lighting and shooting techniques will help you get great black and white



The key to successful black-and-white images is a combination of finding the right subjects, the right lighting and using some simple camera techniques. Let's start with how to spot subjects and scenes that will work well in monochrome.

The first step is recognising the best lighting conditions. One of the essential elements for adding impact to your images is the contrast between light and shade. Bright sunlight is perfect for creating dark shadows, which create strong lines and graphic elements for your mono shots. To make the most of the shadows, try shooting with the sun just behind the subject so that the shadows are in the foreground of your image. You don't have to stop there,

though, because you can also use these shadows as a subject in themselves. Shooting just the shadow, rather than the subject that has created it, can produce abstract and surreal black-and-white images.

TEXTURES AND TONES

As well as strong graphic elements, the more subtle appearance of textures and tones can also help to add depth and interest to mono images. Strong side lighting, on a bright, sunny day will help to bring out texture in the subject, while a softer, more diffuse light such as shooting when it's cloudy is best for capturing subtle tones.

Because you can't use colours to help the composition, black-and-white images can appear much flatter

Above Strong side lighting helps to bring out the textures, and creates dark shadows for maximum impact

and less interesting than the scene in front of you. Using the monochrome Picture Control will help you to get a good idea of how the scene will look in black and white, but remember that you can also add impact to your images by increasing the contrast. You can do this both in-camera using the contrast adjustments in the Picture Style settings, or later on in your processing software. But even the most skillful image processing isn't a substitute for good camera technique, composition and the right lighting conditions for successful shots.

"Shooting just the shadow, rather than the subject that has created it, can produce abstract images"

TOP TIP
**USING THE
HISTOGRAM DISPLAY**

When using the monochrome Picture Style, the histogram displayed on the camera is generated from the black-and-white JPEG image. So, while it's still useful for assessing the overall exposure, when you open the raw file it will display the colour histogram



Above Try shooting just the shadows created by the subject, rather than the object that created them, to produce simple, graphic black-and-white images

Above right Look for subjects with contrasting textures such as the wall, foliage and clouds in this shot to create a real sense of depth and interest to your black-and-white shots

Right In black-and-white images it's often the darkest elements that draw your attention. Here the dark figure of the fisherman on top of the sea wall is a much stronger focal point than the lighthouse

HOW TO... LEARN WHAT WORKS IN BLACK AND WHITE

You can shoot any subject in black and white, but it's not always the best option



Sunrise or sunset

You will lose much of the impact when the colours and tones are crucial to the mood of a scene, such as sunrise or sunset.



Colour contrast

Scenes that rely on strong colour contrasts such as the red poppy in this shot don't work well in mono.



Master the art of black & white

Take dramatic shots

Use simple techniques
to add contrast and
drama to your black and
white photographs

Back in the days of film, you could control the way that different colours were translated into black and white by using coloured filters in front of the lens. These traditional filters don't work with digital cameras. Instead, you can alter the contrast of your black-and-white images by using the filter effects that are available in the monochrome Picture Style menu.

FILTER EFFECTS

These filter effects give the same results as traditional filters, so they lighten areas that are the same colour as the 'filter' and darken areas of the opposite colour. For example, using a red filter effect will produce a black-and-white image where the blue areas are dark, and yellow and red areas much lighter than an unfiltered black-and-white image.

You'll find all of these filter effects in the detailed menu in the monochrome Picture Style or Picture Control settings.

"You'll find all of these filter effects in the monochrome Picture Style settings"



Above and right

Using the in-camera filter effects allows you to alter how different colours are recorded in black and white. The red filter will darken blues, which is perfect for adding contrast to the sky, while the blue filter will darken reds and yellow tones



HOW TO... USE REAL FILTERS FOR BLACK AND WHITE

Use a polariser and a neutral density grad filter for shooting in monochrome

There are two main types of filter you can use to get good monochrome results. The first is a polariser, which can help you to add contrast to skies and cut out reflections in non-metallic objects such as water. These two effects will help you to get much more punchy, high-contrast mono images in-camera.

The other filter for shooting landscapes is a neutral density grad filter. This filter, which is half dark and half clear, is perfect for reducing the contrast between the sky and the foreground.

ND grad filter

Like when shooting colour images, an ND grad filter enables you to avoid over-exposing the sky or under-exposing the foreground in your mono shots. This can save you loads of time processing and editing your shots to darken or lighten certain areas.



SUPER TIP PRESET MODES

Discover how to create your own preset black-and-white modes to achieve the effects you want



You can create custom or user-defined Picture Styles on many cameras. You normally have to access the Save/Edit controls through the shooting menu, then select the monochrome Picture Style and the filter effect you want. Some models give you the option to give this user setting a name, such as 'mono red filter' so you can easily find it among the other styles.

**TOP TIP
GET THE
INFRARED LOOK**

You can get a similar look by applying an infrared effect in software. In Photoshop CS4 or later and Elements 11, select the infrared setting from the preset options in the black-and-white conversion. You can fine-tune the effect to adjust how colours are converted



Shoot infrared

Shooting infrared will give your black-and-white photographs maximum impact

The inky black skies and high-contrast look of mono infrared is a sure-fire way to give your images impact, but you need the right conditions, and a special filter to get the best results in-camera. An infrared filter blocks out most of the visible light from entering the lens, but allows infrared light through, so it's almost impossible to see through the camera to focus, and your camera's meter will struggle to measure the infrared light accurately. This means you'll need to use a tripod and compose your shot before you fit the filter to the lens. You should then set the focus and exposure manually. Using an infrared filter will produce

odd-looking results if you shoot in colour. The image will be completely red, with no other colours, so it's much easier to predict the end result and see the effects by shooting in a monochrome Picture Style.

INFRARED FILTERS

There are several types of infrared filter, in both square and round screw-in designs. On a standard digital camera they all have a similar effect. Hoya produces the R72 in a range of sizes that screws onto the filter thread of your lens. Cokin offers the Infrared 89B for its three different systems, the A, P and Z-Pro. They shouldn't cost more than about £30.

Above Blue skies and bright, sunny days are perfect for shooting infrared black and white

The key to shooting infrared black and white is the weather conditions, because this will influence how much infrared light there will be for you to shoot. Infrared light is essentially heat, so there's much more infrared light around on a warm, sunny day than when it's overcast and cold. This means that summer is the ideal time to try infrared, especially when the sky is blue, and trees and plants have plenty of foliage. ☉

“There’s more infrared light around on a warm, sunny day than when it’s overcast and cold”



Left Shooting with an infrared filter attached to your camera requires very long shutter speeds, so you'll need to use a tripod to hold the camera steady. It will also blur movement, such as the clouds and branches in this scene

Below and bottom An infrared filter can help you to produce punchy, high-contrast images even when there are light and hazy clouds in the sky



► NO INFRARED FILTER

► WITH INFRARED FILTER



HOW TO... USE CONVERTED CAMERAS

Cameras can be converted to capture infrared images

While you can shoot infrared with your normal camera and a filter, you'll need to use a tripod to deal with the very long exposures and blacking out of the viewfinder when you put the filter in place.

There are several companies that will convert D-SLRs so that they can capture infrared images without these drawbacks. This involves removing the low-pass filter that's normally fixed in front of the sensor, and replacing this with an infrared

filter. Because you don't need to use a filter over the lens, you can operate the camera more easily. The camera will no longer be able to shoot normal images, though.

The conversion cost varies according to the camera and size of the sensor, but it starts at about £250 for an APS-C sized sensor and £350 for a full-frame model.

www.protechrepairs.co.uk



Above Converting an SLR to shoot infrared is a great way to breathe new life into an old camera if you've upgraded to a more recent model

STEP BY STEP INFRARED FILTERS

How to frame your shot, fit the filter and adjust your settings to get the perfect infrared image



1 Frame your shot

With the infrared filter over the lens it's extremely difficult to see through the viewfinder. This means that you need to put your camera on a tripod and then frame your shot before fitting the filter in place.



2 Fit the filter

Once you've fixed the camera in position, you can fit the infrared filter. If you're using one of the square filter systems, slot the filter in place without moving the camera. For a screw-in filter, you need to attach the filter carefully.



3 Set up the camera

Set the camera to manual focus, and also manual exposure mode. With the ISO set to 200, set an exposure of 10 secs at f/16. If you're shooting in bright sunlight Take a test shot and alter the shutter speed as necessary.

Learn the art of wildlife photography

Discover how to get closer to wild animals, and learn the sharp-shooting techniques you'll need to get stunning pictures once you're there

Winter is the perfect time of year to try your hand at wildlife photography. Without the cover of trees and bushes, it's easier to see wild animals and birds in their natural habitats. There's less food available too, so it's also easier to tempt them closer to your lens. And crucially, although the days are shorter, you can photograph for a much longer period than you can in the summer, because the angle of the winter sun makes for more interesting light throughout the day, with the glorious colours of sub-zero sunrises and sunsets giving your pictures an interesting edge. Cold weather

brings its own set of problems, though. For instance, metal tripods get uncomfortably cold – use padded leg wraps or switch to a carbon fibre tripod instead. Batteries also drain faster when temperatures drop. This problem is exacerbated by the use of image stabilisation, which is an essential feature on the telephoto lenses required for images of distant wildlife.

However, you don't have to spend weeks shivering behind a £10,000 telephoto monster lens in a tiny hide in order to take nature images. Follow our guide to take brilliant pictures everywhere, from your garden to your local park and beyond...



GARDEN WILDLIFE

Before you head out into the wilderness, sharpen your wildlife photography skills in your own garden – it's just as rewarding as shooting big game

You don't have to travel far to capture creative shots of wild critters. In fact, plenty of nature professionals cut their teeth on garden bird photography – and continue to make a decent income with stock shots of 'little brown jobs'.

As with other types of wildlife photography, you'll need a telephoto lens and a decent tripod to support it. Garden birds are small, and unless you can attract them close with feeders, you'll be looking at a focal length in the region of 300–500mm for frame-filling shots.

This is where the smaller APS-C sensor found in most SLRs proves advantageous. An APS-C sensor captures a smaller area of the image projected by the lens than a full-frame sensor does, so the subject appears larger in the picture. It's for this reason that you need to apply a 'focal length multiplier' of either 1.5x (for Nikon) or 1.6x (for Canon) to arrive at the effective focal length. So, a

ESSENTIAL KIT

Tripod and ball-head

For garden bird photography, choose a tripod with sturdy legs and preferably no centre column so that you can get low to the ground when necessary. A smooth ball-head will enable you to keep track of fast-moving birds too.



300mm lens on an APS-C camera gives the equivalent field of view as a 480mm lens on a full-frame camera.

BLUR BACKGROUNDS

In addition to giving you more reach, a telephoto lens gives you more control over the background. The longer the lens, the less of the background you'll see through the viewfinder. Gardens can be full of clutter, so being able to pick out a clean backdrop is absolutely essential. Also, the further that trees, hedges and fences are from the bird, the more blurred they'll appear in the image, allowing the creatures to stand out clearly. Choose a wide aperture to make the most of this effect.

As well as photographing birds on branches, get low to take shots of species that feed on the ground. Eye-level shots that feature both a distant background and foreground detail that's close to the lens work best here, allowing you to throw both out of focus with a wide aperture, sandwiching the animal between two layers of blur. Rest the lens on a beanbag to give you the necessary low angle, and get comfortable, because you might be there for some time...

The snow acts as a giant reflector in this fieldfare portrait

"Gardens can be full of clutter, so being able to pick out a clean backdrop is absolutely essential"



TOP TIP LOW-LEVEL LIVE VIEW

Cameras with tilt-and-swivel LCD screens make it easier to get low-level shots because you can activate Live View, then place the camera at ground level and angle the screen upwards

SETTING UP A FEEDING STATION



Mark Hamblin

Bring birds within reach of your lens by feeding them regularly. You can gradually move the feeders closer to your shooting location over a period of days or weeks, allowing you to shoot through an open window of your house if you wish.

Background

Find a suitable spot in your garden where you can frame the birds against a distant, distraction-free background. Spend some time seeing how the light changes in your garden through the day. This will have an impact on the best place to position your feeders and perches.

Perches

You don't have to fit your bird photography around your existing trees and shrubs. Instead, build up a collection of photogenic fallen branches that you can clamp in front of your chosen backdrop. Position a feeder out of shot and the birds will land on the artificial perch before heading to the food.

Types of food

To attract the widest range of birds, put out a broad variety of food. Be prepared to wait days or weeks for the birds to get accustomed to new feeders – just make sure you keep them topped up.



Above If your garden only attracts little brown jobs, try your local bird of prey centre for something more dramatic

Left Turn your garden into a wildlife studio with flashguns and props

NOW'S THE TIME TO GET A HIDE

Hides aren't just for the jungle – they'll get you top-class shots at home too

Setting up a hide near to your feeding station will enable you to get frame-filling shots. To get the birds used to its presence, set it up weeks before you'll use it. Poke an empty drinks bottle out of the window as a substitute lens, and gradually move the hide a little closer to the feeders each day.



Mark Hamblin

STEP BY STEP SETTING UP FOR A GARDEN SAFARI

Three ways to set up your digital SLR for wonderful wildlife photography



1 Select the right mode

Choose aperture priority mode and dial in a wide aperture such as f/5.6 or f/6.3. This will help to blur background details and give you the fastest possible shutter speed for the lighting conditions. Increase the ISO to give you a shutter speed of around 1/500 sec for bird portraits.



2 Focus carefully

If you're taking animal portraits, choose Single-Shot or One-Shot AF, and use a single AF point to focus carefully on the eyes. If you're photographing flying birds or fast-moving animals, opt for Continuous or AI Servo AF instead, because this will refocus the lens to keep the subject sharp.



3 Fire in short bursts

Use the camera's fastest drive mode to capture sequences of shots. Fire in short bursts, because this will ensure that the camera's buffer – where it stores pictures before copying them to the memory card – doesn't get filled too quickly, and the camera will always be ready for action.



ACCESSIBLE ANIMALS

If the idea of spending weeks in a cold, cramped hide gives you the chills, head to a location where you're guaranteed great shots with minimum effort

Most of us don't have the time or inclination to chase wildlife around the countryside. The good news is that there are plenty of accessible locations that present the opportunity to get close to nature (and photograph it) without having to go to extremes.

A city park, pond or nature reserve provides the perfect opportunity to, literally, stretch your legs as far as wildlife photography is concerned. The animals you'll find in well-visited locations like these will be more accustomed to people, allowing you to approach them without having to deck yourself out in camouflage.

In fact, if you're heading to your local park, ditch a long lens altogether in favour of a wide-angle or standard zoom. Squirrels frequently get close

enough to enable you to shoot environmental portraits, particularly if you're packing some unsalted peanuts as a reward.

Hold the camera close to the ground and place the food out of shot, just below the lens. Be prepared to manually select an AF point that matches up with the animal's eye, because left to its own devices, your camera may choose to focus on the closest thing to it, which is usually the animal's nose.

ICE TO MEET YOU

When temperatures plummet, visit a pond or lake for classic shots of birds skating on ice. If the frozen surface is reflecting a great deal of light, your camera is likely to under-expose the picture and make it appear too dark. Check the histogram on the rear LCD

ESSENTIAL KIT

Beanbag

It can be difficult to set up a tripod close to a public hide's narrow windows. Instead, support your lens on a beanbag on the window sill. A beanbag also provides a platform when shooting from a car. V-shaped models specifically for this purpose are available.



screen — if there's no detail on the right of the graph, dial in some positive exposure compensation (press the button marked '+/-' on your camera, and turn the main dial so that the indicator in the viewfinder moves to the '+' end of the scale).

In addition to exploring your local patch, there are many managed nature reserves and sites that bring wildlife spectacles within reach of your lens. Wildfowl & Wetlands Trust (www.wwt.org.uk) reserves are a particularly good bet during the winter months, when impressive numbers of migrating swans, geese and ducks arrive from Europe. The majority of these nine reserves have captive bird collections as well, enabling you to get close-up shots in relative comfort.



TOP TIP HIRE A SUPER-TELEPHOTO LENS

If the eye-wateringly steep price of 500mm and 600mm lenses puts you off wildlife photography, why not hire one instead? Sites like www.lensesforhire.co.uk rent a range of lenses by the week

Far left Shoot with the sun behind a bird in flight to add a glow to the edges of its wings

Left Place smaller birds off-centre in the frame to create added impact

Below For portraits, shoot at the animal's eye level

WILDLIFE HOT SPOTS

Gigrin Farm

Powys, LD6 5BL
01597 810243

Watch wild red kites being fed daily from the photographer-friendly hides.

RSPB Ham Wall

Somerset, BA6 9ST
01458 860494
Photograph the epic starling roost here.

CREATIVE TECHNIQUE

Use a slower speed to add motion blur to action shots



Danny Green

You can get great results by intentionally using a long shutter speed to blur motion. Try panning with the animal to give a sense of speed, or locking the camera on a tripod and letting birds and animals move through the frame, as photographer Danny Green did for this 0.4 sec exposure of a whirling murmuration of starlings.



Mark Hamblin

STEP BY STEP MASTERING LONG LENSES

Your quick-start guide to getting the best results from super-sized glass



1 Mount the lens

Super-telephoto lenses need to be fixed on sturdy tripods and heads. Position the tripod legs so one extends out underneath the lens, and use a sliding quick-release system to enable you to balance the load. Alternatively, consider a gimbal-style head like the one produced by Wimberley.

2 Adjust the settings

Premium lenses such as this Canon EF 500mm f/4L IS II USM have an array of buttons and switches for optimising autofocus performance. To improve AF speed and reduce hunting (where the camera doesn't lock on), there's a focus preset feature and a focus distance limiter.

3 Avoid the shakes

Press your eye against the viewfinder eyecup and rest a hand on top of the barrel. If it's an image-stabilised lens, make sure it's switched to its tripod setting, or its panning setting if you're shooting action. When you take a picture, gently roll your finger onto the shutter release rather than jabbing it.

FURTHER AFIELD

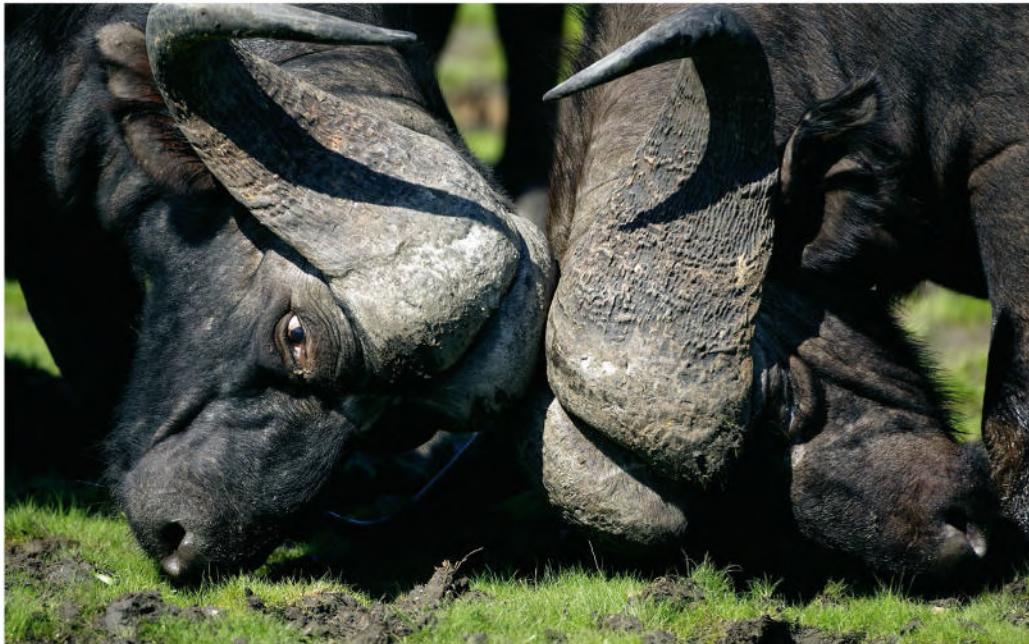
The hardest part of wildlife photography is finding a subject and getting close to it. Here's how to get prepared before you head for the hills

Once you've been bitten by the wildlife photography bug, chances are you'll want to explore further afield. It takes persistence and patience to get close to wild animals – and naturally, a long lens helps too. However, good fieldcraft and an understanding of animal behaviour make a bigger difference to successful shots than an expensive piece of glass.

Researching your subject is vital. Knowing what time of day that a species will be active, or how good its eyesight or sense of smell is, will help you to be in the right place at the right time. The internet is an essential tool in this respect, allowing you to get up-to-the-minute details on the location of winter spectacles, such as mass gatherings of wading birds at the coast, or the spectacular aerial displays of roosting starlings inland.

There are a range of approaches to getting within frame-filling distance of animals and birds in the field, but

"You'll need quiet, rustle-free clothing, ideally covered with a suitable camouflage pattern"



ESSENTIAL KIT

Teleconverter

This mounts between the lens and the camera body, and increases the effective focal length of the lens. The downside is that a converter reduces the effective maximum aperture, which results in slower shutter speeds.



perhaps the most effective is by using a hide. Talk to local landowners and farmers about the possibility of leaving one set up in a suitable spot on their land. This way it's likely to be undisturbed by the public.

DRESS DOWN

If you're planning on tracking animals on foot, kit yourself out in the right gear. A cottage industry has built up around the specific needs of wildlife photographers and filmmakers, although army surplus stores are good for the basics. You'll need quiet, rustle-free clothing, ideally covered with a suitable camouflage pattern – although this is by no means essential. Zips and popper fastenings are far preferable to noisy Velcro, and there should be enough decent-sized pockets to enable you to keep all your camera accessories with you when stalking.

Naturally, the longer your lens, the more distant you can be and still get shots with impact. You should use a monopod to support a large lens when you're stalking, because it's more manoeuvrable than a tripod – it can also be used to support you when the going gets boggy!

SHOOTING FROM A CAR WINDOW

Why you should treat your family motor like a tin hide on wheels



Mark Hamblin

Animals are often more approachable when you're in a vehicle, as illustrated by this shot of red deer taken in Scotland by wildlife pro Mark Hamblin.

Instead of trying to set up a tripod in your car, use a beanbag or door clamp to support your lens. Turn off your engine too, to prevent its vibrations from blurring the shot.

It also helps to have a passenger with you to help spot potential subjects in fields or hedgerows. Be prepared to wait for the animals to get accustomed to your presence, because they may be initially spooked when you roll up.



STEP BY STEP FIELDCRAFT MADE EASY

The key techniques to remember when you're trying to get close to wildlife



1 Blend in

Wear gloves and a hat to cover up bare skin. Avoid wearing deodorant and aftershave when you're shooting mammals, and approach them with the wind in your face so that your scent is carried away. If your lens is pale-coloured (like the one above), fit a camouflage lens cover.

2 Use natural cover

Don't walk directly towards the animal. Use a zig-zag approach, and use trees and rocks as cover. Keep a low profile to avoid breaking the skyline, because otherwise your outline will be distinctive. Make sure your camera is switched on and set up, so you don't have to fumble at the controls.

3 Carry a bag hide

Lightweight and easy to pack, a camouflaged bag hide enables you to quickly conceal yourself in the field. Simply throw one over you and your camera to break up your shape. Bag hides are loose fitting and feature a small window that you can push your lens through.

HOW TO SET UP A HIDE

Hides, or blinds as they're known in the US, come in a range of shapes, sizes and camouflage patterns to match the surroundings. Manufactured from lightweight material, standard 'pop-up' hides pack down into small bags and are easy to transport.

Good quality hides offer multiple windows, each of which is covered by scrim netting so that you can see out, but animals can't see in. The hides usually include a slit underneath the main window, which you can push a tripod leg through.



We're using a standard hide supplied by www.wildlifewatchingsupplies.co.uk. It packs down surprisingly small.

This is a freestanding model, and it fits together easily. To begin with, lay everything out on the ground and snap the poles together.

Slip the poles through the rim and you're essentially done. Add guy ropes to keep the hide fixed in place if it's particularly windy.



GO TO EXTREMES

For the ultimate photography experience, a trip to an iconic wildlife destination is hard to beat. Here's what you need to know...

The photography skills you've built up shooting local wildlife will be invaluable when you get the opportunity to travel further afield. Whether you're taking pictures of penguins in Patagonia or meerkats on the African plain, you're far more likely to create more impactful shots if you get eye-level with your subject, use wide aperture settings to soften distracting backgrounds and spend long enough observing the animals

ESSENTIAL KIT

Filters

A polarising filter will remove glare on foliage, scales and glossy fur, and boost the contrast in blue skies.



to anticipate when they'll do something interesting.

Naturally, being on the spot when the light is at its best will transform an image, but in national parks and other wildlife hot spots you'll often only be allowed access to the animals during certain periods, and this may not coincide with ideal conditions. If light levels are low, increase the ISO to give you the necessary shutter speed to prevent an animal's movement and camera shake leaving

you with fuzzy images. When faced with grey skies, compose your shots so that these aren't in the frame.

Equipment choice can often drive you mad at the best of times, but it can be a real headache when you factor in long-haul flights and other forms of transport. Travel as light as possible without leaving you short on focal length. An all-round travel kit could include a telephoto zoom in the 100-400mm range, plus a wide-angle zoom and a fast macro lens. ☺



TOP TIP TAKE A BACK-UP CAMERA BODY

Not only will you be able to carry on shooting if one breaks, but you can leave a telephoto lens on one body and a wide-angle on the other. This way, you can react faster to shooting opportunities



Above Be prepared to increase your ISO setting when shooting in low light

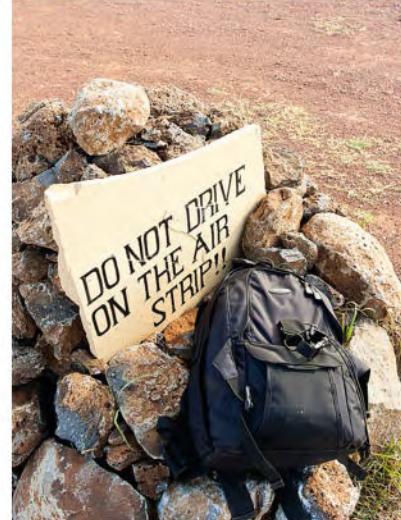
Left Shoot in short, continuous bursts to capture the action as it happens

Far left Potentially dangerous animals are best photographed with a telephoto lens

Mark Hamblin

PROTECTING YOUR GEAR

How to make sure your camera and lenses arrive in one piece



Marcus Hawkins

Take a carry-on friendly backpack to transport your gear on the plane – don't check it in, unless you want to collect a bag of smashed glass at your destination. Pack both a lens-cleaning and a sensor-cleaning kit in your carry-on luggage, and a jeweller's screwdriver set in your check-in bag, in case you need to make running repairs to your camera or lenses.

If you'll be taking photos in a humid location, take sealable plastic bags to store each piece of your equipment, along with rechargeable packs of silica gel to keep it dry and fungus-free.

STEP BY STEP TAKE CARE OF THE ESSENTIALS

For high-quality pictures, don't forget your basic training when you go travelling



1 Concentrate on composition

Although placing the subject in the middle of the frame can work well – particularly if the animal is staring down the lens – it's often more interesting to move them off-centre. For natural-looking results, leave more room in the frame for the subject to look or move into.



2 Watch the background

Faced by an exotic species, it's easy to lose sight of what's going on behind them, but the background can make or break a shot. Here, the elephant appears to have a tree growing out of its head. Raising the camera and shooting down would have provided a clean backdrop of grass.



3 Shoot in raw

If it's a once-in-a-lifetime trip, shoot in raw, not JPEG. Raw gives you more flexibility when it comes to editing your pictures later. For example, it can be tricky to expose for a dark animal in bright surroundings, and vice versa, but shooting raw enables you to fine-tune the brightness later.



Macro PROJECTS

Discover the joys of close-up photography with four easy projects to get you started...

Equipped with a macro lens, you don't need to worry about finding exotic creatures or sweeping vistas to get great photos. Look closely at the world around you and you'll find that lots of impressive images can be made from quite mundane-looking objects and places. All you need is a little inspiration and imagination to start seeing this miniature world, which is where this feature comes in. We've come up with four great macro projects for you to try, from shooting insects and other garden bugs, to creating art from objects you'll find tucked away in a drawer or cupboard.

None of these projects requires loads of expensive gear – just a lens capable of capturing tiny subjects, along with a few simple props and lighting options. The main challenge is getting used to seeing the world through the eye of a macro lens. Once you've mastered that you'll find potential subjects almost everywhere you look.



TRY FLOWER ABSTRACTS

Go beyond the normal flower or plant portrait by getting in really close to your subject to capture delicate details and unusual abstracts

With their bright colours and intricate details, flowers and plants are the perfect subject to kick-start your macro adventure. You can start by shooting classic flower ‘portraits’ like the one above, but you don’t always have to see the whole plant clearly, or even include the whole flower to get a truly striking image.

Using extremely shallow depth of field, capturing tiny details and shooting abstract close-ups offers almost endless possibilities when it comes to getting creative flower shots.

The approach you take will vary according to the type of flower that you’re going to shoot. On many

Above Wide apertures applied at close distances will make the depth of field razor thin

species such as tulips and crocuses, the stamen and stigma in the middle of the flower make the perfect focal point for your shot.

When shooting these intricate details of the flower, try filling the outside of the frame with the petals to create a wash of colour that acts as the background for your shot, then carefully focus on the most interesting part of the stamen or stigma. Shooting at a wide aperture

such as f/4 will produce very shallow depth of field when you’re this close to your subject.

A MINIMALIST APPROACH

Alternatively, you can fill the frame with just the petals to produce more abstract images. You won’t have a strong focal point, but you should still look for patterns, edges or points on the petals to focus on.

Whichever type of shot you take, you’ll need to shoot in a soft, diffuse light. Inside you can use the light from a window that’s not in direct sunlight, but if you have to shoot outside you can always use a diffuser to soften harsh sunlight.

“A wide aperture will produce very shallow depth of field when you’re this close to your subject”



Above For many types of flower, you can achieve excellent results using the stigma and stamen in the middle as the focal point of your close-up flower shots

Left Shooting just the petals of the flower, and using a wide aperture such as f/4, is a fabulous way to produce striking abstract images like this one

GETTING STARTED...



1 Keep everything still

Shooting at very high magnifications means that even the tiniest movement of either the camera or subject will result in blurred shots. You need to make sure that the subject is securely positioned, either in a small vase, or even better, clamped in position. Then place your camera on a tripod and use a remote release to help eliminate camera movement.



2 Keep the lighting soft

To capture subtle details you should use soft, diffuse lighting. A window that isn't in direct sunlight is a great starting point. If the shadows are too dark try using a diffuser between the window and the subject.



3 Focus on your subject

It's best to use manual focus when you're shooting at high magnifications. If you're struggling to focus using the viewfinder, try using Live View mode if your camera has it. Zoom in on the area that you want to be sharp.

CHEAP ALTERNATIVES TO A MACRO LENS

To get close enough to isolate small details you'll need to get much closer than any standard zoom lens will allow. The ideal solution is a dedicated macro lens, which will enable you to fill the frame with tiny subjects. But macro lenses start at £200, so they are expensive for those on a budget. Here are a couple of options that can offer you the opportunity to shoot close-ups on a tight budget.



CLOSE-UP LENSES

These look like normal filters, but are actually lenses, because they aren't simply flat glass. They screw into the front of your existing lens or fit into a square filter system. Close-up lenses are available in a range of strengths, known as dioptres, such as +1, +2 and +4, although you'll also find them simply referred to as a number – a close-up 1, for example. The higher the number, the closer it will allow the lens to focus.



EXTENSION TUBES

These allow you to shoot macro images with your existing lenses. They are hollow tubes that fit between the lens and your camera body. To keep all your camera's metering functions you need to make sure that the extension tubes have all the necessary electronic contacts. Some of the very cheap versions lack these. They usually come in a set of three tubes, which you can use individually or combine together.

GO ON A MINI SAFARI

You don't need to go to Africa to go on safari – there's a host of tiny creatures hiding in your own garden. Here's how to get great insect shots

Equipped with a macro lens you can find a host of tiny creatures in your back garden or a local wildlife reserve. But just like photographing large animals, going on a mini safari requires a bit of patience and fieldcraft to get the very best results.

The first hurdle is simply finding a subject, which can take a little perseverance and knowledge. In the UK, creatures such as butterflies and dragonflies will start to become active in late April and early May, but other creatures such as spiders, beetles and ants can be found earlier in the year. Local wildlife groups and charities are a great source of information about when and where different species can be found, and there are several specialist groups such as Buglife (www.buglife.org.uk), which can help you to learn all about different species.

WHEN TO SHOOT

Once you know where to find them, you then need a little fieldcraft to get close enough to shoot them. This isn't too difficult with slow-moving creatures, but others such as

butterflies and dragonflies will often take flight at the slightest disturbance.

You'll find it easier to shoot many of these insects early in the morning, before they have had a chance to warm up and become fully active. Many species will hide away in thick foliage during the night, making them difficult to spot. But as the temperature rises they will start to emerge. This is the prime time to get your shots, because they will need to come out into the open to get warm, and for a short time will still be too lethargic to dart off.

Even at this stage you'll need to approach the subject slowly and smoothly so that you don't scare it. One key thing is to avoid your shadow passing over the subject, which is almost sure to make it fly off.

Longer macro lenses with focal lengths of, say, 105mm or even 180mm are better for timid subjects than those with a shorter focal length



Above Using manual focus will help you to keep your subject pin-sharp

because you can fill the frame from a greater distance, and you're less likely to disturb your subject.

KEEP IT SHARP

When shooting in daylight, make sure the shutter speed is fast enough to eliminate blur from camera shake and subject movement. You'll often have to use a wide aperture, so there'll be little depth of field in your images.

Position yourself so that as much of the insect as possible is parallel to the back of your camera. Alternatively, you can use the shallow depth of field for creative effect.

“You should avoid your shadow passing over the subject, which is almost sure to make it fly off”

GETTING STARTED...



1 Fanatical fieldcraft

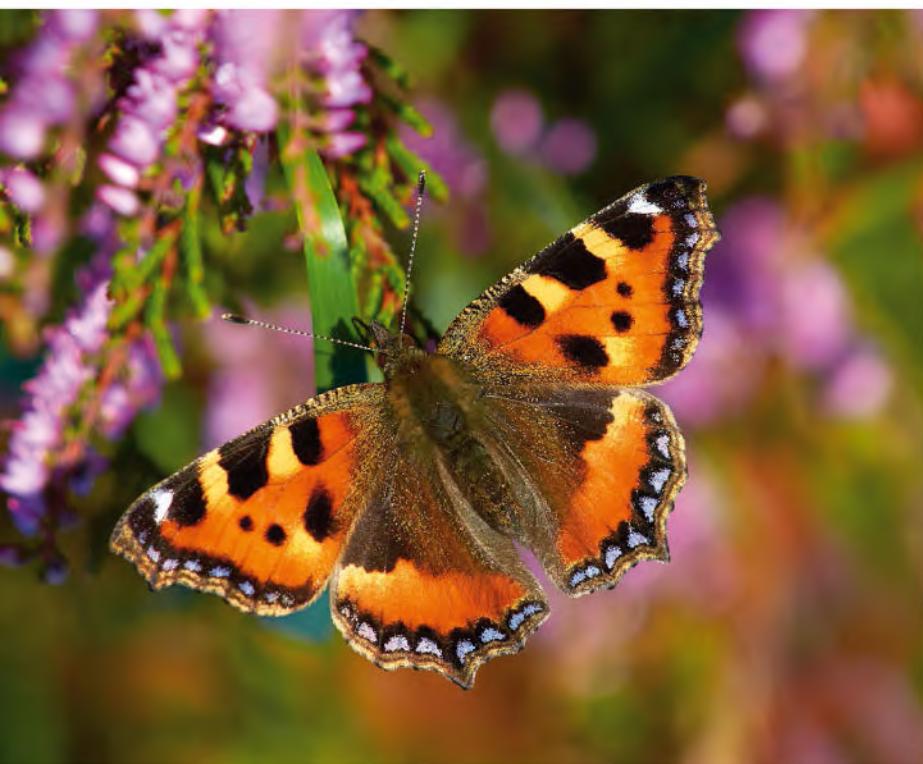
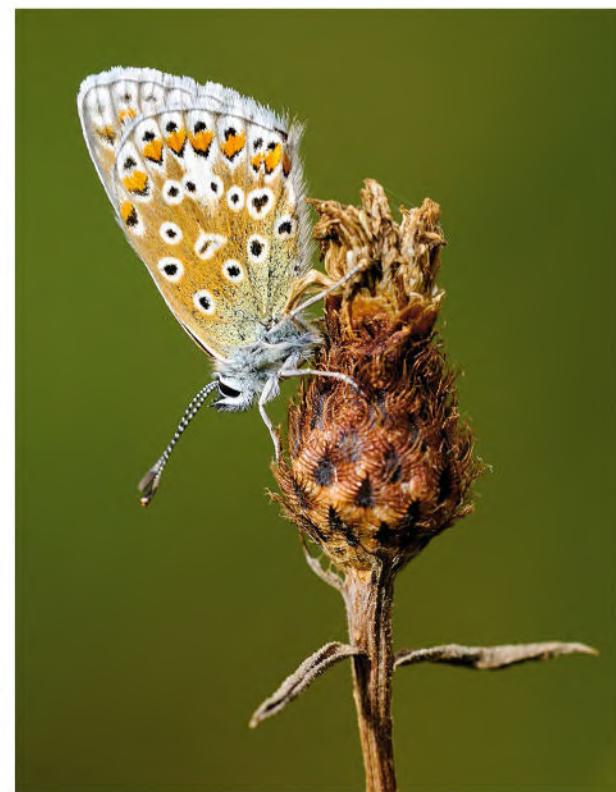
Knowing where and when to find your subjects is the first step to getting great shots of any wildlife. You need to approach your subjects slowly and gradually, and also avoid your shadow passing over them so you don't scare them off.

2 Control the aperture

To control the depth of field, set your camera to aperture priority mode, and start with an aperture of f/5.6. You can then use a wide aperture such as f/4 or f/2.8 to blur the background, but this will mean less of the insect will be sharp.

3 Focus manually

Focusing is critical. You'll get more consistent results by using manual focus, and carefully focusing on the insect's head. Keeping the main body or wings parallel to the camera will help keep more of the insect sharp, allowing you to use wider apertures.



Above As with any wildlife photography, you should focus on the head when shooting with a wide aperture

Left and top left Shooting with the body of the insect parallel to the back of the camera allows you to keep as much in focus as possible when you're using wide apertures

Bottom left Have a go at capturing some insect behaviour to give your shots additional interest

Below Break the rules and try shooting into the light to gently backlight your subject





TAKE A DROP SHOT

Here's how to go beyond the normal flower portrait by getting in very close to shoot details and abstracts

A covering of dew or water after a shower of rain can add an extra element to your plant or flower shots, but get in really close and you'll find that the droplets can also make amazing subjects on their own. Each water droplet acts like a tiny lens, creating a miniature image of the scene behind it within the droplet.

It's possible to shoot these droplets and the images inside them outdoors, but you'll need a perfectly still day and a bit of luck in order to get really great results. However, you can avoid many of the problems that are caused by the wind and weather by creating the droplets artificially in the comfort of your own home.

Before you start creating your droplets you need a subject to form the image in the water. Start off by setting up your background, remembering that it needs to be close

to the area where you're going to create the droplet. The image formed in the droplet is a bit like one created by a fisheye lens, so you'll need to make sure your background is large enough to fill the whole image formed in the droplet.

CREATE THE DROPLET

Once you've set up your background subject you need to find a stem, leaf or piece of foliage to support your droplet, and securely position it just in front of the background subject. Now you're ready to create the droplet. Rather than just plain water, try using a mixture of glucose and water, because this will create more stable droplets that are larger in size.

Carefully place the droplet in position using either a small paint brush or an eyedropper. This can take a steady hand and a few attempts to create a large enough droplet.

TAKE TWO

The best way to capture both the droplet and the image formed inside it is to take two shots. For the first shot you should focus carefully on the droplet itself. For the second you'll need to adjust the focus to a closer setting until the image in the droplet is sharp, and then take another shot.

You'll need to combine the two images you've just taken by copying and pasting the second shot of the image formed in the droplet onto the droplet itself (see the box, right). 





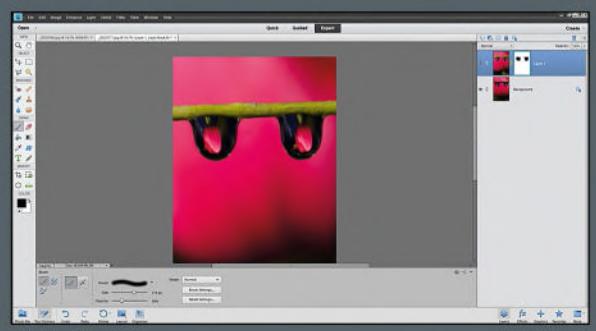
Above and left Have a go at creating a number of droplets in a row along a small stem or twig to give your shot multiple points of interest. Using a mixture of water and glucose will allow you to control the size and shape of the droplets

Above left Spraying water onto the subject to produce a similar effect to dew or rain is an effective way of adding extra texture and interest

Above right For a more abstract effect, place water drops on a piece of glass with a colourful subject behind it

TWO BECOMES ONE: COMBINE YOUR IMAGES

Open both of your images in Photoshop and copy the image where you've focused on the droplet. Paste this on to the image where the image formed in the droplet is sharp. Create a layer mask on the top layer and then select the Pen tool. With the foreground colour set to black, choose a soft-edged brush and set the Opacity to 30%. Carefully paint on the mask to reveal the sharp image in each droplet.



GETTING STARTED...



1 The background subject

To create a recognisable image in the droplet, place a simple subject 10-25cm behind the stem or leaf you're going to add your droplet to. To avoid the surroundings showing in the droplet, position a large piece of coloured card behind the subject.



2 Add your droplet

Using a mixture of glucose and water will allow you to create bigger and more cohesive droplets. For greater control over the position and size of the droplet, place it in position using an eyedropper or a very small paintbrush. It takes a steady hand and a bit of practice to create the drops.



3 Choose your settings

Set the camera to manual exposure and focus. Focus on the droplet, and use an aperture of f/11 and an appropriate shutter speed. Take a shot, then without changing any settings or moving the camera, refocus the lens so the image in the droplet is sharp, then shoot again.

THE ULTIMATE GUIDE TO ASTRO & NIGHT PHOTOGRAPHY

Discover the wonders of the night sky from shooting the moon and star trails to galaxies and nebulae and more

Main Image: Lincoln Harrison



Photography may be all about capturing light through your camera lens, but that doesn't mean you should only take pictures during the day. There's a whole new world of images to be shot long after the sun has disappeared beneath the horizon and the sky has become dark. Night-time skies reveal some of the most amazing and photogenic subjects you will ever find, such as the stars, the moon, the Milky Way and even distant galaxies.

It's always been possible to get shots after dark, but improvements to the image quality of shots taken at high ISO settings and longer exposures in cameras over the last few years mean that capturing the drama and beauty of low light and night-time is easier than ever.

To make a go of astro photography, you'll need to know where to look

and what settings to use. So we've put together a handy guide to the subjects you can shoot at night and the techniques you'll need to get the best possible results. From shooting the simplest subjects such as the moon or painting with light, to capturing the most amazing nebulae and galaxies, there's something for everyone to shoot, no matter what gear or experience you have. You will learn everything from the basic settings you will need to use to how to decide when and where you will find the best subjects.

So now's the time to get out in the dark and start shooting the hidden world of the night sky. There's no need to be afraid of the dark, but be warned: capturing these images can be a little addictive. Be prepared to lose a bit of sleep if you want to capture some of the more extreme kinds of night shot.



A GALAXY OF PHOTO IDEAS...



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LIKE NASA
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GET STARTED...

NIGHT SHOOT BASICS

Take some time to get to grips with the basics before heading out into the night. Here are our top tips...

While there are specific skills and gear needed for the different subjects you can shoot at night, as we will explain over the coming pages, many of them rely on the same basic gear, techniques and planning. Here are four things you should consider before you set out on any night photography trip.

1 Keep warm with several layers

Even during the summer, the temperature at night can drop dramatically. During a shoot, it's also common to be standing in one location for quite some time, so always take along some warm clothes, even if it's warm and bright when you set out.

A hat, gloves and a warm coat are essential, but also make sure that your shoes or boots are warm, waterproof and well insulated from the damp and cold. It's also worth taking a flask of coffee or tea.

Above Shooting after dark requires a little more planning and kit than usual, but it can produce amazing results



KIT LIST: NIGHT SHOOT BASICS

- You will need...**
- Camera
- Tripod
- A range of lenses, from wide-angle to telephoto
- Remote release
- Rucksack
- Torch
- Phone with apps

2 Watch out for condensation

As the temperature drops during the night, you'll often find that any moisture in the air will condense on any gear you have out in the open. On your tripod, bag or even the outside of the camera this can be unpleasant, but not disastrous. It's when it forms on the lens, viewfinder and rear screen that it becomes a real problem.

You can minimise the probability of condensation by giving your gear some time to gradually acclimatise, rather than taking it straight out of a warm car or house into the cold air. But on many evenings you'll still find condensation will form, so take along plenty of cloths and cleaning kit.

3 Get away from light pollution

The glow from street lights, houses and traffic can make it almost impossible to see the stars clearly, so for many night photography techniques you'll need to get away

from large towns and cities. When shooting wide views of the stars you will find that urban glow will still be visible close to the horizon, several miles from the smallest town or village. So for completely dark skies you'll need to venture out to extremely remote locations, or simply use this glow as an integral part of your image.

4 Stay safe

Going out to most locations at night isn't much more dangerous than during the day, but it pays to take a few precautions, particularly if you are going somewhere off the beaten track. If possible, take someone else along with you, or at least tell someone where you are going and when you'll be back.

Make sure that you are completely familiar with any potential dangers in the location such as uneven ground, water and even cliff edges. It's easy to forget about these hidden dangers in the darkness.

CAMERA KIT

ESSENTIAL GEAR

Don't go out without these

● Bring a tripod

Even the shortest exposures possible at night will be several seconds, so a sturdy, strong tripod is an essential accessory for any night photography. You should also make sure that the tripod is on solid ground to avoid any movement during the exposure. Check that all of the adjustments to the legs and head are firmly locked down.



● Add a remote

With the camera on a tripod you don't want to move the camera or cause camera shake by pressing the shutter release, so you'll need a remote release to ensure sharp images. This can be either a plug-in cord or a wireless version, depending on which is compatible with your camera.



● Shine a light

It goes without saying that you should take a torch along with you to help you find your way, spot any obstacles and set up your tripod and camera. But if you use a normal torch the bright light can affect your night vision for some time after you switch off the light. Using a red filter over the light will help you to retain better night vision, which is particularly important when changing settings on the camera.



Above Smartphone apps like Star Chart and SkyView can help you pick your spot on location

KEY SETTINGS

FOUR WAYS TO IMPROVE NIGHT SHOTS

Get these basics right and you're halfway there

● Focusing

Camera autofocus systems won't work at night, so you'll need to switch to manual focus. Yet with so little light around it can be difficult to find a suitable subject to focus on, even in Manual mode.



Using Live View and magnifying any areas of visible light in the frame can be easier than using the normal viewfinder to focus, and setting a high ISO of 6,400 or more can help on some cameras. To focus on subjects close to the camera, you can use a torch to illuminate them while you focus, even if you aren't going to use this to take your shot.

● Framing

Just like focusing, framing your shots through the



viewfinder can be almost impossible in the dark. Setting an extremely high ISO can allow you to see more in Live View on many cameras. Just remember to change the ISO setting back to the one that you need to take your shot, otherwise you'll get an over-exposed and extremely noisy result.

● Exposure

You won't be able to use any automatic exposure modes for night shots, or even use metering, so setting the exposure will be a mix of educated guesswork and reviewing the image to check the exposure. You will need to switch to Manual exposure mode, but the longest shutter speed on most cameras is 30 seconds.



This will be OK for many night shots, but for some effects you'll need to use

even longer exposures. To achieve this you'll need to use Bulb exposure mode, also known as B. In this mode the shutter will stay open for as long as you hold down the button on your remote release.

● White balance

The night sky doesn't match any of the 'normal' white balance settings, so getting the correct colours can be difficult, particularly if you are shooting in JPEG format. The best compromise for night shots where there are lights visible is usually a Tungsten or Incandescent preset, although you can use the Daylight preset if you are in a completely dark area. Shooting in raw format rather than JPEG allows you to fine-tune the white balance when you process your images for more accurate colours.



TRY THIS!

FIND STARS AND PLANETS

Make your way around the night sky

The art of finding stars and predicting where they (and the moon) would be in the night sky used to take lots of research and time using paper maps and charts.

These days you can find all sorts of apps and websites that will give you this information whenever and wherever you are. For planning try websites such as www.timeanddate.com

or www.in-the-sky.org, where you'll be able to predict the position of stars and moon for specific dates, times and locations.

For finding stars in the night sky you should try apps such as Star Chart or SkyView, and simply point your phone or tablet at the sky, and the stars will be displayed.



► SKYMAPONLINE.NET



► IN-THE-SKY.ORG



Chris Rutter

HOW TO SHOOT...

THE MAGNIFICENT MOON

Get started with your night photography by capturing shots of our nearest neighbour in all its glory

As the brightest and largest object in the night sky, the moon is a great subject to use as an introduction to astro photography. It's so large that you can easily shoot it with a normal telephoto lens, and it is bright enough that you can use a shutter speed fast enough to avoid needing a tracking mount. But even though the moon is relatively easy to shoot, you still need to use the right techniques to get a good shot. Here are our four suggestions...

1 Pick the right date

Start by finding out when and where the moon will be visible in the night sky, and also how much of it will be lit by the sun (the area known as the phase). You can readily find plenty of information about the times and positions of the moon's ascension and descent, along with its phases, on many meteorological websites, or use an app such as The Photographer's Ephemeris.

Above Waiting for clear conditions, choosing the right moon phase and using a 500mm lens can reveal plenty of stunning detail in the lunar surface



KIT LIST: MOON PHOTOGRAPHY

You will need...

300–600mm lens

Tripod

Remote release

Suggested settings

Shutter speed:
1/250 sec

Aperture: f/5.6

ISO: 800

2 Get your camera, lens and tripod ready

Once you've decided on a suitable time to shoot the moon, the technique is pretty straightforward. You'll need a lens of 300mm or longer to get it at a reasonable size in the frame. Fix the camera to a solid tripod, use a remote release and also select mirror lock-up mode, if your camera has this facility. The best way to focus is to use Live View, zoom in and carefully manually focus.

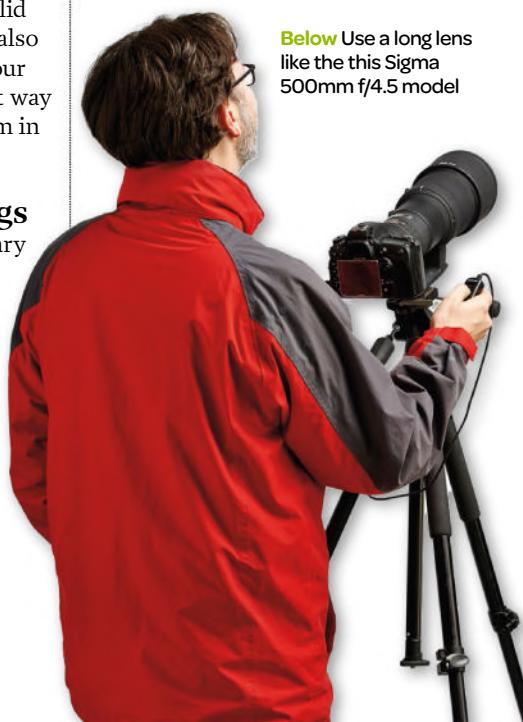
3 Choose your settings

Your exact exposure will vary according to the conditions, but in Manual exposure mode start with ISO 800, a shutter speed of 1/250 sec and an aperture of f/5.6. Adjust the ISO or aperture until you can see detail clearly in the surface of the moon. Avoid using a slower shutter speed as you tweak the settings: this will result in the moon becoming blurred.

4 Make the moon bigger

When you're deciding when to shoot the moon, it's also worth remembering that it isn't always the same distance from the earth. Its orbit is elliptical, so this distance varies at different times. When

Below Use a long lens like the this Sigma 500mm f/4.5 model





Mike Mezeul II

YOU'RE A STAR! MIKE MEZEUL II www.mikemezphotography.com

Mike stayed up for eight hours to photograph the lunar eclipse on 15th April, 2014. "I wanted to create an image that showed the entire transition over an interesting foreground," he says. "This amazing bluebonnet field in Ennis, Texas did the job. I composited the series together over the field. Due to the moon being extremely high in the sky, I moved the sequence closer to the horizon to make the composition more compelling."

Nikon D800 at 24mm; 80 sec at f/8, ISO250

there's a full moon that's closer than around 220,000 miles (360,000km) from the earth, this is known as a super moon. The difference in size and brightness between a super and a micro moon isn't huge, but even a small change can make a difference to your shots.

For detailed information about the moon, try www.timeanddate.com/moon. You'll need to fill in your location, which will then allow you

to discover all sorts of useful information. On this site you can also find out about a much rarer event, the lunar eclipse. This can be a stunning sight, as during a full lunar eclipse the moon can be transformed into a glowing red colour. During this event, the moon is much less bright than when it is illuminated by the sun, so you'll need to use a higher ISO or wider aperture. But the results can be stunning.

TRY THIS!**SHOOT LIGHTNING**

Head out in a storm for dramatic shots

While you can capture an electrical storm during the day, it's at night that the lightning becomes perfectly defined against the sky. Both for your own safety and for the best images, it's best to shoot distant storms! But lightning strikes are difficult to predict, so make sure that you have a safe place to shelter, such as a fully enclosed car or a

building, if the lightning starts to get too close. It takes a little luck to capture, but with your camera pointing at the most active area, start with an exposure of 30 seconds, f/16 at ISO 100, and keep shooting as the lightning occurs. You may also need to combine a number of shots to produce a single image of multiple strikes.



ABOVE Jamie Russell shot this in July as a line of active storms moved north off the English Channel. Nikon D5300 with Sigma 17-70mm lens at 70mm; 28 sec at f/8, ISO 200

www.islandvisions.co.uk

STEP BY STEP**PERFECT MOON SHOTS**

In three steps, you're on your way to capturing the earth's neighbour



Illustration: Andy McLaughlin

1 Choose the right kit

Once you have discovered when the moon will be visible and waited for a clear night, the moon is one of the easiest subjects to shoot in the night sky. For a close-up of the moon, use at least a 300mm lens on an APS-C model, or a 500mm lens on a full-frame.

2 Set up your camera

With the camera on a tripod and using a remote release, you need to frame up on the moon. Select manual exposure and set ISO 800, f/5.6 and 1/250 sec. In Manual Focus mode, switch to Live View and zoom in on the moon. Then carefully focus on the moon.

3 Change the settings

Take a test shot, and adjust the ISO until the surface of the moon is correctly exposed, and also check the sharpness. Remember that the moon will move quickly, so you may have to re-frame your shot.



Lincoln Harrison

HOW TO SHOOT...

Spectacular star trails

Use these straightforward techniques to capture the movement of the stars across the night sky

Traditionally, shooting star trails with film-based cameras relied on shutter speeds of minutes or even hours to capture the movement of the stars across the night sky. But these exposure times will produce too much noise on digital cameras, so

Above Lincoln Harrison shot this in Eppalock, Australia, using an 11-16mm f/2.8 lens on a Nikon D7000 SLR



KIT LIST: STAR TRAIL PHOTOS

- You will need...**
- Camera capable of 30-second shutter speed in manual mode
- Remote release with a lock
- Tripod

Suggested settings
Shutter speed:
30 seconds
Aperture: f/5.6
ISO: 400

Below A wide-angle zoom like this Sigma 10-20mm is great for star trail exposures



it's better to shoot a sequence of images using a much shorter shutter speed and combine them later on. The other big advantage with this technique is that unlike many other techniques for shooting the stars, you can get great star trails images even when there is some light pollution. Here are the three basic steps you need to follow...

1 Point the camera

Fix the camera in position, focused on the stars and ideally pointed close to the pole star. You can either use continuous shooting mode and lock the shutter release on your remote to take your images, or use an intervalometer programmed to take a sequence of images.

2 Get steady with your tripod

To capture significant trails with a wide-angle lens, you'll need to keep shooting for around 15 minutes, which will be 30 exposures of 30

seconds each. The longer you shoot for, and the more exposures you take, the longer the star trails will be in your final image.

Once you have taken your star trail images, you also need to take a dark frame. This is a shot taken using exactly the same shutter speed, ISO and aperture as your main images, but with the lens cap in place. This dark frame is used when you combine the shots together to reduce noise and the visibility of any 'hot pixels', which will produce white dots in long exposure images. For this to work successfully, this needs to be taken immediately after your main images using the same settings.

3 Combine the images

Once you have taken your sequence of images plus a dark frame, you need to combine them together to create the star trails image. You can combine the individual shots as different layers in Photoshop or Elements, then change the blending

TRY THIS!

SHOOT AN AURORA

Head out to capture a natural light show

To capture these amazing light shows, you need to find a location where the aurora is visible. These are most common close to the north and south poles. Predicting when and where the aurora will occur and also be visible is difficult. You can find forecasts from sites such as www.aurora-service.eu, www.aurora-service.net or www.gi.alaska.edu.

www.gi.alaska.edu, which will give you an overview of the expected strength and visibility.

Your choice of shooting settings will depend on the prevailing conditions, but start with an ISO of 1,600 or 3,200, a wide aperture such as f/2.8 or f/4 and a shutter speed between 10 and 30 seconds. Watch out for blurring of the lights due to movement.



Tommy Eliassen, www.tommyeliassen.com

Above Tommy Eliassen took this image in Aldersundet, Norway. "The hardest part about getting this image was finding the right location," he says. "I'm always on the look-out for a reflective surface in the foreground for my aurora images. That can be a real challenge."

Chris Rutter



Above This gorgeous shot of the sky over Glastonbury Tor is a combination of 60 images, each using a 30-second exposure

mode of all layers, apart from the bottom layer, to Lighten. Now load the dark frame on the top of the Layers stack, and change its blending mode to Difference.

This process is fine for a few images, but if you've taken 30 or more shots it's a bit boring. The easiest way to combine lots of images is to use software to automate the process. One of the most popular is Startrails for Windows, available to download in the Software section at www.startrails.de. Alternatively there is StarStaX, which is available for both Windows and Mac OS X via the Software section at www.markus-enzweiler.de.

PICTURE OF
CHRIS IN HERE
WITH KIT?
TORCH / TRIPOD?



Above For this image, Tommy Eliassen took 27 exposures of 30 seconds each, then stacked them together in Photoshop

STEP BY STEP

CAPTURE STAR TRAILS

Capture the movement of the stars in three straightforward stages



Illustration: Andy McLaughlin

1 Frame and focus

If you're shooting in the northern hemisphere, locate the pole star, so that you know the centre of the stars' rotation. The easiest way to see the subject is to set a very high ISO, and switch to Live View to allow you to compose and focus.

2 Camera settings

Once you have framed your shot, you need to switch the ISO down to 400, and set Manual exposure mode. Set the exposure to 30 seconds at f/5.6, and take a test shot to check that the stars are visible. If not, you should adjust the ISO until you can just see the stars.

3 Start shooting

If you are using a remote release, set the camera to continuous shooting, then press and lock the remote. With an intervalometer, set the interval to 30 seconds. Finally, shoot a dark frame with the same settings.



Mike Mezeul II

HOW TO SHOOT...

STUNNING STARSCAPES

Discover great techniques and tips to help you reveal breath-taking views of the galaxy

The arc of the Milky Way is one of the most dramatic and striking sights visible in the night sky at any latitude on earth. But if you live in a town, city, or anywhere affected by light pollution the first challenge is finding a location where the sky is dark enough to see it clearly. Here are four tips that can help...

1 Get to your location

This will mean getting at least an hour or so away from any major town or city. The more remote the location is, the more clearly you'll be able to see the stars.

2 Frame your shot

Next you need the sky to be clear, and also check the position of the Milky Way itself, as this varies in different locations and dates. You can find this information using a star map app, and finding the Sagittarius constellation, which is positioned in the middle of the Milky Way.

Once you've found the correct area, you need to frame and focus on the stars. Using Live View and setting a very high ISO setting can help, but it will be difficult in any dark sky site. The most reliable method is to arrive at the location before dark, set the focus on the most distant object, and plan your composition before the light disappears. You'll have to wait until at least an hour or two after sunset to start taking your images.

3 Follow the 600 rule

When shooting starscapes and the Milky Way, you need to choose a shutter speed fast enough to avoid recording too much of the movement of the stars in your shot. This will vary according to the focal length of the lens and camera that you are using. Many astro photographers use 'the 600 rule' as a rough guide to work out the shutter speed you can get away with. All you do is divide 600 by the focal length of the lens – so if you're using a 20mm

Above The more remote the location, the more the Milky Way and other stars will be visible



KIT LIST: STARSCAPES

You will need...
Camera capable of shooting ISO 1,600 to 3,200

Wide-angle, wide-aperture lens
Tripod
Remote release

Suggested settings
Shutter speed:
10 seconds
Aperture: f/2.8
ISO: 3,200

lens, 600/20 is 30 seconds. I find that using this figure produces some star trails, so I'd suggest using a figure of 300, giving a shutter speed of 15 seconds with the same lens. There will still be some movement visible at 100%

Below A wide-angle, wide-aperture lens like this 20mm f/2.8 model is ideal for starscapes



**YOU'RE A STAR!** JAMIE RUSSELL www.islandvisions.co.uk

Jamie says: "After a long spell of poor weather in early April there was a break in the rain and the skies became stunningly clear. I headed to Bembridge Windmill to capture the Milky Way arc shortly before dawn tinted the eastern sky. This is a crop of a 10-image stitch." Nikon D5300 with Tokina 11-16mm lens; 25 sec at f/2.8, ISO3200

magnification, but it's small enough for most uses.

4 Stack your images

While you can get good results from a single exposure, you can reveal even more detail by combining four or five exposures. Then you can manually combine them as different layers in Photoshop.

The stars will have moved over the course of these exposures, so you will have to carefully align the images so that stars line up. Now halve the Opacity of each layer compared with the layer below it. So on the first layer above the background, set Opacity to 50%, 25% on the layer above, 12% on the next, and so on.

If your shots include any foreground or land, these areas will now be misaligned. So you will need to add a mask to each layer, and carefully paint over the areas of the mask using a black brush where these areas appear in the top layers. Then only the landscape in the background

layer is visible. As a finishing touch, combine it with an image where you set the exposure for the landscape or foreground. Add this as a layer on the top of the layer stack, add a mask and carefully paint out the areas of sky using a black brush.



Above Wave a large torch across a foreground object to make it stand out in your starscape shot

STEP BY STEP**CAPTURE STARSCAPES**

You can shoot the Milky Way with these settings and techniques



Illustration: Andy McLaughlin

1 Set up in the dark

Find a dark-sky location where the Milky Way will be visible in the night sky; use an online star map or app to help with this. Once you're on location, you should look for a simple, graphic subject to use in the foreground of your shot, and set up your camera.

2 Shooting settings

Set the ISO to 3,200. In Manual exposure mode, select the widest aperture on your lens, such as f/2.8. Then start by setting a shutter speed of 10 seconds, which will avoid recording too much movement in the stars when using a wide-angle lens.

3 Foreground exposure

If you want to capture detail in the foreground, you will need to use a longer shutter speed, such as 30 seconds in a dark location, or use a torch to paint it with light. You will then need to combine these images.

TRY THIS!**MAKE A LIGHT PAINTING**

Add light to give your night shots impact

Using torches, lamps or flashguns to light up the landscape or foreground is a simple way to give your night shots a unique twist. There are many light-painting techniques, so you'll need to experiment with your camera settings. Once you have fixed the camera to a tripod and framed your image, try setting a 30-second

exposure at ISO 200 and f/5.6, then use your torch or flashgun to 'paint' your subject and finally close the shutter.

While this technique is relatively simple, you need to avoid illuminating one area for too long, which will cause it to be over-exposed. Move the light continuously during the exposure, using a smooth, slow action.



Chris Rutter

Above Using a torch to light the foreground is a great way to turn derelict buildings, trees or even parts of the landscape into important elements in your night shots



NASA, ESA, N. Smith (University of California, Berkeley), and The Hubble Heritage Team (STScI-AURA)

HOW TO SHOOT...

DAZZLING DEEP SKIES

Capture amazing images by shooting the beauty of distant galaxies and nebulae

Getting amazing images of objects in deep space isn't down to magnification or effective focal length: in fact, there are some very good reasons to start out at lower magnifications. It's easier to get sharp results with lower-power telescopes, and they also usually let in more light than high-powered models. The important elements in successful shots are the quality of the telescope, the smoothness of the tracking mount and accurate alignment. Here's more on the four key areas you need to consider...

1 Telescope specifications

Even though they work like lenses, you'll find that the specification of telescopes is expressed in a slightly different way to camera lenses. Most telescope model names refer to the diameter of the main lens in either millimetres or inches. You'll also often find some magnification



KIT LIST: DEEP SKY PHOTOS

You will need...
Telescope or long-telephoto, wide-aperture lens

A German equatorial mount such as HEQ5 or EQ6

Adapter and T2 mount

Suggested camera settings

Shutter speed:

2 minutes

Aperture: f/8

ISO: 800

figures: these refer to the magnification for viewing with an eyepiece fitted, so you can ignore the figures for photographic purposes. To find out how a telescope will work with your camera you'll have to dig a little deeper into the specifications and find the focal length. Sometimes this is expressed as a number such as f/500, which looks like an aperture, but is actually the focal length – just the same as the focal length as a normal lens.

The most important figure for astro photography, the effective aperture, isn't always clearly stated in the specification. But all you need to do is divide the focal length by the diameter of the objective lens. For example, a telescope with an 80mm diameter and a focal length of 600mm will have an aperture of f/10.

2 Which telescope for astro photography?

This isn't an easy one to answer, as different telescope designs have

strengths and weaknesses. If you are just starting out in astro photography and want to use an SLR with a telescope, the best option is a refractor telescope with ED or apochromatic elements.

You'll also need a mount to fix your camera to the scope. These vary according to the manufacturer, but most designs replace the eyepiece with a tube assembly, onto which you can screw an adapter called a T2 mount that enables you to attach your camera body.

3 Which tracking mount is best?

The basic motorised tracking mounts supplied with most cheaper telescopes are great for viewing the stars, but aren't accurate enough to get sharp close-ups of distant objects. For shooting with a telescope or long telephoto lens, the ideal mount is a design known as a German equatorial mount or GEM. There are many different types, but try an HEQ5

TRY THIS!

EXPLORE NASA IMAGES

Discover amazing images from the pros

Bursting with detail and colour, the images taken by NASA and other space agencies have transformed our view of the universe. While you may never get a chance to capture images as detailed as those taken by the Hubble space telescope, their images are so amazing that they are the perfect source of inspiration to take your

own astro photography to new heights.

You'll find all sorts of inspiring images of stars and nebulae in the galleries at www.jpl.nasa.gov to show you just what there is out there. You'll also be able to discover loads of information about the different missions, and useful data about phenomena such as asteroids and comets.



Above and left Get inspired by the world's greatest galactic gallery. All images courtesy NASA/JPL-Caltech

NASA

design, which starts at around £500, or an EQ6, which starts at £900.

While GEMs are accurate, they are also heavy and bulky. But there are lighter and more portable mounts for shorter-focal-length telescopes and lenses, such as the AstroTrac range and the iOptron SkyGuider. These start from around £400, and are perfect for location use.

4 Using your mount

The key to using any mount successfully is taking the time to align it perfectly. In the northern hemisphere you have to align the mount with the pole star, and also the latitude of your location.

Next you need to aim the telescope at your subject. Some mounts, often referred to as GoTo mounts, have a computerised database where you simply choose an object and the mount will automatically move the telescope to its position. Alternatively, you can use an online star map or an app to find the object, and manually position the telescope.

Now you're ready to shoot. Take several images using an exposure of one to five minutes, along with dark and light frames to help eliminate optical defects and noise. A dark frame is shot using the same settings as your main exposure, but while covering the telescope.

Finally, you can combine all of your images using Photoshop or dedicated stacking software. One of the most popular specialist programs



NASA, ESA, CXC and the University of Potsdam, JPL-Caltech, and STScI

STEP BY STEP

SHOOT DEEP SPACE

Here's how to capture distant galaxies through a telescope



Illustration: Andy McLaughlin

1 Set up your mount

Before you start, you need to precisely align your mount. In the northern hemisphere you can align it to the pole star, while in the southern hemisphere you have to use a compass to set it to the south. You also need to set your latitude for accurate tracking.

2 Find your subject

If you're using a manual telescope, you will need to use an online star map or an app to locate a subject such as the Orion Nebula. If your mount has a GoTo function, you can simply programme in the object, and the mount will find it for you.

3 Choose your settings

The precise settings will vary according to your telescope and the subject. But most deep sky images are produced by shooting many images of one to five minutes exposure, at ISO 600, over several hours.





CORE SKILLS

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MAKE THE MOST OF THE GOLDEN HOUR

There's no better time of day to take outdoor shots. We reveal how to prepare for the morning glory

The time referred to as the golden hour by photographers is that magical period just after sunrise, or before sunset, when the land is bathed in beautiful warm light. Gone are the cool tones of the middle of the day. Instead, the landscape turns shades of gold and orange.

We tend to respond more favourably towards these warm tones, which is why pictures taken during the golden hours of sunrise and sunset are so appealing. Unfortunately, this magical golden light doesn't come along every day, so you need to be ready to make best use of it.

In the morning it'll be dark when you set out, making it more difficult to find a good viewpoint. You'll also need to visualise how the shot will look once the sun comes up. All this requires careful planning if you want to shoot early-morning light at its best. Shooting later in the day means that you can find a good location and compose your shot, then wait for the sun to drop lower in the sky and paint the landscape with warmth. Images taken towards sunset benefit equally from the golden light, but may be a little harsher and lack the subtleties of early morning.

EXPERT ADVICE

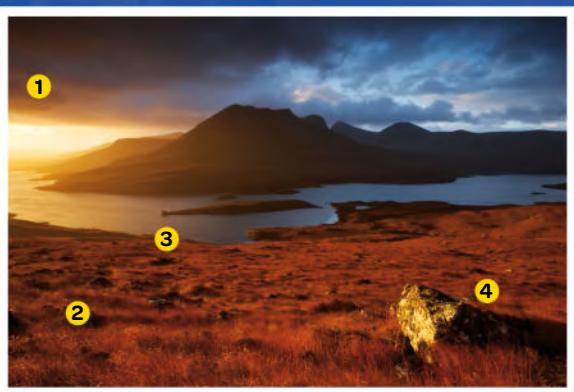
Add warmth and depth to your landscape images

**Plan your shoot**

Get up-to-date weather forecasts showing cloud cover for your location, and look for clear skies to the east or west. Give yourself plenty of time to find a good viewpoint and get set up. Take a headlight to help when walking, and for checking camera settings.

**Compose your shot**

Work out the sun's position, and compose the shot so the light will illuminate the scene from one side. Fit filters, such as ND grads, to balance the exposure or a polariser to reduce haze and unwanted reflections.

**PHOTO SCIENCE****Why this shot works**

- 1 Good research, such as previous visits to this spot, ensured that the location was well lit at first light.
- 2 Plenty of time was allowed to reach the viewpoint and get set up before the sun began to rise.
- 3 Taken soon after sunrise, the picture benefits from beautiful warm tones.
- 4 Shooting at right angles to the rising sun has produced dramatic side-lighting and deep shadows to define forms.

Take the shot

Select an exposure mode – manual (M) or aperture priority (Av) are best – and set the aperture to f/16 for good depth of field. Take a test shot and check the histogram. Adjust settings if necessary. Start shooting as the sun rises or sets, and take plenty of shots to capture the best light.

CREATIVE COMPOSITION

Break the rules of composition to add variety and interest to your wild landscape images

The old adage “Rules are there to be broken” applies as much to photographic composition as it does to many other things in life. But you need to fully understand the basic rules of composition before you can intentionally break them. Whole books have been written about the compositional ‘rules’ you should follow to create a well-balanced picture. Some of those most commonly practised include the rule of thirds, lead-in lines, natural frames, a sense of scale, use of foreground interest and a single focal point. Many successful images employ one or several of these compositional rules. However, there’s nothing to stop you throwing the rule book out of the window and creating

equally powerful images. One of the most-cited compositional rules is to imagine the frame divided into thirds, both horizontally and vertically, and then place the subject or the main focal point on one of the intersections where the imaginary lines cross. An alternative use of the rule of thirds is to apply it in a way that the viewer isn’t expecting. For example, rather than placing the subject on one of the lower thirds of the frame with space above, place it high up in the frame on one of the upper thirds. This creates an unusual balance to the scene. 



PHOTO SCIENCE

Why this shot works

- 1 The symmetrical nature of the snowy mountain lends itself extremely well to a central composition.
- 2 Breaking the conventional rule of thirds helps the shot stand out from the crowd.
- 3 The wintery conditions have vastly reduced the colour range giving the image more impact.
- 4 The flowing water in the foreground adds a real sense of movement and brings the picture to life.



EXPERT ADVICE

Don't get stuck in a rut with composition



Be creative

It's easy to revert to tried-and-tested ways of composing a shot, but sometimes it's good to try something different. Try shooting the same subject using different compositions, angles and lenses. Don't walk away until you've explored every possibility.



Compose unconventionally

Placing the subject in the centre works well with subjects that have some form of symmetry. Also, ignore the rule of thirds and place the main focal point in the extremes of the frame, with lots of empty space to add emphasis.



Change the perspective

Most people shoot from a standing position. To add interest to your images, try shooting from low perspectives to exaggerate foregrounds and height. Alternatively, shoot from an elevated position, looking down on the subject for a more abstract approach.



DOUBLE VISION

Increase the impact of your landscape images by shooting reflections

Water in its many forms is an integral part of landscape photos. One element that never fails to catch the eye is reflections: there's something magical about a reflection, transforming an ordinary scene into something special. A reflection not only adds another layer of interest to the photograph but it also introduces an element of depth.

There are many forms of reflections and many different ways to photograph them. One of the classic examples is a landscape with its reflection mirrored in tranquil water.

Early morning is usually best, but check out the weather forecast the evening before and choose a location where the water is sheltered. Smaller, shallower pools provide the best chance of ripple-free water.

Most subjects with a perfect reflection make great pictures. These might include colourful autumnal trees, mountains, or buildings. Shots taken in early morning light look fantastic when warm tones are reflected in the cooler colours of the shaded water. If you're in a new location, use a compass or phone app to work out when and where the sun will come up. ☀

**EXPERT ADVICE**

Master three techniques for sublime reflections

**Find the best light**

Use low-angled sun to capture warmly lit reflections in the cooler tones of shaded water. Avoid bright overhead sun. Use early morning mist to add interest. On overcast days, eliminate the sky and its reflection from the picture by framing tightly.

**Compose your shot**

For a perfectly symmetrical reflection, break the rules and place the horizon bang in the middle of the frame. Alternatively, place the horizon on the upper or lower third to emphasise different parts of the picture. Focusing on a rippled reflection will create an abstract image.

**PHOTO SCIENCE****Why this shot works**

- 1** Fantastic use of dramatic lighting with the shaded dark water, producing a perfect reflection of the trees.
- 2** A well-balanced composition, with the main subject and reflection having equal prominence within the frame.
- 3** The tricky lighting conditions have been handled well, using spot metering to give an accurate exposure.
- 4** A low viewpoint has ensured that the full reflection has been captured.

**Set your exposure**

Using spot metering mode, take an exposure reading from a middle-toned area of the reflection. Set this exposure in manual, or lock the exposure. Use an ND grad filter to balance the exposure. Set an aperture of f/11 or f/16 to maximize depth of field, then focus on the water.



CAPTURE LIGHT AND SHADE

Bring a full range of tones to your landscape photos using high dynamic range imaging

Capturing an image with detail in both the shadows and highlights is not always possible, especially in high-contrast lighting. This is where HDR comes to the rescue. HDR stands for high dynamic range; the technique involves blending a number of images taken at different exposure settings to produce a well-balanced final result, with detail in both the dark and bright areas of the picture.

WHY HDR?

HDR is an exciting technique because it opens up the possibility of shooting in extreme lighting situations, where ordinarily

it would be impossible to produce a worthwhile image because the shadows are blocked up or the highlights are blown out. But by exposing for the shadows, mid-tones and highlights in a series of otherwise identical shots, it's possible to take the well-exposed areas from each frame and combine them using software. The HDR effect can easily be overdone, producing unrealistic-looking images, so it needs careful handling to achieve the best results.

We'll take you through the basic steps of HDR photography and show how you can produce balanced, natural-looking images from high-contrast situations.





PHOTO SCIENCE

Why this shot works

- 1 The image was created from five images, taken at different exposures to capture a full range of tones.
- 2 Through these exposures, detail and colour have been captured in the shadows and all but the brightest highlights.
- 3 The resulting picture looks natural and doesn't suffer from the over-the-top 'HDR effect'.

HOW TO SET UP AN HDR SHOOT

A steady camera and multi-exposures are the key to success

1 Stabilise the camera

It's essential to use a tripod for this technique so that all the frames you take at different exposures line up perfectly. Set the tripod up on solid ground. Use a remote release or the two-second self-timer to ensure that the camera doesn't move between each shot.



2 Set the exposure

Determine the correct exposure for the mid-tones to use as your starting point. This can be done in either Manual or Aperture Priority metering modes. Spot metering is handy if you need to take a reading from a mid-toned area.



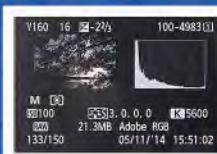
3 Bracket the exposures

To capture detail in the darkest and brightest areas take between three and seven bracketed shots, either side of the mid-tone exposure setting. This is easy to do using your camera's Auto Exposure Bracket (AEB) function. You could instead bracket the shots by adjusting the shutter speed for each shot; what's important is that the aperture remains constant.



4 Assess your images

Evaluate the darkest and brightest frames on the LCD display and check the histogram to make sure that you've captured detail in both the whites or blacks respectively at the exposure settings you used. If not, adjust the overall exposure range or the number of bracketed shots and re-take the images.



EXPERT ADVICE

The three essential steps for creating a full-range HDR image



Capture your shots

Take a series of three to seven bracketed shots at the same aperture setting using your camera's AEB mode, exposing for the shadows, mid tones and highlights separately. AEB helps you take them in quick succession to avoid ghosting of moving subjects like clouds in your final image.



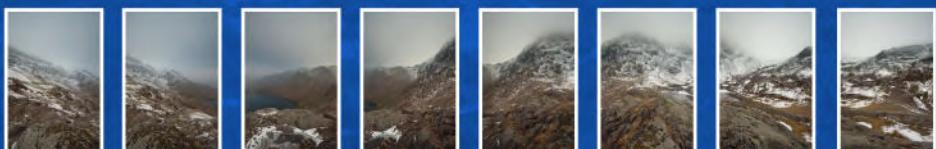
Process the images

Process each of the raw files identically. Most processing software allows you to synchronise the settings, so you can process one and then apply to the others. Export the processed files as high-resolution TIFFs or JPEGs.



Create the HDR image

Import the processed files into HDR software such as Photomatix Pro, and generate the HDR image. There may be a choice of HDR effects. Opt for the most natural you can. Your software may also allow further adjustments to the tonality, colour and contrast of the image before export.



CAPTURE THE BIG COUNTRY

We reveal how to create panoramas, from getting the images right to stitching them together

Panoramas are a great way to display vast and grandiose landscapes. Creating panoramas is also a good technique to learn if you don't own an ultra-wide lens. Using a longer lens, 50mm or so, will work better.

To demonstrate, we headed to the beautiful Snowdonia region of Wales. The mountains there present an epic scale and sumptuous level of detail that is very difficult to encapsulate in a single shot. But the vistas are ideal for turning into dramatic panoramas.

The first part of the panorama process is taking the shots. Essentially you stand still, swivel round and shoot a sequence of shots – but there's a little more to it if you want the best results. Using a tripod, take images as you move the camera around.



Allow them to overlap (about 30% is good), but try to avoid having anything important on the overlaps, or awkward shapes such as trees and plants.

Tripod selection is key with panoramas. A head that can be locked to keep the camera still, yet separately rotate on a horizontal axis will work best. Ball-head tripods will not work well in this situation, as all of the axes are changing at once.

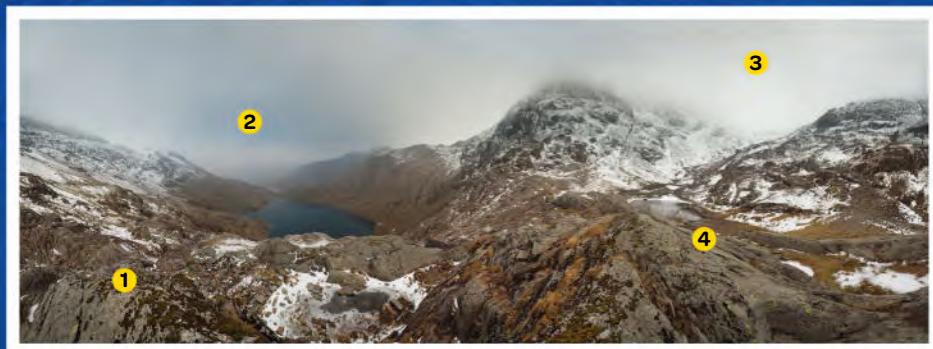
This process does not end in-camera. Stitching your images together may appear to be tricky, but Photoshop has a nifty feature to automatically piece together a panorama. This saves you the tedious task of manually fitting your frames together followed by hours of clone-stamping. Read on for more shooting and Photoshop advice...

PHOTO SCIENCE

Why this shot works

1 Don't climb to the top. The image will be more compelling with areas going both up and down, filling the frame more.

2 Using a tripod meant we could set a low ISO of 50, providing an image with little grain.
3 Having the mountain peaks submerged in cloud implies a much grander scene.
4 We used a narrow aperture of f/18 to retain a high level of detail through the landscape.



HOW TO SHOOT A PANORAMA

You'll need a locking-head tripod to achieve the best results

1 Keep it steady

To keep all your images nicely aligned, you'll need to use a tripod. A three-way head is better than a ball head, because you can lock the head to move in a single axis. Mount your camera in portrait orientation. Try to avoid wide-angle lenses as they can create distortion.



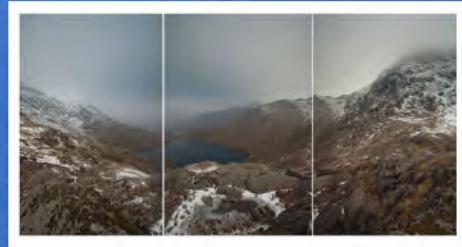
2 Even exposures

To keep your sequence of shots consistent, shoot in manual mode and with manual focus. Don't alter the settings between shots. Adjusting the aperture, ISO and even the focus as you go along could cause your images to be mismatched.



3 Positioning

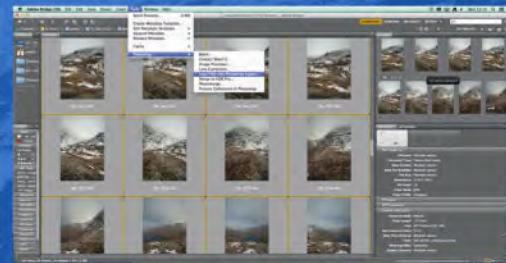
When planning the sweep of your pan, try to keep anything important or awkward – such as trees and plants – in the centre of each image. Lots of branches overlapping the frame makes stitching the shots harder. Try to overlap each shot by a third.

**4 Expose for the sky**

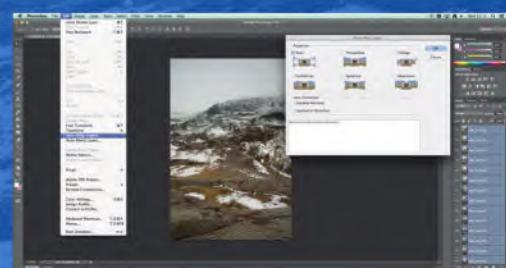
Balancing the exposure between the sky and the land is always a challenge for landscape photographers. While combining two exposures in Photoshop is one solution, it's very fiddly with panoramics. Getting it right in-camera with a neutral-density graduated filter, or ND grad, is a better solution.

**EXPERT ADVICE**

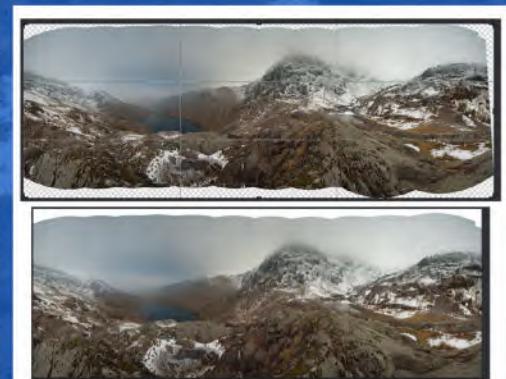
Stitch your individual shots together in Photoshop

**Opening your images**

To stitch your panorama together, pick a collection of images without any gaps in the scene and with a consistent horizon. Select all of your images in Bridge, then go to Tools>Photoshop>Load Files in Photoshop Layers. Or open your images one at a time and drag them into one document using the Move tool.

**Aligning your panorama**

Select all of the layers in the Layers panel. (Hold Shift as you click the top and bottom images.) Go to Edit>Auto-Align Layers. Select Auto in the resulting dialog box, then click OK. This will align all of your images. (It may take a few minutes.) To clean them up, select Edit>Auto-Blend Layers, choosing Panorama in the dialog.

**The finishing touches**

Your panorama is now pieced together, but with a messy border. Use the Crop tool and crop to the edge of the image. If this is too narrow, restore a thin white border. With the Clone Stamp tool, hold Alt and click a point to copy from, then paint over the white to extend the image. ☑

A SLOW-MO STATE OF MIND

Create long-exposure scenes packed with atmosphere using an ND filter

Painters and poets have been drawn to the drama of the wild seas for centuries. Today, digital photographers too can enjoy their creative possibilities, and capture stunning results. For this image, we've used a slow shutter speed, turning the wild and tempestuous ocean into a calm, milky sea of tranquillity. It's a technique that's sure to bolster your creative repertoire.

Success is all down to the shutter speed. It needs to be slow, usually seconds rather than fractions of seconds. The length of time will vary depending on the movement of the sea and clouds, so experiment.

While it's easy to achieve slow exposures on a dull day or when it's dark, it's more of a challenge in the middle of a bright day. To get round this problem, we attached a neutral-density (ND) filter to the lens. This

reduces the amount of light passing through, so you can use much slower shutter speeds.

We used a 10-stopper, which gives you 10 stops to play with. Without the filter, our exposure was 1/30 sec at f/20, which wasn't slow enough to achieve milky-looking seas. With the filter fitted, we could expose for 16 seconds. This was enough to blur the movement of the crashing waves.

Slowing down the shutter speed this much requires a steady camera, so a sturdy tripod is vital, along with locking your SLR's mirror in the up position, and using a cable release to prevent unwanted camera vibration.

While not essential, this type of shot looks particularly good when the final image is rendered as a square-cropped black-and-white image, which can be easily achieved in image-editing software such as Photoshop.

PHOTO SCIENCE

Why this shot works

- 1 Taken at the Cobb in Lyme Regis, this moody scene was a long exposure of 20 seconds, so a tripod, a cable release and locking the mirror 'up' were all vital.
- 2 In the middle of the day you'll need a neutral-density filter to block light so you can achieve a long exposure.
- 3 The image has been converted to black and white and cropped square, to add to its artistic appeal.





HOW TO SET UP A LONG EXPOSURE

You'll need a steady camera and an ND filter for the best results



2 Exposure

Switch your camera to manual mode and use a small aperture (such as f/18). This will keep most of the scene in focus and help to slow down the shutter speed.

Set a shutter speed of 20 secs and fire a test shot. Check the preview and the histogram on the rear screen. There's a lot of trial and error to capture the right amount of movement in the water: the longer the exposure, the smoother the water.

1 Stabilise the camera

A tripod is vital for long-exposure work. Extend the fattest legs first and try not to use the central column. In windy conditions, hang your camera bag from the tripod's central column for added weight and stability. Use a bungee cord to do this so that the bag just touches the ground: this way, it won't swing into the tripod legs during high gusts.

Set your lens to manual focus. Lock the camera's mirror in the up position and use a cable release to stop shutter vibration from causing camera shake.



3 Fit an ND filter

ND filters screw onto the front of your lens and stop some light from reaching the camera's sensor, enabling you to set a slow shutter speed to create a 'milky water' effect.

We used a 10-stop ND filter, which requires an exposure 10 stops longer to compensate for the filter, but you could probably use a three- or six-stop filter in low light. The filter will compromise your ability to see the scene through the viewfinder – so before you attach it, compose your scene, focus, then switch your lens to manual focus.



4 Avoid camera shake

When your SLR's shutter fires, it flips up the mirror to redirect the light entering the lens onto the sensor instead of the viewfinder, which is why the 'finder goes dark when shooting a long exposure. The movement of the mirror during this manoeuvre can cause vibrations that move the camera during the exposure, creating blur. To prevent this, set your camera to mirror lock-up mode.

Pressing the shutter release can also cause minute camera movements, so attach a remote shutter release if you have one. If you don't, use your camera's self-timer.

EXPERT ADVICE

Three simple ways to take your seascape from good to great



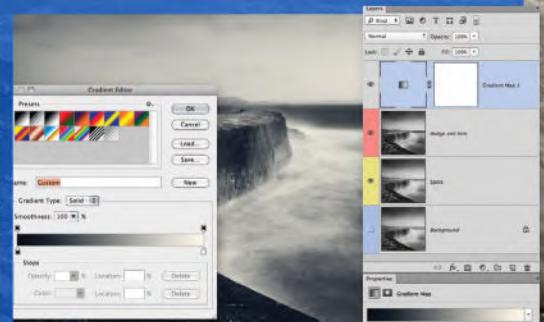
Previsualise the shot

It takes an experienced eye to visualise the final image. However, your camera's picture style settings can help. Simply set them to Mono and you'll see a black-and-white preview on the LCD screen. If you shoot in raw, you can revert to the colour file if you change your mind at a later date.



Light-seal your viewfinder

Some viewfinders aren't totally light-proof, and allow a little stray light to strike the sensor, creating patches of unwanted glare, especially during long exposures. Close your camera's eyepiece cap to prevent this glare, or improvise with tape if your camera doesn't have this facility.



Enter the digital darkroom

Open your raw file in Adobe Camera Raw or Lightroom, and convert to black and white, with a square crop for an arty look. Add a gradient to darken the sky and use the Selective Adjustment brush to lighten and darken specific parts of the image, and to balance the tones.



MAKE THE MOST OF DULL DAYS

No sun? No worries – you can still take cracking shots in uninspiring conditions

As humans we crave sunshine. It puts us in a better mood. It makes us feel good. It's only natural then that as photographers we also crave blue skies and sunshine as we strive to capture those sun-kissed cheery feelings in our images. But sunshine is not always as good a thing as you might think when it comes to shooting landscapes. In fact it can be a real problem in some situations, leading to high contrast, deep shadows, blown highlights and washed out colours. So it's just as well that the sun isn't always shining, because it

gives us the chance to shoot some sublime landscapes on dull and dreary days.

Modern digital cameras are exceptionally good at dealing with low light, and are capable of producing exquisitely detailed images in the dullest weather conditions imaginable. Of course, you have to choose your subject with care. One ingredient that arguably works better than anything else in dull weather is water. Whether as a reflective surface, flowing through a landscape, or lapping onto a beach, water gives you something to work with in a

creative sense. In dull light, when light levels are inevitably lower than on a bright day, you have the luxury of being able to shoot moving water at slow shutter speeds to create silk-like ribbons through the landscape. If dreamy waterscapes are your thing, find fast-flowing water, which might be anything from a tumbling mountain stream to waves crashing over a rocky coast. Waterfalls are also perfect for this treatment, but try to avoid any with too much white water, because this will record as a featureless empty space.



PHOTO SCIENCE

Why this shot works



- 1 The overcast conditions, stark bare trees and misty background give this image a dreamy, otherworldly feel.
- 2 The line of symmetry from the reflections of the lake runs straight through the middle of the shot, offering unfamiliar shapes.
- 3 The long exposure on a still day has made the surface of the lake like a polished mirror.
- 4 The more dense shapes of the island add a darker focal point two-thirds of the way across the shot, standing out from the grey.

EXPERT ADVICE

Three top subjects to try when the sun's hiding



Moving water

Find some fast-moving water and use a slow shutter speed to blur the flow. Fit a polarising filter to reduce some of the surface glare and add contrast, and aim for a shutter speed of around 0.5 to two seconds by setting a low ISO and narrow aperture.



Calm water

Mirror calm water is a great way to add another dimension to your shots by creating a perfect reflection of the main subject. Mornings are good for this, when there is less chance of wind. Zoom in to crop out the sky, and try placing the water level on the thirds as well as centrally.



Landscape sections

Use a short- to mid-telephoto lens to pick out smaller sections from within the landscape. By honing in on characteristic features it's possible to convey the essence of location just as effectively as a wider shot, and in many cases the results have greater impact and more appeal.



PHOTO SCIENCE

Why this shot works

- 1 Careful observation of the bird's behaviour ensured the photographer was ready to capture the action when it happened.
- 2 The shot has been perfectly timed, with both birds well positioned within the frame.
- 3 A fast shutter speed of 1/2000 sec has frozen the action, which results in the subjects appearing pin-sharp.
- 4 The exposure is absolutely spot on, thanks to a meter reading taken from the mid-toned rock in the foreground.

GET GREAT COASTAL SHOTS

Seabird 'cities' offer the perfect opportunity to improve your wildlife shooting skills

One of the greatest challenges of wildlife photography is getting close to your subject. Some dedicated enthusiasts are prepared to spend hours sitting in damp hides waiting for a bird to turn up, but for most people this isn't a very appealing prospect.

So if you want to get out there and bag yourself some top-notch wildlife shots, what are your options? Well, the answer lies in shooting approachable species, and there are few better than seabirds. Not only are they accessible, they are very appealing, and a day out at a seabird colony means that you can fill your

memory cards with action-packed images of these charismatic birds.

The nearest seabird colony may be some way from home, so plan a weekend visit when you can fully dedicate your time to photography over an extended period. A two-day window also gives you the chance to make a return visit or to allow for bad weather. When visiting a location for the first time, have a good walk around to build up a picture of what spots offer the best opportunities. The good thing with seabirds is that you can very quickly learn their habits and routines and this will help you plan ways to capture them. 



EXPERT ADVICE

Plan your seabird shoot with our mini guide



Location, location, location

The UK is one of the best locations in the world for seabird colonies. Top spots include Bempton Cliffs, The Farnes, Skomer Island, Bass Rock, Handa Island and Shetland. A visit between May and early August will provide bags of opportunities.



Go prepared

Seabird colonies are often remote places so wear warm clothes and take food and drink. Ensure batteries are fully charged, pack two camera bodies if you have them and bring a full kit from your longest telephoto to a wide-angle lens. A flash can also be handy for fill lighting.



Shoot with the light

Overcast light is great for taking close-up portraits as there is lower contrast and softer shadows. Use bright sunlight for flight shots and wider views of the colony. In very dull weather, shoot more abstract slow shutter speed pans or add some fill-flash to reveal plumage detail.

WILD PORTRAITS

Capture the magic of animals as we reveal the key techniques and settings for wildlife

Whether you're a wildlife enthusiast, own a pet or make an occasional visit to the zoo, there's no doubt that animals make great photographic subjects. And there is arguably no better way to shoot them than in glorious close-up.

Portraits not only reveal every facial feature of the animal in great detail but also show its character in a way a more distant view can never achieve. Done well, animal portraits delve right into the soul of the subject; they make an emotional connection with the viewer through compelling eye contact; and they demand attention.

First, you need to find a suitable subject – but with animals all around us in some shape or form, it shouldn't prove too difficult to find a likely candidate. The main criterion is a willing subject. You'll have to get pretty close for a good portrait, so the animal needs to be approachable – and to hang around long enough for you to bag some shots. On the whole, animals who are accustomed to people are going to make the best subjects – pets, farm animals, residents of parks and zoos and the wildlife in your garden. Of course, you can also take fantastic animal portraits in wildlife reserves

**EXPERT ADVICE**

Three steps to shooting animal portraits

**Lens choice**

Choose a subject you are able to approach quite easily, such as a pet or a tame animal. With a telephoto lens, go in close and isolate the subject from the background; alternatively move closer with a wider lens to include the surroundings.

**Lighting**

Bright overcast light provides a soft diffused light that's ideal for animal portraits, with low contrast and minimal shadows. Low warm sunlight can also produce really attractive results when the subject is lit evenly from the front. Rim-lighting is very effective for highlighting fur and whiskers.

**Composition**

Go for either a full-face portrait or a head-and-shoulders. If it's a small animal, it may be better to include the body as well. Concentrate on the eyes. Symmetrical portraits work well, but don't be afraid to try something more unusual, such as just one side of the animal's face.

Top tips...

HOW TO MAKE YOUR ANIMAL PORTRAITS ROAR

Check the background

Once you've got your shot lined up, have a good look at the background before you start shooting, to make sure it complements the subject and there aren't any distractions.

Shoot head-on

Avoid compositions where part of the body is truncated on either side of the frame, as this will look odd. Instead, compose the shot so that you're viewing the subject chest-on, as this will present a more compact profile.

Viewpoint

The golden rule is to shoot at eye level with your subject whenever possible. This will create a more intimate feel to the picture and provide better eye contact. If necessary, kneel or lie down so that your camera is level with the subject's eyes.

Stay cool

If an animal is relaxed in your presence, this will show in your pictures and you're more likely to capture its true character. Move slowly and approach the animal gradually so it remains calm.



PHOTO SCIENCE

Why this shot works

1 Good framing and a tight composition has been achieved with the help of a 300mm telephoto lens.

2 A wide aperture of f/5.6 has isolated the subject from the background – handy when they're similar colours and tones.

3 The subject is placed off-centre in the frame, and is well balanced by the tree.

4 The wildcat is looking directly at the camera, giving great eye contact. This is where the focus is at its sharpest.

and game parks, especially when you're photographing from a vehicle or a hide of some sort.

For frame-filling portraits, a telephoto lens is often the best choice. A focal length of 200mm or upwards is ideal, as this allows you to work from a reasonable distance. If you're working with your own pet or animals that allow a very close approach, it's possible to create unusual portraits with much shorter lenses or even a wide-angle. So if you have the opportunity to go in really close, it's well worth trying something a little different.

Different focal lengths will have differing effects on the background, so this is also something to bear in mind when you pick your lens. A telephoto lens will result in a blurred background, making the subject stand out well. The reverse is true of a wide-angle lens, where the background will appear more in focus. This can add another dimension to the portrait and

reveal the animal's surroundings, but it can also be a distraction if the background is cluttered.

For an effective portrait, the animal's head and face need to be the main interest, with attention firmly on the subject's eyes. Without good eye contact, the portrait won't have the same impact or appeal. Compose the shot so the animal's eyes are about one third down from the top of the frame. Showing the animal in profile may suit subjects with a strong facial shape and is a good way to emphasise features.

Soft lighting works well for portraits: it avoids dark shadows under the animal's facial features, which are often associated with harsh overhead sunlight. Thin clouds produce a diffused light that is ideal for this kind of shot, resulting in low contrast and good detail. A low sun will produce an attractive warm light, but it should ideally be coming from directly behind



Above If you can get closer to animals without making them nervous, you'll be rewarded with creative options

you to give good even illumination on the animal's face.

Backlighting is also worth trying to give an attractive rim-lit effect. A burst of fill-in flash can be helpful to brighten the face and reveal more detail. ☺



Above This shot might have been a mess of fine texture and detail, but the telephoto blurs the background nicely

APERTURE SETTINGS

Control depth of field so the key parts of the subject are sharp

When shooting an animal portrait with a telephoto lens, the most crucial setting is the aperture, which determines how much of the subject and the background will be in focus. A wide aperture of f/4 or f/5.6 provides minimal depth of field, which can be used creatively so that just the face of the animal is sharp while the background is nicely out of focus. Always focus accurately on the animal's eyes.

When you're shooting really close-up portraits, a wide aperture may not be

sufficient to record all parts of the animal's facial features in sharp focus. So to increase depth of field, set an aperture of f/8 or f/11. While you should still be focusing on the eyes, the other features will then be brought more into focus.

If you keep the composition tight on the animal for your close-up, this will logically eliminate most of the background, so that the increased depth of field won't really be noticeable in this part of the picture.

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THE LIGHT FANTASTIC

Make use of long winter nights in urban landscapes by shooting light trails

Night-time may not immediately spring to mind as a good time to go out to take pictures, but there's bags of potential for shooting after dark. In many parts of the world, we're surrounded by light all night long. And where there's light, there's a photo opportunity. One of the easiest but most effective techniques to try is capturing the light from traffic in the form of trails. The results can be spectacular, and all you need is a camera with a wide-angle zoom and a sturdy tripod to produce some really dramatic images.

Light trail photography looks complicated, but it's actually easy to master with a little

practice. The secret to producing good light trails is to keep the camera's shutter open long enough to record the vehicle lights as they pass through the frame. This is usually between 10 seconds to a couple of minutes, depending on the situation and amount of traffic. The other thing to bear in mind is the ambient light. Some natural light is a good thing and can be used very effectively – but too much and the light trails won't show up, so timing is important.

In theory, any section of road that has a regular flow of traffic at night will do the job, but of course, the better the surroundings and the composition, the better the result. ☒



PHOTO SCIENCE

Why this shot works

- 1 The dynamic composition converges light trails from all four corners into a focal point that sits on a rule-of-thirds grid.
- 2 The ISO setting for this shot was 100, keeping visual noise low while enabling a slow shutter speed to be used.
- 3 An f/14 aperture means a decent depth of field, as well as creating the attractive starburst effect in the street lights.
- 4 The exposure time of 13 seconds allows enough traffic to pass to create the trail.

**EXPERT ADVICE**

Capturing trails isn't hard with a few basic skills...

**Find a good composition**

Composition is vital, so don't just shoot any old section of road. Look for roads where the light trails will form interesting shapes and help lead the eye through the picture. Shooting from an elevated position such as a bridge can create a better perspective.

**Set a long exposure**

There are no definitive exposure settings, but aim for a shutter speed that's long enough to capture a reasonable number of trails. This will depend on how fast the traffic is moving and the length of road framed in the picture.

**Set the exposure manually**

It's best to use manual exposure mode so that you can set both the shutter speed and aperture independently. Use an aperture of around f/8 and an ISO of 200. Take a trial shot and check the LCD and histogram. If it's too dark, use a longer shutter speed or increase the ISO.

BLOOMIN' MARVELLOUS

Use an ordinary zoom lens to capture the delights of early flowers

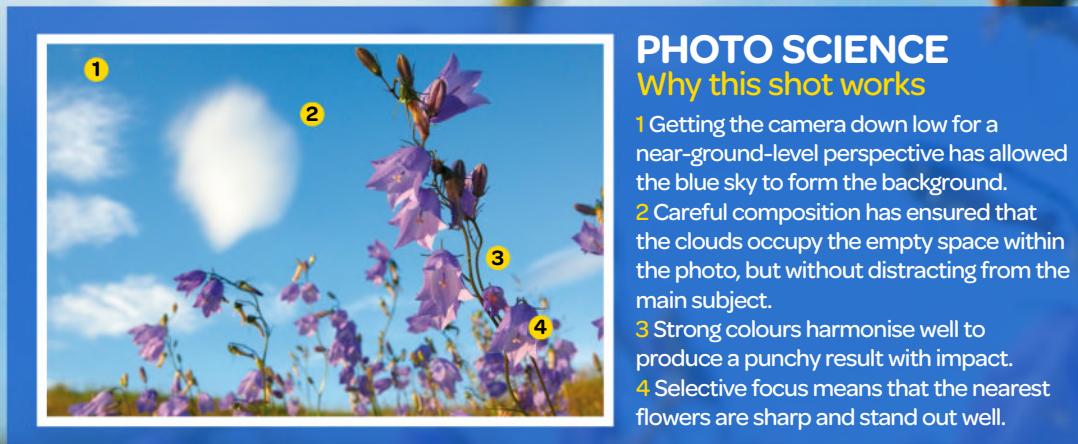
Spring heralds an explosion of new life, and brings a welcome splash of colour to the landscape. Woodlands and meadows come alive with flowers as early as February in warmer climes, and continue into summer, providing a fantastic succession of species to photograph. Chances are that you'll have little trouble finding wild flowers close to where you live, so you can pick your moment and photograph them when the weather conditions are ideal and when the flowers are looking their best. From wide views of flowers to colourful close-up abstracts, there are bags of photo opportunities to capture.

Ironically, one of the greatest challenges of flower photography is choosing the right subject to photograph. This may sound absurd when you're faced with a field full of them, but the condition of the flower and its relationship to the background are just two factors that will

influence the outcome of your images. It's easy to start shooting the first flower you come across, but try to avoid this temptation. Instead, spend some time searching for an unblemished specimen growing in the best setting.

When looking for groups of flowers to photograph, the arrangement of the flowers is also important. Choose a well-proportioned clump that you can frame without the flowers overlapping each other too much.

The approach you take to photographing these floral gems will depend on your photographic gear to some extent, but there are a wide variety of images that you can take with just a basic kit. If you want to delve into the world of macro photography, you'll either need to invest in a specialist lens that allows you to record at life size (1:1), use close-up filters that screw into the front of the lens, or attach extension rings to your zoom lens. ☺





THREE WAYS TO SHOOT FLOWERS

Follow these tips for superb floral photos



Find the right subject

Choose flowers in peak condition, growing in a good position with an uncluttered background. With care, remove any light-coloured or distracting dead bits around the subject. Hand-hold the camera to find your composition before setting up your tripod.



Look for overcast light

Aim to shoot in bright overcast light, where low contrast allows fine detail to be recorded in bright and dark areas. In bright sunshine, backlight the subject or use a diffuser to soften the light. Use fill-in flash or a reflector to bounce light into the shadows.



Vary your approach

Shoot classic portraits against a diffused background with a short telephoto. For closer views with lots of detail, set an aperture of f/16. For an abstract look, fill the frame and shoot at maximum aperture. Use a wide-angle to include the habitat.

CLOSE IN ON AUTUMN

Take advantage of nature's smorgasbord and enjoy macro photography

As autumn approaches, the cool colours of summer foliage are replaced with eye-catching yellows, reds and russet tones. Morning dew coats everything in fine droplets that sparkle in the early sunlight. Insects become lethargic and easier to approach, and late-flowering plants display their blooms. In northern climes, the first frosts add another layer of interest to leaves and berries, while in woodlands weirdly shaped fungi are emerging. There's no better time to delve into the miniature world.

An issue for some macro work is getting the entire subject in sharp focus. The answer lies partly in the correct positioning of the camera. The idea here is to align the camera so the

sensor and the subject are parallel, and therefore in the same plane of focus. A tripod is essential to allow small adjustments to be made and to focus accurately. Obviously this relies on having a static subject, but this is usually the case for most macro work.

The other principal factor that effects image sharpness is the aperture setting. As the f-stop number increases, the lens opening (aperture) decreases, which has the effect of increasing depth of field. This is great for increasing the amount of the subject that comes into focus, but it will also make the background more defined. This can be helpful when you want everything in the frame to be as sharp as possible. 

EXPERT ADVICE

Add quality to your autumn macro images

**Fine-tune focus**

Whether you're shooting at f/16 for greater depth of field or a wide aperture to create a diffused background, accurate focusing is vital. Switch to manual focusing to fine-tune the focus and make use of the magnification facility of Live View for greater precision.

**Use natural light**

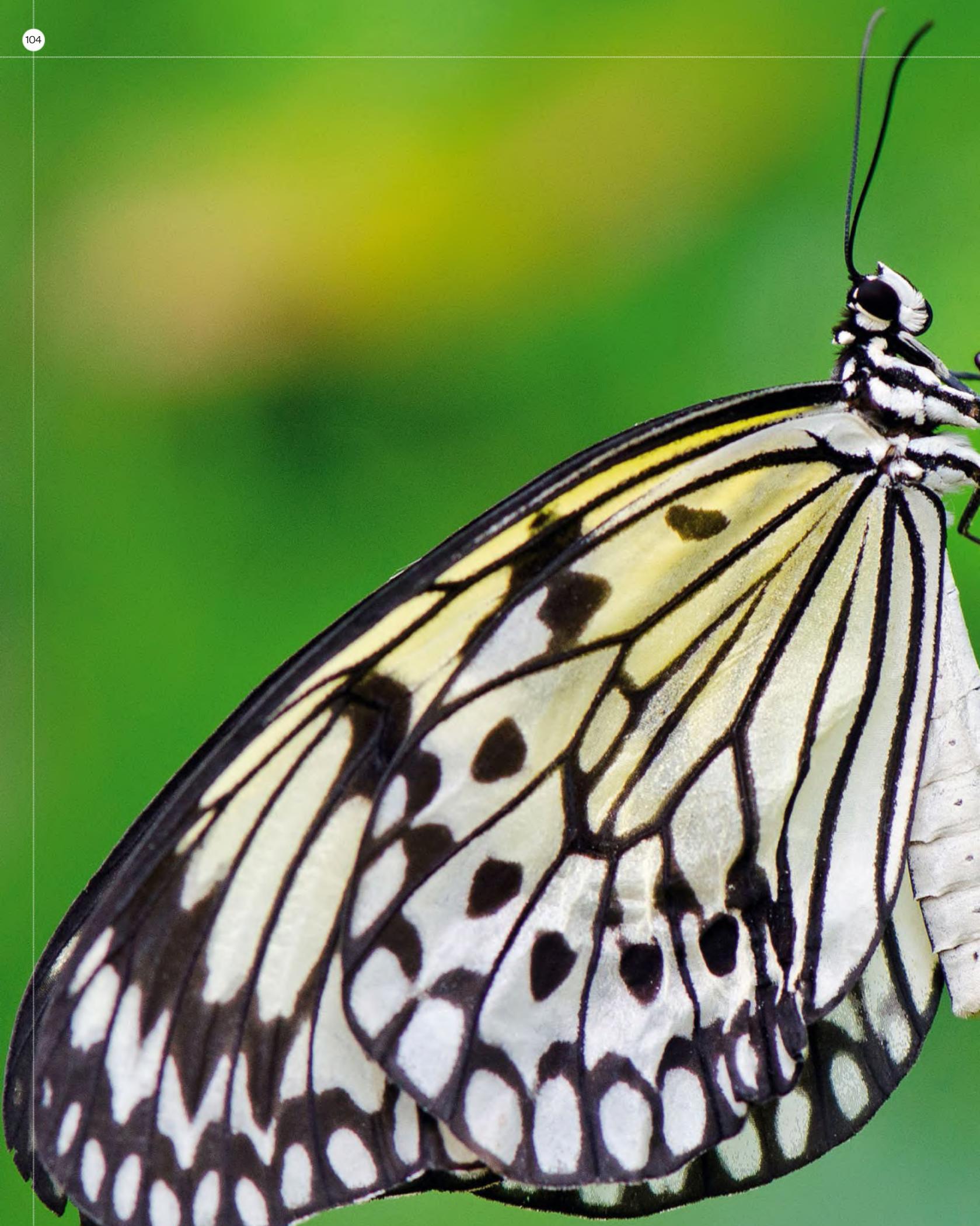
Make use of natural light. Most lighting conditions can be used effectively, but soft overcast light works well for many macro subjects. Also, try backlighting the subject for a dramatic result. A small reflector can be useful to bounce light back onto the front of the subject.

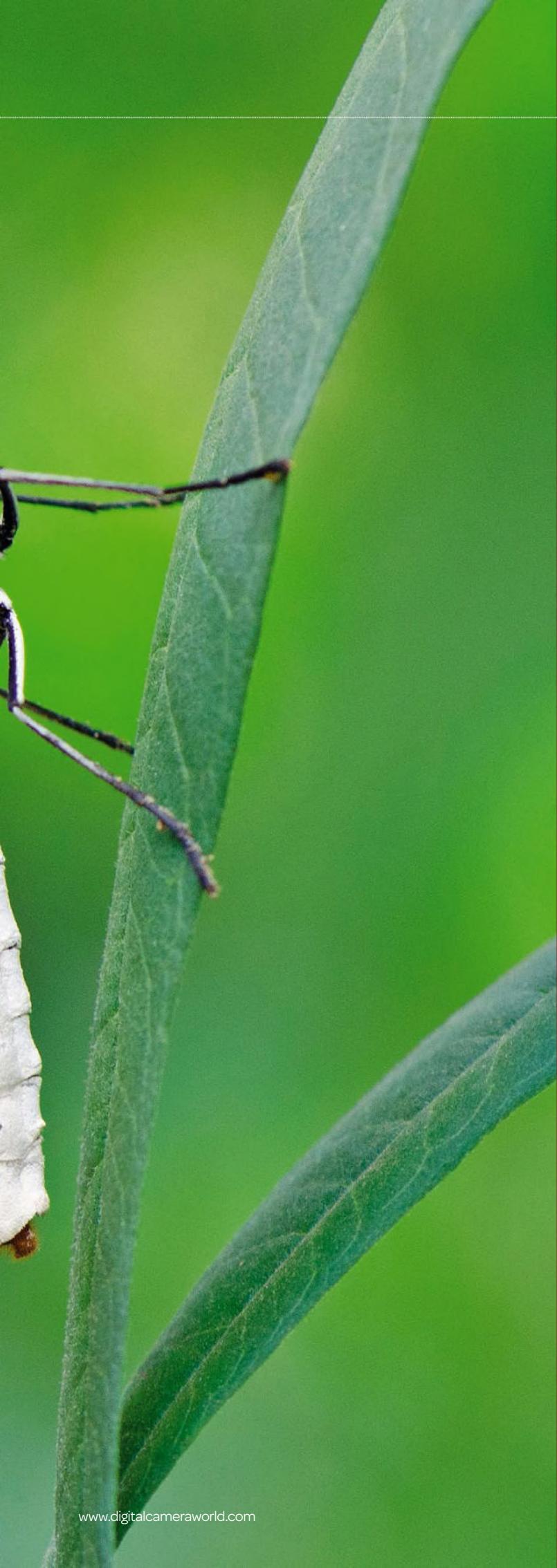
**PHOTO SCIENCE****Why this shot works**

- 1 A dedicated macro lens has been used to isolate the subject from its surroundings.
- 2 Accurate focus on the closest berry reveals some absolutely superb detail in the individual ice crystals.
- 3 A wide aperture of f/4 has resulted in a shallow depth of field to emphasise the berry at the front of the cluster.
- 4 Soft overcast light has produced an evenly lit image with bright colours and very good detail.

Isolate the subject

Keep your macro images simple by avoiding competing elements in the picture. Concentrate on the main subject, and try to isolate this from the background by shooting from a position that throws the surroundings out of focus. A longer focal-length lens helps make the subject stand out.





YOUR PHOTOS FIXED

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Landscapes... fixed!

Enthusiast Steve Lewis needs some inspiration to give his local landscapes a lift. Can we put him on the right path?



HELP ME TAKE BETTER PHOTOS CLOSE TO HOME

I've had my SLR for just over a year, and I love shooting landscapes. I find it reasonably easy to get good images in the stunning locations I've visited, such as Snowdonia or Iceland, but I struggle to find inspiration closer to home. Even though my local area is beautiful, I can't seem to capture it successfully.

Steve Lewis, Wiltshire

Location shots: Chris Rutter



A little local trouble

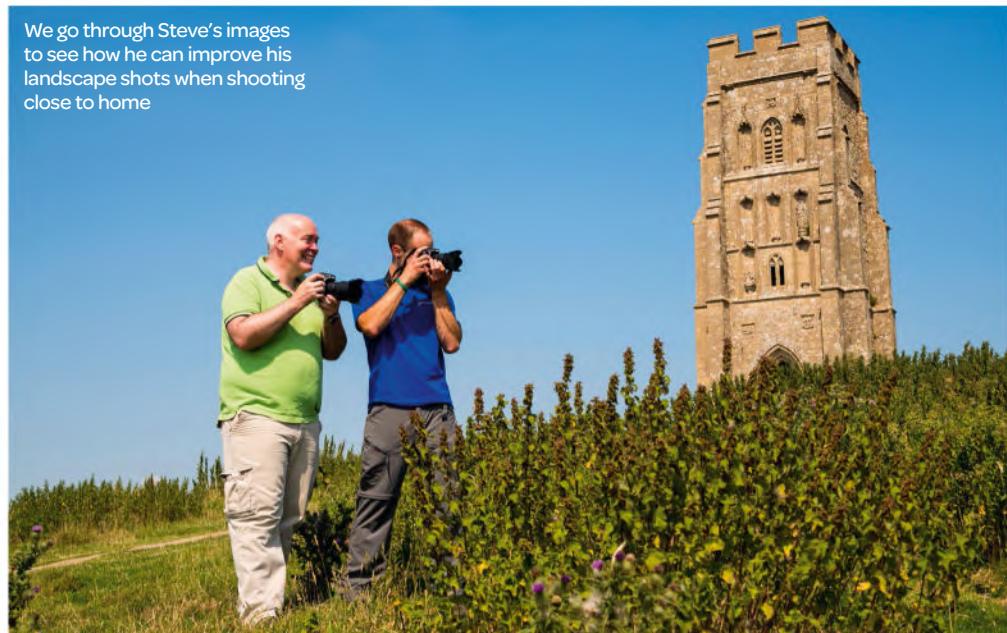
Enough though Steve has only been shooting with his SLR for just over a year, he has managed to visit some amazing locations, and get some great shots. But when the location is less spectacular, he has struggled to find the compositions to make the most of the scenery. Steve has bought a range of accessories for his Nikon D7100, including a 10-24mm

lens, a tripod and neutral-density grad filters, to help with his landscape photography, but he needs a little help when shooting closer to home. So after meeting up with Steve, we decide to visit some of the iconic locations that are reasonably close to his Wiltshire home, to explore some techniques and settings he can use to help give his landscapes a lift.

► THE DIAGNOSIS

It's all uphill for Steve

We go through Steve's images to see how he can improve his landscape shots when shooting close to home



In his first shots of the day, Steve showed a good grasp of using the landscape to create leading lines. Nearer the top, he struggled to find a good composition, and also to avoid sightseers walking around the tower



Arriving at Glastonbury Tor in Somerset, we were greeted by almost clear blue skies with the sun beating down – conditions that aren't ideal for atmospheric landscape photography. But despite the heat, we decided to start by walking up the iconic Tor to work on some simple composition tricks that Steve could use for his landscapes.

After a short, hot walk, we decided to stop around halfway up the main path – partly to give ourselves a rest, but also get started at exploring how best to shoot in these conditions. It soon became obvious that Steve had learned a lot in a short time: his first results showed that he was confident using elements of the landscape as leading lines, as well as positioning the main elements of the scene away from the centre of the frame to help his compositions.

But in spite of the less-than-ideal conditions for landscapes, Steve was keen to try improve his results. So after another short rest, we carried on up the Tor.

► SHOOTING ADVICE

Creative settings



1 See it in black and white

As well as being useful for seeing the potential of a scene in black and white, switching from colour to a Monochrome picture style or effect can also help your compositions. With the scene reduced to black and white tones, it's often easier to see the strong, graphic elements present in the scene.



2 Control the light

Exposure compensation helps you get more accurate exposures in difficult lighting conditions, but you can also use it to deliberately under- or over-expose for low or high-key results, giving your shots a completely different look and atmosphere from the usual.



3 Change the tint

You would normally select a White Balance setting to produce the most accurate colours, but you can also use it for creative effects. For example, using an indoor or incandescent preset will produce blue-toned results, which is great for emphasising cooler scenes or recreating day-to-night effects.



Using his camera's Monochrome picture style allowed Steve to capture this simple yet effective image of Glastonbury Tor

PHOTO FIX #1 Feet first

As we took the main path up the Tor, I got Steve to try some shots from a viewpoint just below the top. Just as he did with the lower viewpoints, Steve recognised the path as a leading line, and got good results. But there was a constant stream of people on the path and around the base of the tower, making it difficult to get a good composition.

I encouraged Steve to try some viewpoints away from the path, using the foliage in the foreground. This looked promising in colour, so I got Steve to choose the Monochrome Picture Control on his Nikon D7100, as well as the Red Filter option, to help him see the potential of the scene. Picking out a lone cloud in an otherwise clear sky, Steve was able to find a simple, effective composition.

**PHOTO FIX #2****Look at it from both sides**

Shooting with the sun behind him gave Steve good results (above left). But by moving round, underexposing by one stop and setting White Balance to Incandescent, Steve captured this striking image (above right)

For our second location, we went to Burnham-on-Sea to shoot the beach lighthouse. With such a strong subject and bright skies, we started with the sun behind us. By altering the position of the lighthouse in the frame and trying varied viewpoints, Steve got

a great shot. But the scene was transformed by moving to the other side and shooting into the light. By setting Exposure Compensation to -1 and changing White Balance from Daylight to Incandescent (Tungsten), he captured a completely different take on this summery scene. ☺

PHOTO FIX #3**A change of viewpoint**

Ariving at our final location in Uphill, just down the coast from Weston-super-Mare, around an hour before sunset gave Steve the chance to explore different viewpoints for his final image. We started shooting the derelict church from a small outcrop, using the fence in the foreground as a leading line; but as the sun dropped, it became obvious that there weren't enough clouds in the sky to produce the stunning sunset we had hoped for.

We decided that rather than stay put and risk including too much of the bland sky, we would move down to the fence itself. There, we could use the grasses and flowers growing on the bank just beyond the fence as

foreground interest. From this viewpoint, I encouraged Steve to frame his composition so that only a small area of the sky was visible, and to use his ND grad filter to allow him to retain the detail in both the sky and the foreground of the shot.

As the sun disappeared below the horizon, Steve was also able to reduce the shutter speed from 1/4 sec to around two seconds, which allowed him to capture some blur in the foreground as the grass was blown around by the breeze.

By simply moving his viewpoint and changing White Balance and Exposure Compensation, Steve produced two strikingly different versions of the same simple subject in Uphill



Seascapes... fixed!

Can we help enthusiast Russell Lomas develop his photographic style with seascapes?



HELP ME TO TAKE MORE CREATIVE PHOTOGRAPHS

I have a tendency to use the same camera settings, hold my camera in the same position and take similar images. I usually shoot using aperture-priority mode and let my camera sort everything else out. I need help in developing my style and taking my photography to the next level.

Russell Lomas, Tamworth

Location shots: James Paterson



► THE DIAGNOSIS

Sunshine, but no flare

Russell loves getting outdoors with his camera, so I suggested that we head to the Purbecks on the south coast. I wanted to show him how important his shutter speed setting is when it comes to landscapes, and how movement can enhance the final result. Although he hasn't owned his Sony A58 digital SLT for that long, Russell has a great knowledge of how his camera works, and also understands exposure. He

usually shoots in aperture-priority mode, but I suggested that we shoot in manual and take full control over his camera's settings.

Russell hasn't used filters before, so I thought it'd be a good opportunity to show him how they can enhance the final result. I had some ND stoppers and ND grads to help him out. I also brought along a sturdy tripod, as you want to be sure your equipment is safe when shooting seascapes.



PHOTO FIX #1

Taking a creative approach

As I explained to Russell, one of the hardest things when it comes to the landscape genre is working out your composition. The trick is to have a good look around before you even get your camera out of the bag.

Our first location was Kimmeridge Bay. The tide was coming in when we arrived, which wasn't ideal, but we still had plenty of time before it reached the highest point. We also had the sun reflecting from the sea into our eyes.

I could see that we weren't going to get a classic wide-angle shot, as the conditions weren't right, so I suggested we take a more abstract angle and explore the rocks leading out to the sea. As the rocks at Kimmeridge Bay are very dark, almost black, we used this to our advantage to contrast them against the blue sea. To help reduce the sun's glare we used an filter to stop down the light.

The bay was busy with families walking, so we had a play around at using people in the setting to help get a more interesting shot. I showed Russell that by shooting into the sun we could make them into silhouettes.



The wide-angle view wasn't working in the conditions at this location, so we went for some more abstract views and ideas.

Your photos fixed

► SHOOTING ADVICE

The basics



1 By switching to Manual mode, you'll have complete control over your camera's exposure. It's important to review your histogram to check the exposure is correct. Make sure you're not overexposing the highlights. Often we were shooting at 0.3 of a stop under to ensure the highlights remained intact.



2 When shooting landscapes, it can be easier to compose your shot using the Live View setting. The only thing to consider if doing this is that your battery life will drain more quickly. It's important to keep the horizon of your shot straight – you should engage the Grid feature to help with this element.



3 As Russell didn't have a remote shutter release, we used the two-second self-timer mode. This meant we didn't need to touch the camera during the exposure, avoiding camera shake. As we were timing the shutter opening with the waves coming in, we had to factor in the delay.

A sturdy tripod is a must when shooting seascapes. Always wash it afterwards, to prevent salt water damage.



PHOTO FIX #2

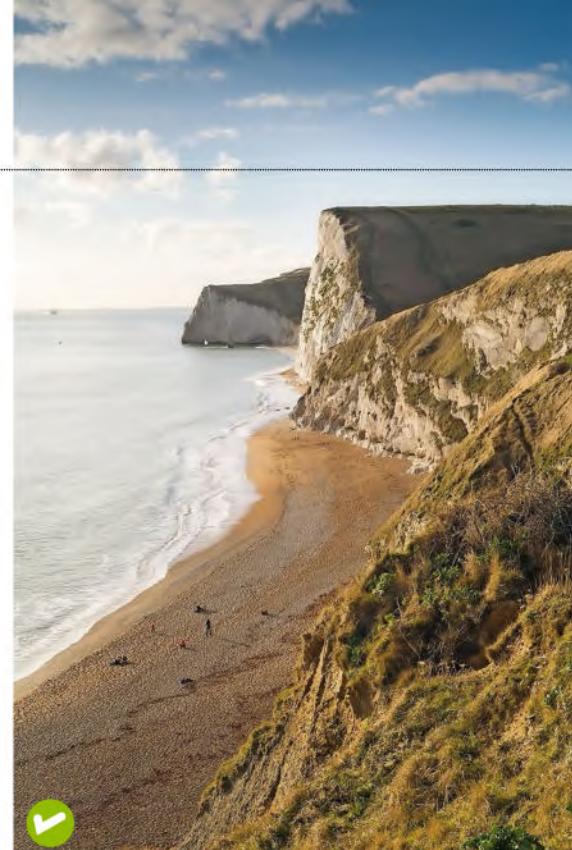
Graduate the sky

Due to the bright blue sky and head-on sun, we were faced with quite a challenge when it came to enhancing the sky. Luckily I had packed some ND grads. I showed Russell how to slide one in to help darken the top part of the sky. I had two grads with me on the day – one was a much softer graduation and one harder. As we decided to shoot a more abstract-looking coastal shot, we opted to use the harder grad to stylise the image.

To enhance the blues in the scene and to create a more interesting result, we played around with the white balance setting. By altering the white balance to Tungsten, your camera will pump in lots of blue, as it's trying to compensate for an orange light cast. Russell shoots in raw, so he was already fully aware that he could cool his images down at the post-production stage, which he was happy to do.



On clear bright days when there are no clouds in the sky, a graduated filter can help add a more stylised look to a seascape scene



By switching to a portrait orientation, the composition is considerably stronger

PHOTO FIX #3

How about portrait?

Russell is so used to shooting in a landscape orientation that I think he forgot he could turn his camera onto its side! There are some scenes that work much better in a portrait composition – like the one we were presented with at our second location.

For this image we decided not to include the iconic Durdle Door rock in front of us, but to focus on the

cliffs to the right of it. The portrait-format composition meant we could remove the negative and empty space of the sea, and the layers of the land added to the end result.

We were shooting at this location later on in the day, and the sky and light were perfect. We finally used the ND grad to help enhance the blue of the sky and the white clouds, creating a cracking final shot. ☺

PHOTO FIX #4

Shutter speed matters

Russell had never been to Durdle Door, so to get our final shot of the day we headed down to the edge of the water to shoot the iconic rock formation. We arrived around 45 minutes before sunset, and the light was casting a lovely warm glow. When we took a shot without using any filters, we couldn't expose the scene using a slow enough shutter speed, so the sea didn't look very appealing. I showed Russell that by inserting a ND stopper, we could get a shutter speed setting of two seconds, which was enough to blur the water, giving it a silky finish. To make sure we were getting the best result, we had to time our exposure with the movement of the waves coming in. We were

shooting on the turn of the tide – we were unlucky on a couple of occasions and got our feet wet! We also faced the problem that when the water came in too far it knocked the tripod, therefore ruining the shot. We had to shoot quite a few frames to get the one we were happy with.

I reminded Russell that after our shoot we needed to rinse off the tripod with fresh water, otherwise the salt water would perish the tripod's catches.

From spending time on the beach and practising this slow shutter technique, Russell realised that capturing motion in a landscape image, for example water or the passage of clouds, can greatly enhance the final result.



WITHOUT ND

By using an ND stopper we were able to shoot using a much slower shutter speed setting, which enabled us to capture a lovely, silky water effect.



WITH ND

Gardens... fixed!

Our experts visit Devon to help Marilyn Stevens improve her garden photography



HELP MY GARDEN PHOTOGRAPHY TO GROW!

Having just retired, I have bought a Panasonic G5 with 14-42mm and 45-175mm zooms so I can get back to photography. In the good old days, I owned an Olympus OM-1, which I loved. I need to get to grips with the manual features of my digital camera. I'm particularly interested in taking pictures of gardens and flowers.

Marilyn Stevens, Taunton

Location shots: James Paterson



Down the garden path...

Photography enthusiast Marilyn Stevens wanted to kick-start her confidence with her brand-new compact system camera. She used to own an SLR, and until recently taught art to secondary school students – so she already has a good eye for a picture. Marilyn

has studied garden design and is a member of the Royal Horticultural Society, so she loves taking pictures of plants. The Photo Fixer met up with Marilyn at the beautiful gardens at Rosemoor, near Great Torrington in Devon, to see if he could help.

► THE DIAGNOSIS

Where's Marilyn going wrong?



To start, the Photo Fixer observes Marilyn as she shoots to discover the general approach she takes



Angela's first shots of Rosemoor certainly show the colour of the beds, but their wide framing mean that it's hard to see the wood from the trees



It was the height of summer, and the Rosemoor borders and flower beds were looking at their colourful best. But it was clear from looking at Marilyn's early shots that her main problem was that she needed help to use her camera settings to create a stronger focal point in her pictures. She had a tendency to shoot too wide, so the beauty of the garden that she saw was getting lost in the jumble of the picture itself.

It was time to get Marilyn to simplify her compositions, and then use the focussing, aperture and zoom controls to create a better feeling of depth and emphasis in her pictures. The first approach that our editor and Photo Fixer Chris George recommended was to switch from her kit zoom to her telezoom. Using this at its longest focal length allows you to stand back to compress a bed of flowers into a single frame – but simultaneously lets you minimise depth of field, so that only a small patch of blooms is critically sharp, giving you an obvious focal point.



Your photos fixed

▶ USEFUL ACCESSORIES

Shopping list



1 Travel tripod

Marilyn realises that a tripod is at the top of the list of add-ons she needs. We lent her this Velbon tripod for the day at the RHS garden at Rosemoor. Its five-section design means that it can easily be carried in her day pack, so that she can carry it on trips to aid composition, and to allow longer exposures.



2 Macro lens

Marilyn saw how close you can get to individual blooms using her telezoom. A macro lens, like this Nikon 60mm that the Photo Fixer owns, lets you magnify the subject even more. The two macro lenses made for Marilyn's Micro Four Thirds camera are the Olympus 60mm f/2.8 and the Panasonic 45mm f/2.8.



3 Diffuser

We had a bright but overcast day in Devon, so we had the perfect soft light for shooting flower beds. On sunny days, however, the bright highlights and shadows can create too much contrast for decent close-ups. One solution is to use a fold-up diffuser to put the bloom into a pool of shade.



So many flowers, so little time... Chris shows Marilyn how to find the perfect blooms to shoot, looking not just for the quality of the flower, but the backdrop available to shoot against

PHOTO FIX #1

Shallow, yet focused

With her telephoto lens fitted, Marilyn was now at the first step towards restricting the number of flowers that were sharp in the image. But to get a decent

amount of blur in the background, she also needed to use a wide aperture to minimise depth of field even further.

Marilyn was already using Aperture Priority (A) mode on her Panasonic, and this was the ideal exposure mode to stick to for this assignment. Using the thumb-wheel, she could then adjust the aperture to its maximum available setting with this lens of f/5.6. Now all that would be sharp in the shot would be a few flowers, create a strong focal point for her pictures.

With this came a new problem... Marilyn now needed to be fussier about which flower she focussed on. The Photo Fixer showed her how to switch to Single-AF mode, pick a point to focus on, and tweak the position with the cursor keys.



Controlling depth of field is just part of the approach: choose a bloom and a shooting position that gives the cleanest background

**PHOTO FIX #2**

Get in as close as you can



For this shot, Marilyn set her zoom to its longest 175mm setting, then got in as close as possible to find its minimum focus distance. Now she only needed to crop the image by half to get this full-frame close-up

Although Marilyn didn't have a macro lens, we showed her how she could get decent close-ups by using her telephoto zoom. All she needed to do was to get as close as possible without the autofocus system warning her that she was too close to the subject.

At the minimum focus distance, her 45–175mm zoom gives her an image on the sensor that was one fifth life-size (1:5). With just a bit of cropping, this would give powerful close-ups of all but the smallest of flower heads – as Marilyn's shot above proves.

PHOTO FIX #3

Compensation entitlement

In aperture-priority mode, Panasonic's default 144-zone metering system does a decent job of getting the exposure right most of the time. But there are some floral subjects that should trigger alarm bells, and have you reaching for the Quick Menu and the Exposure Compensation dial...

1 A close-up of a white flower that fills the frame should make you think about using some positive compensation. Camera meters tend to assume a certain average brightness across the frame, so a bit area of white or a light tone will tend to give you an image that is a bit muddy and grey. Exposure compensation of around +0.5 or +1.0 will usually make the blooms more naturally bright.

2 It's a similar deal if the subject is particularly dark and filling a large portion of the frame. Deep purple flowers or dark green foliage, for instance, will often look better if you apply some negative exposure compensation – getting the camera to override the meter and darken the image slightly with a compensation setting of -0.5 or -1.0.

3 It's not just the subject that you need to watch out for. Sometimes a particularly bright or dark background can fool the meter and mean you need to tweak things using exposure compensation – as Marilyn discovered when framing a Rodgersia flower against the dark rocks of a water feature later in the day.



Macros... fixed!

Nicola Hesketh is in a muddle with her macro lens. Can we help her to master the techniques for shooting close-ups?



HELP ME TAKE CLOSE-UPS WITH MY NEW MACRO LENS

I have recently bought a Nikon AF-S 105mm macro lens for my D5100 to shoot close-ups, which I haven't been able to achieve with my existing lenses. I understand the basic principles of shooting close-ups, but haven't had a chance to really explore the possibilities with this lens. Can you help?

Nicola Hesketh,
Bristol

Dave Caudley



Close, but not close enough

Getting pin-sharp close-ups and macro shots can be hard. The limited depth of field at wide apertures means your focusing has to be spot on, but using smaller aperture settings can lead to problems with distracting backgrounds and camera shake.

Nicola has found it difficult to get to grips with the extra accuracy needed when shooting close-ups. She has a good understanding of

exposure and is happy shooting in Manual and Aperture Priority modes, but has struggled to find the best settings with her macro lens.

We meet at the North Somerset Butterfly House near Bristol, which houses a huge range of butterflies. This makes it easier to show Nicola the techniques, rather than chasing wild butterflies. But they are still free to fly away, making them a challenge to me too!

► THE DIAGNOSIS

Background information



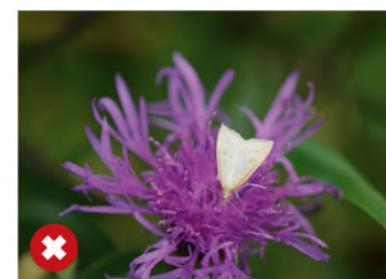
Nicola has mastered shooting many subjects, but needs some help using her macro lens

Nicola hasn't had many opportunities to try out her new lens, and when she has used it she has struggled to find any suitable subjects. Despite this, her shots show she has a good understanding of how to control the depth of field and exposure using other lenses

on her Nikon D5100. When Nicola has previously shot butterflies with her 18–200mm lens, she hasn't been able to get close enough to fill the frame. Along with the photographic challenges of shooting close-ups, getting good shots of butterflies also demands some fieldcraft skills

to allow you to get close enough to the subject.

While this is easier to achieve in a controlled environment such as the butterfly house we were visiting, it still takes skill and patience to get in close enough to get your shots, and also find a good viewpoint.



PREVIOUS ATTEMPTS

The few times that Nicola's had a chance to get out with her 105mm macro lens, she has struggled to get pin-sharp results, and to choose the best aperture to get the best results

►SHOOTING ADVICE

Handy kit for macro shots

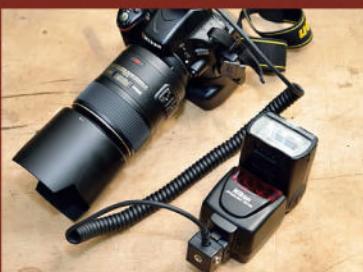
Here are three pieces of photography kit that are invaluable help for getting close-up shots of tiny wildlife

**1 Macro lens**

A dedicated macro lens will make it much easier to get close-ups of butterflies and other small subjects. Nicola's Nikon AF-S 105mm offers a vibration reduction (image stabiliser) system to combat camera shake.

**2 Reflector**

A small reflector, such as this Lastolite 12-inch silver/white model, can be perfect for bouncing light back onto the subject when they settle in a shady spot. This is useful in butterfly houses, where most of the light tends to come from above.

**3 Flashgun**

A flashgun gives extra options for shooting in shade, and adds colour and punch to your images. It's best to use an off-camera cord or remote triggers to light the subject from different positions.

**PHOTO FIX #1**

Maintaining focus

Nicola has a very good understanding of photography, but the shallow depth of field when shooting macro images means she has struggled to get consistently sharp results.

It's tempting to shoot at the widest aperture to achieve fast shutter speeds, but I encourage Nicola to use a smaller aperture, such as f/5.6, to increase the depth of field. To keep the results sharp, Nicola sets the ISO to 400. This will allow her to keep the shutter speeds as high as possible and avoid camera shake without producing too much noise.

I also get her to keep adjusting the autofocus point so it's positioned over the head of the subject: it's still vital that the focus is there, rather than the wings or body of the insect.

Right and below
Positioning the autofocus point over the head of the butterfly means Nicola's shots improved a lot





PHOTO FIX #2

Generating additional light

Even though Nicola has got some great shots here at the butterfly house, there are plenty of occasions where a butterfly lands in the shade of the leaves and foliage, making it too dark to get a good shot.

In order to help her to improve her shots in these situations, I show her how a simple collapsible reflector can help to bounce light back into the shadows when the butterfly has settled in a dark area.

Even though the reflector assists greatly in many of these locations,

there are still some areas where it's impossible for the reflector to do its job, as there simply isn't enough sunlight to bounce back into the shadow areas.

In these tricky areas, I show Nicola how she can attach her flashgun to an off-camera cord (bought separately) to help her out with the light issues.

With the flash set to automatic TTL exposure mode, I get Nicola to set the flashgun to -1EV, so that it adds just enough light without overexposing the images. ☺



Top Shooting butterflies under the shade of the foliage in the butterfly house, Nicola initially struggled to get any decent results

Above Using her SB700 flash to add some fill-in light helped Nicola to achieve a much brighter and far better lit image

PHOTO FIX #3

Behind and beyond

As Nicola is getting consistently sharp results, we decide to address how she can improve her close-ups and macro shots.

One of the biggest problems of shooting in a butterfly house is that often the butterflies feed or settle on flowers where the windows or frame of the butterfly house are visible in the background.

These man-made structures spoil several of Nicola's otherwise good shots; so once she has found a suitable subject, I encourage her to try to find a viewpoint where

there is foliage or flowers in the background to give her photography a much more natural appearance.

Getting these backgrounds takes a great deal of patience and persistence, though: most of the butterflies seem to be intent on landing on flowers where the only background option is the unsightly roof or windows of the butterfly house.

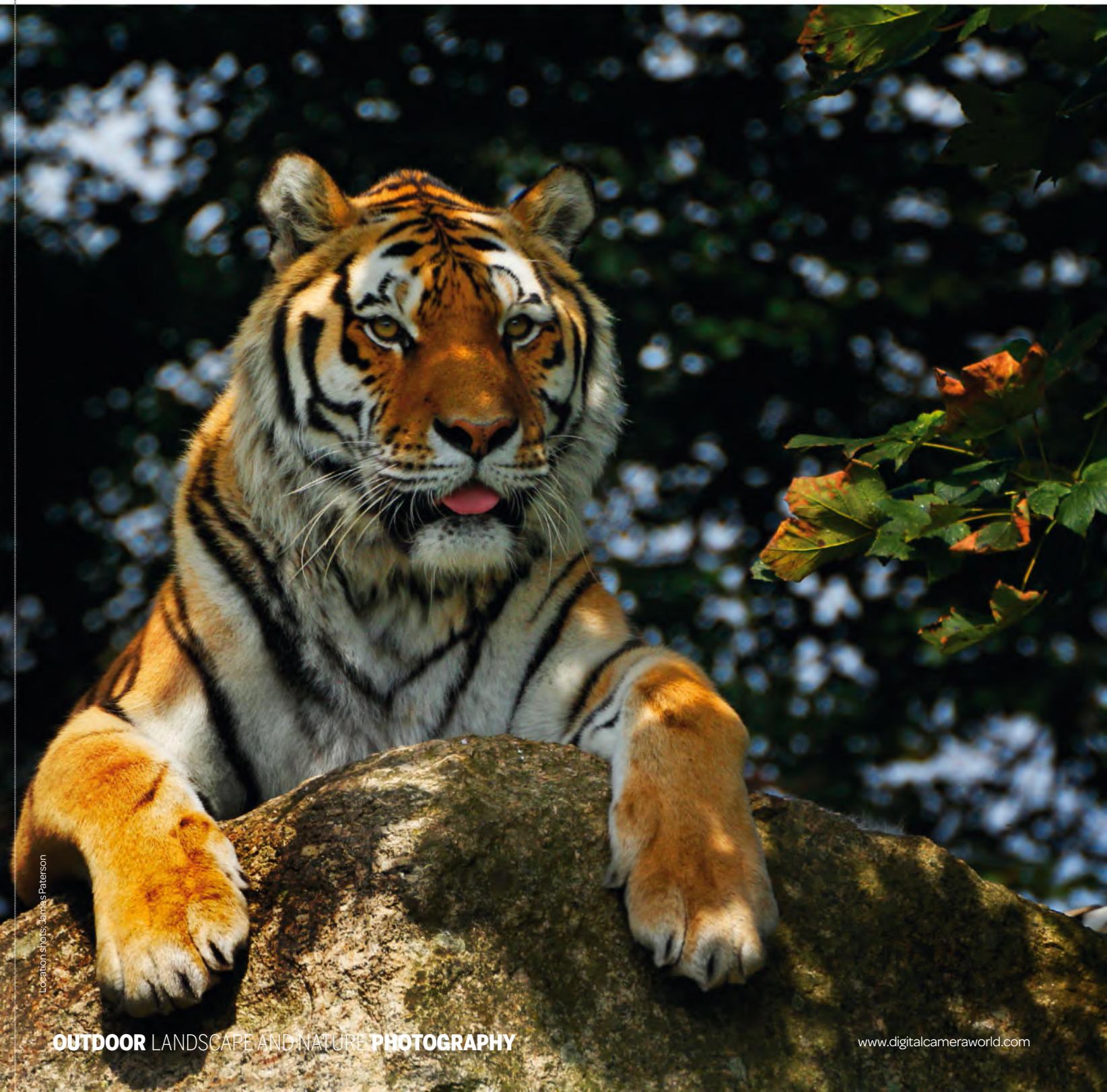
But after a short wait, Nicola is able to find a few willing subjects that give her the opportunity to use a much more attractive background and get much better-looking results.

Below and right By waiting and carefully choosing the right subject and viewpoint, Nicola managed to avoid too many shots being spoiled by the man-made structures of the butterfly house being visible in the background



Wildlife... fixed!

Enthusiast Jamin Chetter is keen to improve his wildlife photography. Can we add some magic to his animals?



Location shots: James Paterson

A captive audience

Wildlife photography is one of the most challenging, but rewarding genres.

Along with mastering the technicalities you've also got one of the most unpredictable subjects to deal with. Jamin isn't alone in struggling to get to grips with improving his wildlife shots. Jamin has already managed to get some good wildlife images, but

he needs to think more about the backgrounds if he is to move to the next level. It can be extremely difficult to find subjects in the wild to practise these essential skills, so we decided to make it a little easier by heading for Dartmoor Zoo, where there's some guarantee of finding suitable subjects – even if they could still prove unwilling to pose for the camera.



HELP ME GET BETTER WILDLIFE PHOTOGRAPHS

There are many photography types I'm interested in, but I'm particularly keen on wildlife. I have a Canon EOS 60D and a Sigma 170-500mm lens, and I've been able to get some shots that I am happy with, although I'd really like to raise my hit rate, and capture more natural-looking images. Can you help?

Jamin Chetter

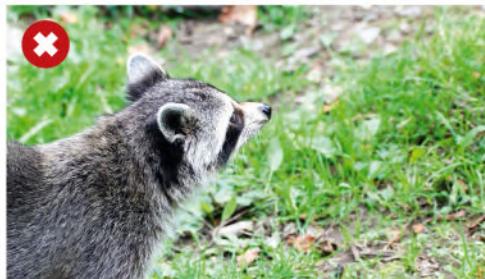
Bridgwater, Somerset

THE DIAGNOSIS

A walk into the wild



Chris goes through Jamin's shots to find out which areas and techniques he needs help with to improve his images



Jamin has managed to get some sharp and well-exposed shots, but there are still areas where he could improve. These are mainly fine-tuning his composition and improving his choice of backgrounds

On arrival we were met by Dartmoor Zoo marketing manager Neil Jones, who also runs their photography tours. We had chosen Dartmoor because, unlike some zoos, the enclosures and surroundings are kept as natural as possible. To some visitors, this can look like the zoo is less polished than some larger zoos – but this policy of letting vegetation and foliage grow naturally within many enclosures actually made them much more photogenic, giving us the best chance of getting great shots.

There are also many viewing areas free from the usual wire mesh fences or perspex screens, giving a much better view of the animals, although there are still fences where necessary. Neil explained that he could get closer to these fences on his photo tours, so it would be possible for Jamin and I to get this access where safe.

After a short discussion about which animals were likely to be the best subjects, we decided to get started...

► SHOOTING ADVICE

Wildlife photography settings

**1 Choose the right aperture**

Controlling the depth of field is one of the best ways to increase your chances of getting better animal shots. Choose an aperture such as f/5.6 or f/8, which will keep the face of the animal sharp, but blur the background and foreground to make the subject stand out.

**2 Watch the shutter speed**

When shooting with long-focal-length lenses, keep a close watch on the shutter speed to avoid camera shake or subject movement spoiling your images. For most images you should aim for a speed of 1/500 sec or faster, so you may need to increase the ISO to 800 or 1,600.

**3 Select the right AF point**

For most animal shots, you should focus on the eyes and head of the subject. This won't always be in the centre of the frame, so select the manual focus point mode, then choose the focus point that corresponds to where the head or eyes are in the frame.

**PHOTO FIX #1**

Look for natural environments

One of the challenges of zoo photography is omitting the fences, posts and other man-made structures that are visible in every enclosure. So we started by looking at the techniques Jamin could use to either mask them out, or avoid them spoiling his images.

As we arrived at each enclosure, I reminded Jamin that it's always worth taking a look around the environment for the areas that give the most natural-looking background, then to explore how this was affected by the different viewpoints available. Then

it was just a case of watching where the animal was likely to go within the enclosure, and wait for it to move into areas that gave the most natural images.

Along with using foliage and trees in the background to mask fences and structures, I showed Jamin how he could use foliage in the foreground to both cover up the background and create natural frames for his images. Armed with his telephoto, Jamin was already taking better shots.

Waiting for this deer to move from the fence, then moving his viewpoint, allowed Jamin to get a more natural-looking result



**PHOTO FIX #2**

Shooting through fences



By carefully watching where his lens was positioned relative to the mesh of the wire fence, Jamin was able to get much clearer images of this lioness

Enough though many enclosures at Dartmoor Zoo have clear viewing areas, there were still several areas where there were wire mesh fences for Jamin to shoot through. With Neil on hand, we were able to get closer to these obstructions where it's safe to do so – but the mesh was still visible in many of Jamin's images.

I got Jamin to position his lens so that the centre was located over spaces in the mesh, rather than over the wire itself. With the lens hood almost touching the fence it was much easier to make the wire much

less visible, particularly when he used the longer focal lengths and the widest apertures with his 170–500mm lens.

This took some practice, because it was easy for the lens to move while Jamin was concentrating on framing his shots; but after a short while, he was able to get a much higher percentage of images where the wire is much less intrusive. It was almost impossible to make the wire completely invisible, but these simple techniques helped Jamin get more successful shots from behind a wire fence. ■

**PHOTO FIX #3**

Capture behaviour and movement

As Jamin became more confident capturing great portraits of the animals, we decided it was time to add an extra element to his zoo images, by working to capture more of their behaviour and movement, rather than when they are stationary.

This is where Neil's knowledge of the animals came into its own. He was able to give us insight into what each animal was likely to do – although, as with any animals, there were no guarantees.

One of the wolf enclosures proved to be the ideal location to put this to the test. Just before we arrived, there was the eerie sound of wolf calls echoing across the zoo. After just a few minutes of watching, one of the wolves

in our enclosure jumped up onto a rock and started to join in with the howling. So I got Jamin to move along the viewing area to get a shot of this howling wolf against the stonework of a building in the background.

In-between these calls, the wolves ran across the front of the enclosure. Jamin captured these excursions perfectly, as he was much more confident at predicting where the wolves were likely to go, and which settings he should use.

By first scouting out locations where clean backdrops presented themselves, then reacting to the action and waiting for the right moment to take his shot, Jamin captured some great shots of these wolves



Trails... fixed!

We help enthusiast Richard Norman to capture brilliant light trails in the heart of the city



HELP ME TO CAPTURE BETTER LIGHT TRAILS

I've owned a Canon 600D for two years, along with an 18–70mm zoom and a 50mm prime lens. I would welcome the opportunity to get some tips from a pro to help me progress. I love to shoot a variety of subject matter, from macro images to city scenes. Please can you help me out and give me some tips?

Richard Norman, Bristol

Location shots: James Patterson



Slow down time

After the sun has set, cities take on a different character, and are full of opportunities to capture creative photographs. Ordinary scenes of dull grey buildings and roads are transformed into magical spaces where lights whizz by. By slowing the shutter speed on your camera, you can capture traffic trails from cars and other

vehicles. Richard was keen to perfect his light trail photography and also get some general tips to help him advance. Richard's photographic knowledge has been self-taught over the past four years, so he was happy to break out of his comfort zone and get some hands-on advice. Richard came prepared for the shoot with his tripod and a remote shutter release.

► THE DIAGNOSIS

Let there be light!



Claire explains to Richard how to set up his camera and covers the basics of exposure settings



Richard has experimented with his photography, but needs to spend more time refining his skills and working up his compositions

I met Richard after he finished work, on a chilly winter's night in the centre of Bristol. Finding the right location for a shoot like this is key – but luckily, Richard and I are both local to the area, so we know where the photo hotspots are dotted around!

I suggested that we start by photographing St Augustine's Parade in the heart of the city. This popular location, next to Bristol's Hippodrome theatre, has endless cars, bikes, people and buses passing by in the rush hour. The trick for shooting light trails is to have a steady flow of traffic – and people passing by can also add to the final result.

You would usually aim to be on location for twilight when shooting light trails. This is the time after the sun has set but before the night sets in. You get a lovely blue tint to the sky that works well. Unfortunately, due to Richard's work schedule, we arrived on location a little later than I would have hoped – but nevertheless we set off with plenty of enthusiasm.

► SHOOTING ADVICE

Essentials**1 Keep it steady**

A tripod is a must to keep your camera steady – but pressing the shutter button may well cause camera movement, so a remote shutter release is also a must. Finally, lock your camera's mirror in the 'up' position to avoid unwanted vibration. If you're using a CSC, or Live View on your SLR, this won't be an issue.

**2 Slow shutter speed**

To control the final outcome, put your camera into its Manual mode. Shooting moving lights can be tricky, so take a couple of test shots to get an idea of your exposure settings. Make sure the shutter speed is slow enough to capture the passing lights. Eight seconds is a good point to start from, then adjust it from there.

**3 Manual focusing and Live View**

To ensure you're getting a sharp shot, engage Live View and use manual focus. (Autofocus would shift due to the moving traffic.) Zoom in on the back LCD screen to the 10x setting and navigate the screen over to the main focal point. Twist the focusing ring until the screen becomes sharp.

**PHOTO FIX #1****Get the timing right**

At our first location, we mounted our cameras to our tripods and got ready to shoot. Although Richard already has a solid grasp of the basics of photography, we covered them again briefly, and also discussed the all-important shutter speed setting that was going to capture the moving lights. We started with an eight-second setting, then adjusted it accordingly depending on the result.



When cars are still, the light trails effect won't work. It can be effective to work up a composition from a central reservation

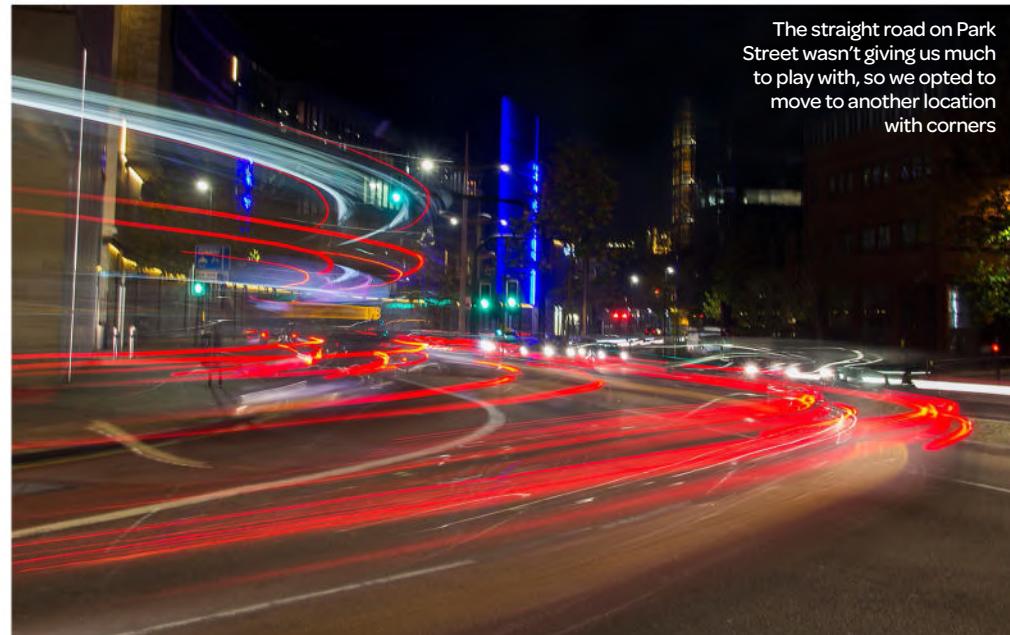
When you're shooting moving traffic, it's difficult to be able to calculate the correct exposure, so it's important to review the histogram on your camera's rear display after each shot. Richard wasn't used to this feature on his camera but, as I explained to him, the problem with simply checking your shot on the LCD screen is that the image will look different when viewed under different light sources.

Once we were happy that we had our exposure setting correct, we waited for some buses to pass by. Buses are particularly good for shooting light trails, as their high sides fill the frame. We had to time our shots and to make sure the traffic was continually flowing in each direction. After getting some decent results here, we decided to move on...



PHOTO FIX #2

Round the corner



The straight road on Park Street wasn't giving us much to play with, so we opted to move to another location with corners

Our second location was Park Street, which has a long straight hill. Richard has tried to capture light trails here, but has struggled. It's a difficult location because there are no corners!

Bends in the road move the light trails through the frame, so you can get a more pleasing composition. Richard tends to come in too tight with his framing, but I explained

that it's important to leave negative space for the vehicles to drive into.

After trying a few compositions, we weren't happy with the results, so I suggested we try some zoom burst effects. Richard's 18–70mm lens is perfect for this type of effect. To shoot a zoom burst, you need to use a much faster shutter speed, say 1/4 sec, and simply twist the lens as you take the shot. ☺

PHOTO FIX #3

A different angle

For our final location, we headed down to the busy roads surrounding Cabot Circus. There were plenty of traffic lights, junctions and pedestrian crossings that could be used to our advantage. The traffic was starting to die down, so we needed to make the most of the end of rush hour to get a cracking shot. We managed to work up a couple of compositions from ground level – and at one point a police car drove past with its flashing lights that definitely added an extra cool touch.

As we'd been working at ground level all evening, we thought it might be fun to finish with an aerial shot. We managed to find a location on top of a car park to get a bird's-eye view of the scene below. We were limited in where we could compose the shot from, however, as the barriers surrounding the car park were high. We also had to wait a few moments to make sure the cars were moving in both directions to capture the red and white light trails. But the new perspective really helped the shots.



Scenes from above offer great opportunity when it comes to shooting light trails. Make sure there is moving traffic in all directions to get the shot to work





GEAR REVIEWS

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Wide-angle primes

Wide angles and wide apertures abound as we put eight prime cuts to the test



⑤



⑥

THE CONTENDERS

- 1 Canon EF 24mm f/1.4L II USM £1,195 / \$1,550
- 2 Fujifilm Fujinon XF18mm f/2 R £380 / \$370
- 3 Nikon AF-S 24mm f/1.4G ED £1,465 / \$1,930
- 4 Nikon AF-S 28mm f/1.8G £495 / \$695
- 5 Olympus M.ZUIKO DIGITAL ED 12mm f/2 £500 / \$800
- 6 Panasonic Lumix G 14mm f/2.5 ASPH II £280 / \$395
- 7 Pentax HD DA 15mm f/4 ED AL Limited £500 / \$476
- 8 Samyang 24mm f/1.4 ED AS IF UMC £550 / \$600

⑦



①



⑧



③



②



④



Many digital photographers reach for a wide-angle lens only when they've hit the stops on their standard zoom. Going wider has the benefit of being able to shoehorn more into the image. It's great for landscapes with big dramatic skies, and equally useful for interiors where you're physically constrained by the walls of a building. But there's more.

Wide-angle lenses are brilliant creative tools for exaggerating perspective. Move in really close to the main object in a scene, and the middle distance shrinks away at an alarming rate. The results can be truly eye-popping images. Environmental portraits are a particular favourite.

Bearing all this in mind, photographers often tend to use a wide-angle zoom at or near its shortest focal length. Maximising the viewing angle will naturally maximise the wide-angle effect – and, after all, that's why you switched from your standard zoom in the first place.

There's something to be said, therefore, for wide-angle lenses with a fixed focal length. Need a wider viewing angle than is available from your standard zoom? Just fit this on your camera instead. It's almost too easy – so it's rather bizarre that while there are plenty of wide primes for full-frame SLRs, there are practically none being manufactured for the vast majority of APS-C format SLR cameras. Fisheye optics aside, you're pretty much forced down the zoom lens route. One notable exception is the Pentax 15mm lens, one of the eight featured in this group test.

Shrink the size of the image sensor further still, and interesting

Kit anatomy Little and large

One of the most obvious differences between the various lenses in this test group is their physical size. Some are big and weighty; others are tiny and amazingly lightweight. At one extreme, the Canon, Nikon and Samyang 24mm lenses are around 80mm in diameter and nearly 100mm in length, and weigh anything up to 650g. At the other, the dinky little Panasonic 14mm lens measures just 56x21mm and weighs next to nothing at 55g.

Generally speaking, the difference in size depends on two factors. First, the physically larger surface area of full-frame image sensors compared with APS-C and especially Four Thirds sensors means that the image circle created by the lens needs to be larger. Second, 'faster' lenses with wider available apertures need a front element that has a physically larger diameter, to let in more light.



Wide-angle primes feature diverse designs and sizes

"Need a wider viewing angle than is available from your zoom? Just fit this on your camera instead"

prime options start to re-appear, including the Olympus 12mm and Panasonic 14mm lenses, also on test. Taking the focal length multiplier, or crop factor, into account, the effective focal lengths of the Pentax, Olympus and Panasonic lenses work out to 22.5mm, 24mm and 28mm respectively. Meanwhile, Fujifilm's

APS-C based X-series compact system cameras (which have a 1.5x crop factor) are also well-supported with a growing range of X-mount wide primes, the 18mm edition of which is featured in our test.

WHY PRIME?

If you're only using a wide-angle zoom lens at or near its shortest focal length, the versatility of having a zoom is largely lost. There's therefore no good reason for potentially degrading image quality by using a zoom instead of a prime. Indeed, we ran a group test of wide-angle zooms for crop-sensor cameras in issue 156, and found that they tended to suffer from pretty extreme barrel distortion at the short end of their zoom ranges. With the simplified design enabled by a fixed focal length, prime lenses typically deliver less noticeable distortions.

The next question is: how wide do you want to go? Most APS-C format wide-angle zooms have a focal length range of around 10–20mm, equivalent to 15–30mm on a full-frame camera. The prime lenses in this test tend to have an effective

How we test lenses Advice you can trust

Our lens tests are based on a two-stage procedure. Firstly, lab tests are carried out, shooting two test charts under controlled lighting conditions. The results are processed using Imatest Master, so that we can quantify optical performance in terms of sharpness, chromatic aberrations and distortion. Overall quality is

assessed at the centre, edges and corners of the images.

For real-world testing, we use each of the lenses under widely varying indoor and outdoor lighting conditions. Overall handling is checked, along with smoothness and precision of focus rings, and the operation of all switches. We also test the speed and accuracy of autofocus

systems, complete with operation of full-time manual override where available. Due to the wide angles of view enabled by these lenses, we also check for vignetting (darkened image corners), especially when using the widest available apertures. Ratings are finally given for features, build quality, image quality and value for money.

focal length (or actual focal length for full-frame compatible lenses) of 24mm or 28mm. In real terms, they therefore go no ‘wider’ than many standard zoom lenses at the short end of their zoom range. Ultimately, you’re not gaining much in terms of outright viewing angle, if anything at all, by switching from a standard zoom to one of these wide-angle prime lenses.

However, along with a noticeable reduction in barrel distortion, compared with most standard zooms at their shortest focal length, there’s another significant bonus in terms of speed. Most of the full-frame compatible primes in this test have a ‘fast’ widest available aperture of f/1.4 – the exception is the Nikon 28mm lens, which still offers a respectable f/1.8 widest aperture. Aperture widths are still impressive for most of the lenses designed for crop-sensor cameras, including the Fujifilm 18mm f/2, the Olympus 12mm f/2 and the Panasonic 14mm f/2.5. By contrast, the Pentax 15mm lens only has a widest available aperture of f/4 – three full f/stops slower than the f/1.4 lenses.

WHY WIDE?

What’s so important about a wider aperture anyway? The ability to reduce depth of field isn’t normally a requirement for wide-angle lenses, although very wide apertures can still give the possibility of blurring the background when using these lenses at or near their shortest focus distances. A more popular benefit of wider apertures in wide-angle shooting is to enable faster shutter speeds for freezing action and for avoiding camera-shake. It can make a big difference in dull lighting conditions, and for handheld shooting indoors or at twilight, enabling sufficiently fast shutter speeds without having to push the camera’s sensitivity settings too far.

In summary, then, wide-angle prime lenses should give excellent image quality and are useful for an incredibly diverse range of indoor and outdoor shooting requirements. As we’ll see from the following individual reviews, however, features and image quality can vary considerably between competing lenses – and there’s a big spread of prices as well.

EQUIPMENT KNOW-HOW

FEATURES TO LOOK FOR

Take a wider view when choosing your new lens

Focal length

Multiplying the actual focal length of each lens by the camera’s crop factor (one for full-frame cameras) gives the effective focal length you can expect from the lens.

Distance scale

This is useful for setting the hyperfocal distance, at which everything from half that distance to infinity should be rendered sharp in images, to maximise depth of field.

Autofocus

Ring-type ultrasonic autofocus is generally quickest, while stepping motors give smooth, silent autofocus transitions for video capture. The Samyang is manual focus only.



Lens hood

A lens hood for reducing ghosting and flare from peripheral light is included with most of these lenses. There isn’t one for the Panasonic, and it’s an optional extra for the Olympus.

Control rings

Most lenses only feature a focus ring, but the Fujifilm and Samyang lenses also feature an aperture ring, which means the aperture can be set directly on the lens itself.

Attachment thread

Attachment thread sizes range from 46mm in the Olympus and Panasonic Micro Four-Thirds lenses, up to 77mm on the full-frame compatible 24mm f/1.4 lenses.

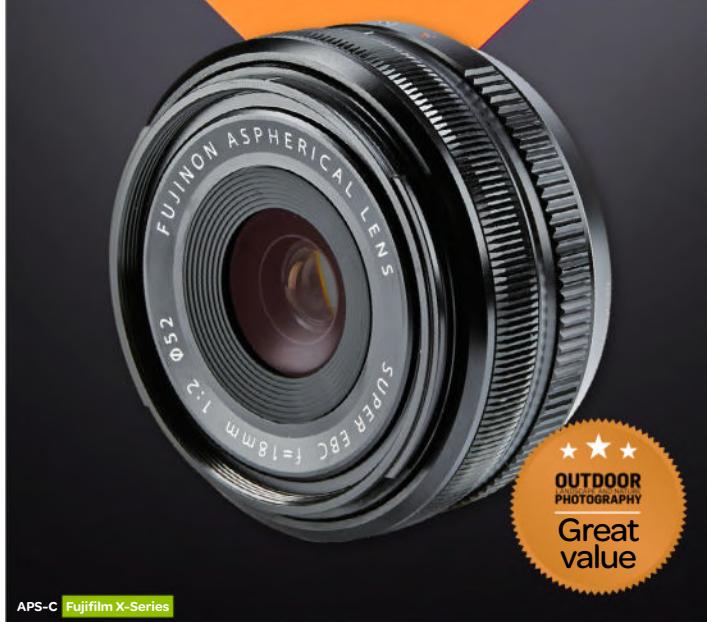
Focus rings Explained

With the generous depth of field enabled by wide-angle lenses at medium to narrow apertures, a favourite trick is to focus about a third of the way into the scene. This approximates the hyperfocal distance, and should ensure that everything is sharp in the

resulting picture, from the foreground to the distant horizon. Although this trick helps for most types of shots, it’s especially useful for landscapes. As a bonus, most of these lenses feature a focus distance scale with depth of field markings for various aperture settings.



FULL-FRAME Canon EF



APS-C Fujifilm X-Series



Canon EF 24mm f/1.4L II USM £1,195 / \$1,550

A sequel for Canon's big wide prime

The Mark II edition of this lens isn't merely a minor tweak, but represents a complete redesign. It boasts an extra two elements over its predecessor, taking the total number from 11 to 13, and its more rounded aperture is based on eight rather than seven diaphragm blades. As one of Canon's L-series (Luxury) lenses, it has professional-grade build quality and comes complete with weather seals. The latter isn't true of all L-series lenses.

Like the Nikon 24mm f/1.4 (see opposite page), the Canon lens is pricier than other lenses here. Further similarities include a particularly strong build, based on a metal rather than plastic barrel. There's a floating, fully internal focus system, powered by a ring-type ultrasonic autofocus mechanism.

Upmarket glass includes two aspherical elements to guard against spherical aberrations (common in wide-aperture lenses) and two Super UD (Ultra-low Dispersion) elements to correct lateral chromatic aberrations.

PERFORMANCE

While a wide f/1.4 aperture is great to have, image quality is unimpressive at this setting. Vignetting is pronounced, and there's a distinct lack of sharpness towards the edges and corners of the frame. Our review sample also suffered from a front-focus issue during autofocusing, although this was effectively bypassed in Live View mode. For the best image quality with this lens, stick to apertures between f/4 and f/8.



Tech focus...
13 elements in 10 groups; 8 diaphragm blades; closest focus distance, 25cm; 77mm filter thread; ring-type ultrasonic autofocus; 80 x 87mm; 650g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★

Fujifilm Fujinon XF 18mm f/2 R £380 / \$370

Part of a growing range from Fujifilm

Fujifilm's acclaimed X-series of CSCs is supported by a diverse range of wide-angle prime lenses. These include 14mm, 18mm, 23mm and 27mm options, and a 16mm lens is due in 2015. Thanks to the X-series cameras' 1.5x crop factor, this 18mm lens has an effective focal length of 27mm, along with a reasonably fast widest aperture of f/2.

The retro styling of the lens is a perfect match for cameras like the Fujifilm X-T1. As a 'pancake' lens, it's physically short at 41mm, and comes with an aperture ring that's calibrated in 1/3-click stops.

Build quality is impressive. The lens has a solid metal barrel and mounting plate, although it's not weather-sealed. Focusing isn't internal and the lens extends physically through the focus range but the front element doesn't rotate, easing the use of filters like circular polarisers and ND grads. Although there's no focus distance scale or depth of field markings on the lens itself, this information is presented in the shooting display of the X-T1, which we used for testing.

PERFORMANCE

There's impressively little vignetting, even when shooting wide open. Autofocus is accurate and fairly speedy, and the image quality is good overall. However, the image corners could be a bit sharper at any given aperture. They also suffer a little from colour fringing at medium-to-narrow apertures.



Tech focus...
8 elements in 7 groups; 7 diaphragm blades; closest focus distance, 18cm; 52mm filter thread; micro-motor autofocus; 65 x 41mm; 116g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★



FULL-FRAME Nikon FX



Nikon AF-S 24mm f/1.4G ED

£1,465 / \$1,930

A big lens with a big price tag

The direct equivalent to the Canon 24mm lens (see opposite page), this is Nikon's top-dollar f/1.4 optic for full-frame cameras, and it's the most expensive lens in the group. Pro build quality includes a magnesium barrel and weather-sealed mounting plate. The design uses one less element than the Canon, and the diaphragm has nine blades rather than eight. Aspherical and ED (Extra low Dispersion) elements are utilised.

As a 24mm f/1.4 lens with full-frame compatibility, it's typically chunky, being marginally bigger and very slightly lighter than the competing Canon. Similarities include fast and near-silent ring-type ultrasonic autofocus, and a neat focus scale positioned beneath a viewing window on the top of the lens barrel. Focusing is completely internal but, while both lenses feature a depth of field scale, the Nikon's isn't quite as clear or as well implemented as that of the Canon.

PERFORMANCE

Centre-sharpness is excellent, even at very wide apertures, and levels of sharpness are maintained well, even into the extreme corners of the image frame. The Nikon performs very much better than the Canon in this respect, while also managing to keep vignetting down to lower levels.

Colour fringing is also better controlled, throughout the aperture range. All in all, it's a very pricey lens, but the adage that you get what you pay for certainly applies here.



Tech focus...
12 elements in 10 groups; 9 diaphragm blades, closest focus distance, 25cm; 77mm filter thread; ring-type ultrasonic autofocus; 83 x 89mm; 620g

Nikon AF-S 28mm f/1.8G

£495 / \$695

What a difference a stop makes

This lens is two-thirds of a stop slower than the Nikon 24mm lens to the left. But it costs just one third of the price, making it a much more affordable proposition. Along with the reduced wide-aperture ability, there's a reduction in the angle of view. Even so, the 28mm focal length gives a viewing angle of 75 degrees (measured on the diagonal) when used on a full-frame camera, compared with the 84 degrees of a 24mm lens. As such, it's still a usefully wide lens for indoor and outdoor shooting alike, but loses out to the more generous wide-angle abilities of a typical 24–70mm standard zoom lens.

Barrel construction is based on high-quality plastics rather than magnesium alloy. The lens doesn't feel as robust as the Canon or Nikon 24mm lenses, but it's well-made nonetheless. There are two aspherical elements, plus the application of Nano Crystal Coat and a weather-sealed mounting plate, but there are no ED (Extra low Dispersion) elements.

PERFORMANCE

Nikon's ring-type ultrasonic autofocus system is every bit as fast here as in the company's more exotic 24mm lens and, as usual, it comes complete with full-time manual override. The manual focus ring is even larger than on the Nikon 24mm and equally smooth and precise in operation. Vignetting is more noticeable at the widest available aperture and sharpness isn't quite as impressive, but overall image quality is very good.



Tech focus...
11 elements in 9 groups; 7 diaphragm blades; closest focus distance, 25cm; 67mm filter thread; ring-type ultrasonic autofocus; 73 x 81mm; 330g

FEATURES

★★★★★

BUILD QUALITY

★★★★★

IMAGE QUALITY

★★★★★

VALUE

★★★★★

OVERALL

★★★★★

FEATURES

★★★★★

BUILD QUALITY

★★★★★

IMAGE QUALITY

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VALUE

★★★★★

OVERALL

★★★★★



Four Thirds Micro Four Thirds



Four Thirds Micro Four Thirds

Olympus M.Zuiko Digital Ed 12mm f/2

£500 / \$800

A compact lens with a touch of class

Typical of Olympus-made Micro Four Thirds lenses, this one is physically quite small but nicely engineered. It's from the Premium range of Olympus lenses and is available in silver or black, featuring a stylish but tough metal barrel that plays host to 11 elements. Specialist elements include one aspherical, one DSA (Dual Super Aspherical), one ED (Extra-low Dispersion) and one Super HR (High Refractive).

ZERO (Zuiko Extra-low Reflection Optical) coatings reduce ghosting and flare. However, the lens' rectangular hood has to be purchased separately – and it's not cheap at nearly £60.

Autofocus comes courtesy of a Movie Stills Compatible system that's smooth and silent in operation. Akin to many Tokina lenses, the manual focus ring has a push-pull clutch or 'snapshot' mechanism, as Olympus calls it, which enables you to pull back the focus ring to switch from autofocus to manual focus. This action also reveals a focus distance scale printed on the barrel that ties in with a depth of field scale, listing apertures between f/5.6 and f/22.

PERFORMANCE

Autofocus is rapid for stills and enables smooth focus transitions during video capture. The electronic 'fly-by-wire' manual focusing mechanism operates with precision. Sharpness is both good and even across the whole image frame, right into the corners, even at the widest aperture of f/2. Vignetting is noticeable at this aperture, but becomes less of an issue at f/2.8.



Tech focus...
11 elements in 8 groups; 7 diaphragm blades; closest focus distance, 20cm; 46mm filter thread; stepping motor autofocus; 56 x 43mm; 130g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★

Panasonic Lumix G 14mm f/2.5 Asph II

£280 / \$395

A singularly low-fat pancake lens

So-called pancake lenses have been around for more than a century. While they're available for some SLRs, they've become particularly popular for CSCs. The ultra-short lens barrel design is in keeping with the design philosophy of slimline mirrorless cameras. Even so, this lens takes pancake design to the extreme. It's a mere 21mm in length and a real featherweight at just 55g. To put that into perspective, the Canon 24mm lens on test is about 12 times heavier.

As you'd expect in such a small, light lens, the construction is quite simple. There are only six elements, which is about half as many as in most competing lenses. Build quality feels pretty good, however, with a metal mounting plate and a sturdy plastic barrel. By necessity, the focus ring is very narrow, but the fly-by-wire manual focusing mechanism works well, as does the fast and silent autofocus system.

PERFORMANCE

Naturally, the viewing angle isn't quite as great as from the Olympus 12mm (left), the other MFT lens on test. The Panasonic has an effective focal length of 28mm rather than the Olympus's 24mm, in full-frame terms.

However, the Panasonic is sharper than the Olympus, both at the centre of the frame and into the corners, throughout the aperture range. There's also much less vignetting when shooting wide-open. Barrel distortion is also less noticeable. Overall, it's a cracking little lens that's also great value.



Tech focus...
6 elements in 5 groups; 7 diaphragm blades; closest focus distance, 18cm; 46mm filter thread; stepping motor autofocus; 56 x 21mm; 55g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★



APS-C Pentax K



FULL-FRAME Canon EF Four Thirds Nikon F Pentax K Samsung NX Sony A Sony E

Pentax HD DA 15mm f/4 ED AL Limited £500 / \$476

It certainly looks the business

The current vogue for retro design in cameras and lenses hasn't been lost on Pentax. Drawn from its Limited range of lenses, this 15mm optic drips with yesteryear charm. It's beautifully engineered, with a barrel and screw-in front cap made from hand-machined aluminium. Inside, there are aspherical element and ED (Extra-low Dispersion) elements, plus Pentax's new HD coating to reduce ghosting and flare while increasing light transmittance.

Taking the 1.5x crop factor of Pentax APS-C format SLRs into account, this lens has the widest viewing angle of any in the test group, at 86 degrees. However, it's certainly not a 'fast' prime lens. Its widest available aperture of f/4 is three stops slower than the f/1.4 lenses, and two stops slower than an f/2 lens.

The autofocus system is nothing to get excited about. Driven from a motor in the camera body, it's quite rapid but distinctly noisy. Handling is impaired by the manual focus ring rotating during autofocus, but at least full-time manual override is available.

PERFORMANCE

Given that this lens offers the widest viewing angle in the group, it's a real achievement that it also delivers the joint-least distortion, along with the Canon 24mm. There's little vignetting, even at the modest widest aperture of f/4. At apertures narrower than f/11, however, the image quality is let down by poor sharpness towards the edges and corners of the frame.



Tech focus...

8 elements in 6 groups; 7 diaphragm blades; closest focus distance, 18cm; 49mm filter thread; autofocus driven from camera; 63 x 40mm; 189g

FEATURES

★★★★★

BUILD QUALITY

★★★★★

IMAGE QUALITY

★★★★★

VALUE

★★★★★

OVERALL

★★★★★

Samyang 24mm f/1.4 ED AS IF UMC £550 / \$600

Let's switch to manual

Typically of Samyang lenses, this 24mm design looks like a bit of a throwback. In an age of automation, it takes the path less travelled, with a manual focus system and an aperture ring. So, while most competing lenses can autofocus in a jiffy, and work perfectly well in Program AE and Shutter Priority shooting modes, this one slows you down and keeps your left hand busy.

That said, things are a little more refined in the Nikon-fit edition of the lens. Electronics are added so that the aperture can be controlled from the camera (essential in some SLRs), and focus assistance and confirmation lamps are enabled in the viewfinder display.

The relatively large depth of field generated by a 24mm lens means focus accuracy isn't that critical. The lack of autofocus is therefore less of an issue in this lens than with, say, a standard or telephoto optic. A clear plus point is that the large manual focus ring of the Samyang is wonderfully smooth, comfortable and precise in operation, so manual focusing certainly isn't the chore you might expect it to be.

PERFORMANCE

The Samyang makes the most of its two aspherical elements, four ED elements and UMC coatings to deliver pleasing image quality. The only negative is that sharpness is a little poor at apertures between f/1.4 and f/2.8, but it's no worse at the corners of the frame than at the centre. Vignetting is also noticeable at f/1.4, but no more so than with the Canon lens.



Tech focus...

13 elements in 12 groups; 8 diaphragm blades; closest focus distance, 25cm; 77mm filter thread; manual focus only; 83 x 98mm; 580g

FEATURES

★★★★★

BUILD QUALITY

★★★★★

IMAGE QUALITY

★★★★★

VALUE

★★★★★

OVERALL

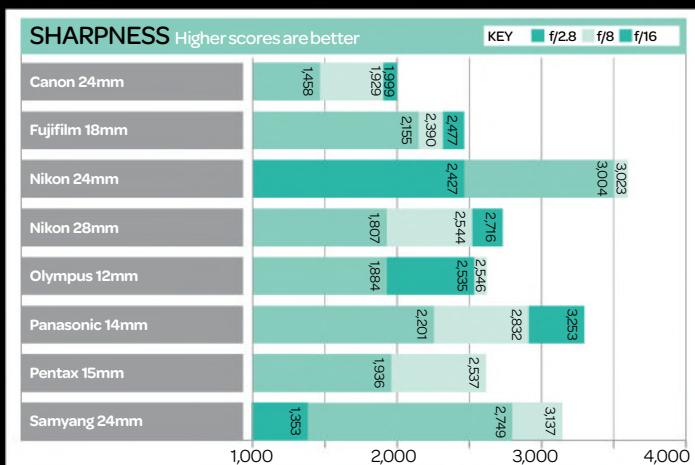
★★★★★

LENS BENCHMARKS

How the lenses fare in our lab tests

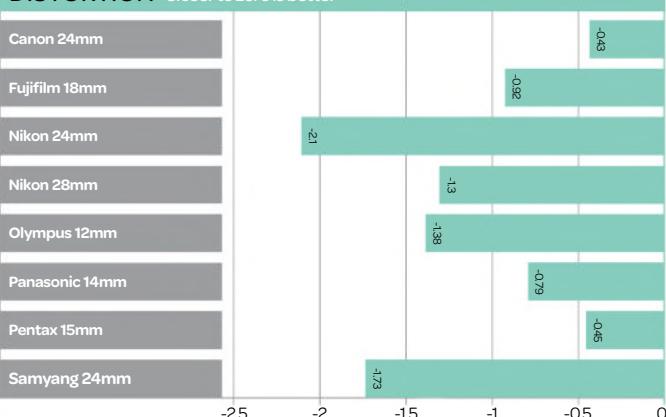
Most lenses in the group give an 'effective' focal length of either 24mm or 28mm in full-frame terms, with a viewing angle of about 84 degrees or 75 degrees respectively. The Pentax is a little wider, equivalent to a 22.5mm lens with a viewing angle of 86 degrees. Barrel distortion isn't necessarily more pronounced for lenses that have wider viewing angles. Similarly, lenses with narrower viewing angles don't necessarily perform better in terms of sharpness or colour fringing.

Some lenses struggle to deliver high levels of sharpness across the entire image frame, especially at their widest aperture settings. The Pentax lens in particular has problems with this, despite having the narrowest maximum aperture of any lens in the group, at f/4. Overall sharpness tends to peak at medium apertures of around f/5.6 to f/11, dropping off at f/16 due to diffraction, which is entirely normal at narrow apertures.



The Nikon 24mm and Panasonic 14mm lenses are particularly impressive for sharpness, but the pricey Canon 24mm is comparatively lacklustre

DISTORTION Closer to zero is better



The Canon 24mm and Pentax 15mm lenses do best at minimising barrel distortion, despite offering some of the widest viewing angles in the group

FRINGING Lower scores are better

	f/2.8	f/8	f/16
Canon 24mm	1.42	1.54	1.6
Fujifilm 18mm	0.89	2.87	3.07
Nikon 24mm	0.23	0.29	0.33
Nikon 28mm	0.36	0.37	0.2
Olympus 12mm	1.41	1.67	1.72
Panasonic 14mm	0.46	0.64	0.79
Pentax 15mm	N/A	1.5	1.59
Samyang 24mm	0.39	0.18	0.21

The Nikon 24mm and 28mm lenses lead the way for controlling colour fringing, along with the Samyang 24mm lens

HOW THE LENSES COMPARE

	Canon EF 24mm f/1.4L II USM	Fujifilm Fujinon XF18mm f/2 R	Nikon AF-S 24mm f/1.4G ED	Nikon AF-S 28mm f/1.8G	Olympus M.ZUIKO DIGITAL ED 12mm f/2	Panasonic Lumix G 14mm f/2.5 ASPH II	Pentax HD DA 15mm f/4 ED AL Limited	Samyang 24mm f/1.4 ED AS IF UMC
Contact	www.canon.co.uk	www.fujifilm.co.uk	www.nikon.co.uk	www.nikon.co.uk	www.olympus.co.uk	www.panasonic.com/uk	www.pentax.co.uk	www.samyang.co.uk
Street Price	£1,195 / \$1,550	£380 / \$370	£1,465 / \$1,930	£495 / \$695	£500 / \$800	£280 / \$395	£500 / \$476	£550 / \$600
Mount options	EF	X	FX	FX	MFT	MFT	K	EF FT FX K NX A E
Autofocus motor	Ultrasonic (ring)	Micro-motor	Ultrasonic (ring)	Ultrasonic (ring)	Stepping motor	Stepping motor	None (via camera drive)	None (manual focus only)
Minimum focus distance	25cm	18cm	25cm	25cm	20cm	18cm	18cm	25cm
Viewing angle range	84 degrees	76.5 degrees	84 degrees	75 degrees	84 degrees	75 degrees	86 degrees	84 degrees
Filter size	77mm	52mm	77mm	67mm	46mm	46mm	49mm	77mm
Lens hood	Yes	Yes	Yes	Yes	Optional extra	No	Yes	Yes
Dimensions (DxL)	80x87mm	65x41mm	83x89mm	73x81mm	56x43mm	56x21mm	63x40mm	83x98mm
Weight	650g	116g	620g	330g	130g	55g	189g	580g
FEATURES	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
BUILD QUALITY	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
IMAGE QUALITY	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
VALUE	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

KEY: EF Canon EF X Fujifilm X F Nikon F FX Nikon FX FT Four Thirds MFT Micro Four Thirds K Pentax K NX Samsung NX A Sony A E Sony E

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FAMILY PHOTO MASTERCLASS

We go behind the scenes of a location shoot with Nikon ambassador Kate Hopewell-Smith

CORE SKILLS

BEGINNER'S GUIDE TO SHOOTING VIDEO

Nikon guru Michael Freeman guides you through the basics



I started out I took photos through a pair of binoculars. You hold the binoculars up carefully to the lens to get a shot,"
Sagar, cricket photographer p106

CLASSIC LENS
Why we love Nikon's 70-200mm f/2.8 p95



FULL FRAME
Thinking of going FX?
Read this first! p97

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BORN TO BE WILD

Our experts hunt out the most attractive and affordable lenses for shooting wildlife, with long focal lengths to help cover the distance





THE ENTRY LIST

- 1 Canon EF 100-400mm f/4.5-5.6L IS USM £1,053 / \$1,500
- 2 Canon EF 400mm f/5.6L USM £929 / \$1,250
- 3 Nikon AF 80-400mm f/4.5-5.6D VR £940 / \$1,440
- 4 Nikon AF-S 80-400mm f/4.5-5.6G ED VR £1,900 / \$2,700
- 5 Panasonic 100-300mm f/4-5.6 Lumix G Vario £390 / \$600
- 6 Sigma 50-500mm f/4.5-6.3 DG OS HSM £1,000 / \$1,500
- 7 Sigma 150-500mm f/5-6.3 DG OS HSM £700 / \$710
- 8 Sony 70-400mm f/4-5.6 G SSM II £1,360 / \$2,200

MOUNT KEY



See which lens is available for your camera with this handy key.
C: Canon mount; N: Nikon; 4/3: Four Thirds; P: Pentax;
S: Sony; Sg: Sigma

Wildlife is wild by definition. A long lens, helping you maintain a respectful distance, is all but essential. Depending on what creatures you're photographing, you'll be able to get your shots without scaring them away or getting eaten in the process.

Going a step further than budget 70-300mm lenses, super-telephotos typically have focal lengths of 400mm, 500mm or even longer. If you happen to be sitting on a small fortune, there are some seriously upmarket lenses to choose from. Prominent examples include the latest Nikon and Canon 500mm f/4 lenses, which cost an eye-watering £6,000 and £8,000 respectively. For an even more bonkers amount of money, there's the zooming Canon EF 200-400mm f/4L IS USM with Internal 1.4x Extender, at £10,500.

To keep the choice down to earth, we've set a limit of £2,000 for the lenses in this group test – including a few at less than half that price.

THE CROP FACTOR

Compared with monster prime and zoom lenses, all the models on test are manageable enough for at least short bursts of handheld shooting. In most cases, however, a tripod or monopod helps to bear the load for extended sessions. As such, all the lenses on test (apart from the Panasonic) come complete with a tripod mounting collar and foot. These are good not only for balancing relatively heavy lens and camera combinations, but also retain the balance in portrait orientation (upright) shooting.

All the lenses on test (again, apart from the Panasonic) are full-frame compatible. However, the crop factor of APS-C cameras gives a boost in telephoto shooting. For example, on a Nikon, Pentax or Sony body, the 1.5x crop factor delivers an effective focal

Shop smart New Tamron telephoto

On sale for around £950, the Tamron SP 150-600mm f/5-6.3 Di VC USD is an intriguing newcomer in the super-telephoto market. Tamron was unable to supply a review sample for this group test, but here are the highlights. As with most of the lenses on test, it's

compatible with full-frame bodies, but goes that bit further to 600mm at the long end of the zoom range. Other attractions include ring-type ultrasonic autofocus and Tamron's proprietary Vibration Compensation optical stabilisation system. Size

and weight are similar to the Sigma 150-500mm lens at 105x258mm and 1.95kg, although the lens' filter attachment thread is bigger at 95mm.

It's available in Canon, Nikon and Sony mount options, the last of which omits the optical stabiliser.



The new Tamron SP weighs in at just under 2kg with the tripod mount attached

“All the models on test are manageable enough for at least short bursts of handheld shooting”

length of 750mm when using a 500mm lens. There's an even greater effective reach on Canon bodies, equating to 800mm.

The Panasonic lens is a Micro Four Thirds format optic, cameras in this system having a 2.0x crop factor. We've therefore included the relatively tiny, lightweight Panasonic 100-300mm lens in the test group, as it gives an effective reach of up to 600mm. All of the lenses on test are

With thanks...

To Exmoor Zoo for allowing us to take our opening image there. If you'd like to get up close with some of the animals, this is the place to go! Go to www.exmoorzoo.co.uk for info

zooms, apart from the Canon 400mm f/5.6L prime lens.

HOW FAST?

When you're after a long super-telephoto lens at a sensible price, size and weight, one thing you won't get is a particularly wide maximum aperture. Most are limited to f/5.6 at the long end of the zoom range, apart from the two Sigma lenses which are slightly narrower still, at f/6.3. To enable reasonably fast shutter speeds, often needed to freeze action in wildlife photography, you can find yourself having to use the widest available aperture, even when bumping up the camera's ISO setting.

How we test lenses Advice you can trust

Our lens tests are based on a two-stage procedure. First, lab tests are carried out, shooting two test charts under controlled lighting conditions. The results are processed using Imatest Master, so that we can quantify optical performance in terms of sharpness, chromatic aberrations and

distortion. Overall quality is assessed at the centre, edge and corners of the images.

We then use each of the lenses under widely varying indoor and outdoor lighting conditions. Handling is checked, along with smoothness and precision of zoom and focus rings, and the operation of all switches.

We also test the speed and accuracy of autofocus systems. The effectiveness of optical stabilisation systems, where fitted, is checked by gradually reducing shutter speeds during handheld shooting. Ratings are finally given for features, build quality, image quality and value for money.

The 'wide-open' performance of this type of lens is therefore an important factor, as you may not get the luxury of narrowing the aperture by a stop or two to optimise image quality.

Camera-shake is another inherent problem when using long lenses. The rule of thumb is that the shutter speed should be at least the reciprocal of the focal length. With an effective focal length of 800mm, you'd therefore need a shutter speed of 1/800 second or faster for consistently sharp handheld shots. To improve matters when shooting handheld or even using a monopod, many lenses in this group feature optical stabilisation. In other cases, anti-shake aid is left to sensor-shift stabilisation in the camera body, or isn't available at all.

SHARP SHOOTING

Mirror-bounce is another factor that can zap sharpness in super-telephoto shooting with conventional SLRs. It's the same problem as when using a macro lens for extreme close-ups: the jarring action of the mirror flipping up can unsettle the camera, particularly when using a tripod, and even the slightest movement can have a major effect.

Using an exposure delay mode or mirror lockup function is an effective solution, but only really practical if you're photographing wildlife that isn't moving around, or you're trying to capture a definitive moment. Fast shutter speeds are usually a better remedy.

Speed is also an issue when it comes to autofocus. When you only have the briefest of moments to acquire focus, or you need to track moving animals, fast autofocus is a must. Ring-type ultrasonic autofocus generally has the best reputation for speedy performance, but it's not the full story.

Another big contributing factor is how the internal lens elements are moved during focusing. Inner-focus systems where the smaller, rear elements are moved tend to be much quicker than those in which the relatively big and heavy front elements are moved. This is especially true for big telephoto lenses. In this test group, all lenses have an inner, rear-focusing design, apart from the older D-mount edition of the Nikon 80-400mm VR.

EQUIPMENT KNOW-HOW

FEATURES TO LOOK FOR

Keep an eye on the specifications when buying

Zoom or prime?

In this price bracket, zoom lenses are much more widely available than prime lenses. The versatility of a zoom is good to have, especially if you're limited to a fixed shooting position.

Size and weight

Super-telephoto lenses tend to be quite big and weigh up to 2kg. The physical length generally extends considerably when using the lens towards the long end of its zoom range.

Optical stabilisation

Newer generations of optical stabiliser are often about one f/stop more effective than older designs. Many of them feature automatic or manually selected panning modes.



Wide apertures

None of the zoom lenses in this test group has a constant-aperture design. The widest available aperture typically shrinks from f/4 or f/4.5 at the short end to f/5.6 or f/6.3 at the long end.

Weather seals

Weather seals are absent from nearly all of the lenses in this group test, which can be an issue when it comes to wildlife photography. The newer Nikon 80-400mm G-mount lens is best in this respect.

Autofocus system

Most of the lenses in this group feature ring-type ultrasonic autofocus. The exceptions to this are the Panasonic which has a stepping motor, and the older Nikon 80-400mm D-mount edition.

Explained Teleconverters

One way to boost telephoto reach even further is to fit a teleconverter. Popular options give a 1.4x or a 2.0x magnification of focal length. However, these reduce the widest available aperture by one or two f/stops respectively. Given that many cameras can't

autofocus with a widest available aperture of f/8 or narrower, it means you'll often be limited to manual focus only. Most budget 70-300mm telephoto zoom lenses are incompatible with teleconverters, because the rear element isn't sufficiently recessed within the lens barrel.



CANON EF 100-400MM F/4.5-5.6L IS USM £1,053 / \$1,500

A rather oddball and dated design

Originally launched in 1998, the EF 100-400mm foregoes a zoom ring in favour of a trombone-style push/pull design. You simply push the outer barrel of the zoom ring forwards to increase the focal length, and pull it backwards for reduction. It works reasonably well in practice, although some care is needed not to adjust the zoom setting accidentally during handheld shooting, especially when panning. At least there's an additional ring for adjusting the friction of the mechanism, which also helps to avoid zoom creep in tripod-mounted shooting.

This lens isn't weather-sealed, but overall build quality feels robust. An early generation of image stabiliser is rated at three stops, and features a panning mode that can be manually selected via a switch on the barrel. There's also a focus limiter switch, which locks out the short end of the range between 1.8 and 6.5 metres.

Quality glass includes top-grade fluorite and Super UD (Ultra-low Dispersion) elements. There are eight blades, which help to give a well-rounded diaphragm to enhance bokeh.

PERFORMANCE

As is typical in Canon's L-series telephoto lenses, autofocus is fast and accurate. The image stabiliser gave only a two-stop advantage in our tests, so is therefore rather less effective than in some of the more recent stabilised lenses. Image quality is very good, with impressive sharpness and contrast throughout the entire zoom range, even at the widest available apertures.



Tech focus...
17 elements in 14 groups, 8 diaphragm blades, closest focus distance 180cm, 77mm filter thread, ring-type ultrasonic autofocus, physical dimensions 92x189mm, weight 1,380g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★

CANON EF 400MM F/5.6L USM £929 / \$1,250

A prime lens with a long heritage

The only prime lens here, the Canon 400mm is also the oldest, with a design that stretches back over 20 years. You could argue that Canon is taking an 'if it ain't broke, don't fix it' approach, but the lens would benefit from an update.

It lacks the weather seals of most recent L-series lenses, and the lack of image stabilisation is a disadvantage, especially given that the widest available aperture isn't exactly fast at f/5.6. On the plus side, while Canon often doesn't supply lens hoods with its lenses, this one has a built-in retractable hood that makes it impossible to lose.

Extras include a tripod mounting collar and foot, a distance scale under a viewing window, and an AF/M focus mode switch. As with ring-type ultrasonic systems in other lenses, full-time manual override is available in One Shot autofocus mode. A focus limiter switch is also fitted to omit the short end of the focus range, between 3.5 and 8.5 metres. The large focus ring is smooth, precise and well-positioned.

PERFORMANCE

Despite being a prime lens, sharpness is no better than from Canon's EF 100-400mm zoom lens at the latter's longest zoom setting, although it exhibits less distortion and colour fringing. Even so, it's still one of the sharpest lenses in the group at this focal length. Autofocus is quick and near-silent. Overall, it's an attractive buy if you can live without stabilisation or the versatility of a zoom lens.



Tech focus...
7 elements in 6 groups, 8 diaphragm blades, closest focus distance 350cm, 77mm filter thread, ring-type ultrasonic autofocus, physical dimensions 90x257mm, weight 1,250g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★



NIKON AF 80-400MM F/4.5-5.6D VR £940 / \$1,440

Reasonably priced but a little dated

The very first Nikon SLR lens to feature Vibration Reduction, this D-mount edition was originally launched in 2000. As such, it's a relatively old stabilisation system and only gives a two-stop benefit. There are two VR modes, both of which benefit from automatic panning detection. One applies stabilisation only during exposures, the other shows the effect full-time in the viewfinder but increases battery drain.

There's a focus limiter switch and a ring for switching between auto and manual focus. A major compromise is that the lens has no internal autofocus motor. Instead, it's driven via a helical thread from motors built into Nikon full-frame SLRs and upmarket DX format bodies like the D7100, D300s and D90. The upshot is that autofocus is impossible on cameras like the D3300 and D5300.

Build quality is good overall but it lacks weather seals. Plus points include the fitment of three ED (Extra-low Dispersion) elements and a well-rounded nine-blade diaphragm.

PERFORMANCE

The large front element is moved forwards and backwards during focusing adjustments.

Coupled with the fact that it's driven by an in-camera motor, autofocus is painfully slow, especially in comparison to the ring-type ultrasonic systems used in most competing lenses. Image quality is good at short-to-mid-zoom settings, but sharpness drops off towards the long end of the zoom range.



Tech focus...
17 elements in 11 groups, 9 diaphragm blades, closest focus distance 230cm, 77mm filter thread, autofocus drive from camera, physical dimensions 91x171mm, weight 1,340g

FEATURES	★★★☆☆
BUILD QUALITY	★★★☆☆
IMAGE QUALITY	★★★☆☆
VALUE	★★☆☆☆
OVERALL	★★★☆☆

NIKON AF-S 80-400MM F/4.5-5.6G ED VR £1,900 / \$2,700

Twice the price – but twice as good

Some 13 years newer than Nikon's 80-400mm D-mount lens, this G-mount edition was launched last year and is bang up to date. The antiquated aperture ring has gone, and other areas are massively improved.

Its ring-type ultrasonic autofocus is not only fast and near-silent, but also enables full autofocus compatibility on all Nikon digital SLRs. It's bigger and heavier than the older lens, but the build feels more robust. It's also the only lens here to feature weather seals. There are four rather than three ED elements inside, plus an additional Super ED element.

The new-generation Vibration Reduction system gives as much as a four-stop bonus, making it more effective than the older lens's VR. It still features auto panning detection but adds normal and active modes. The latter is great if you're shooting wildlife on safari, from an idling or even moving vehicle. Trick autofocus modes include A/M and M/A, with priority being given to AF or manual focusing respectively, and there's also a fully manual option. Other extras include a zoom lock switch and a focus limiter.

PERFORMANCE

Along with excellent autofocus speed and accuracy, stabilisation performance is superb. This helps to deliver consistently sharp handheld shots even in tricky conditions, throughout the entire zoom range. Overall image quality is a sizeable step up from the older lens.



Tech focus...
20 elements in 12 groups, 9 diaphragm blades, closest focus distance 150cm, 77mm filter thread, ring-type ultrasonic autofocus, physical dimensions 96x203mm, weight 1,570g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★



PANASONIC 100-300MM F/4-5.6 LUMIX G VARIO £390 / \$600

A small but powerful MFT lens

Budget 70-300mm telephoto zooms tend to be reasonably compact, even though most are designed for full-frame cameras. This Micro Four Thirds optic only needs to deliver a relatively small image circle, enabling the design to be even smaller and lighter in weight. Meanwhile, the 2.0x crop factor of the Four Thirds system gives it an effective telephoto reach of 600mm.

Coupled with a similarly downsized body like the Panasonic GX7, you get the luxury of heading off into the wilds with the minimum impact on your carrying load. The combined weight of the GX7 and this lens is just 922g.

Build quality doesn't feel as rugged as in the more upmarket lenses on test, but this is reflected in the price. There's still plenty to impress, however, including the fitment of an ED (Extra-low Dispersion) element and a Mega OIS optical image stabiliser, which delivered a three-stop advantage in our tests.

PERFORMANCE

Contrast-detection autofocus systems and stepping motor actuators are both notorious for lacking speed. However, coupled with the GX7, AF performance proved reasonably quick in our tests. It's not as fast as the ring-type ultrasonic systems in most other lenses on test, but massively quicker than the D-mount edition of the Nikon 80-400mm.

Image quality is good overall but, as is often the case, sharpness drops away at the long end of the zoom range.



Tech focus...
17 elements in 12 groups, 7 diaphragm blades, closest focus distance 150cm, 67mm filter thread, stepping motor autofocus, physical dimensions 74x126mm, weight 520g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★

SIGMA 50-500MM F/4.5-6.3 DG OS HSM £1,000 / \$1,500

A worthy update to the first 'Bigma'

Nicknamed the 'Bigma', the chunky Sigma 50-500mm made its first appearance in 2005. This revamped edition was launched five years later, with a redesigned optical path and the addition of an image stabiliser. The new lens features four SLD (Special Low Dispersion) elements.

The stabiliser is fitted not only to the Canon and Nikon variants, but also to Pentax and Sony models. This gives users of the latter two camera body makes the option of in-camera, sensor-shift stabilisation or in-lens optical stabilisation (except in the Pentax *ist or the K100D). In-lens stabilisation usually works best for telephoto shooting, as well as enabling the effect to be seen through the viewfinder.

The extra-large zoom range can be a bonus in wildlife shooting, if you need to quickly zoom out to more standard focal lengths without the time to swap lenses. It also reduces the need to change lenses in outdoor environments.

Ring-type ultrasonic autofocus is fast and effective, but there's no focus limiter switch. At just under 2kg, it's the heaviest lens here – a side-effect of this is that it suffers from zoom creep, but at least there's a zoom lock switch.

PERFORMANCE

Sharpness is quite good, but the huge 10x zoom range brings higher than average distortion, switching from barrel distortion at 50mm to pincushion at mid-to-long zoom lengths. Overall, the new version is an improvement over the original, and good value at the price.



Tech focus...
22 elements in 16 groups, 9 diaphragm blades, closest focus distance 50-180cm, 95mm filter thread, ring-type ultrasonic autofocus, physical dimensions 104x219mm, weight 1,970g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★



SIGMA 150-500MM F/5-6.3 DG OS HSM

£700 / \$710

Big telephoto reach at a budget price

Coming to the market in 2008, roughly halfway between the two editions of the Sigma 50-500mm lens, this one sacrifices overall zoom range but retains the same 500mm maximum telephoto reach. It's a little longer and narrower than its 50-500mm sibling, and about 200g lighter in weight. Similarities include the same layout of switches for AF/M focus, dual-mode stabiliser for static and panning shots, and zoom lock. There's also the same lack of a focus limiter switch.

Both Sigma lenses have finger grooves in the tripod foot, which some photographers find comfortable to use in handheld shooting. Again, optical stabilisation can be used on the same range of Pentax and Sony cameras, as well as in the Canon and Nikon editions. SLD (Special Low Dispersion) elements are included, but this time there are only three rather than four. At the front, the filter thread is 86mm compared with 95mm on the 50-500mm lens.

PERFORMANCE

This lens delivers more sharpness in the 150-400mm section of the zoom range. However, sharpness drops off slightly more at 500mm. Distortions are less noticeable, with modest pincushion rising gradually from 150mm to 500mm settings. Colour fringing is also reduced, making this cheaper Sigma a great buy. It's always been a favourite in terms of value for money, but is likely to face competition from the new Tamron 150-600mm lens.



Tech focus...
21 elements in 15 groups, 9 diaphragm blades, closest focus distance 220cm, 86mm filter thread, ring-type ultrasonic autofocus, physical dimensions 95x252mm, weight 1,780g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★



SONY 70-400MM F/4-5.6 G SSM II

£1,360 / \$2,200

Improved with faster autofocus

This updated version of the original Sony 70-400mm was launched last year. The white finish remains, and improvements in most respects aren't easy to spot. Optical stabilisation certainly hasn't been added – no big surprise given that Sony favours sensor-shift stabilisation in its SLR and SLT cameras.

The SSM (Super Sonic wave Motor) autofocus has been redesigned and upgraded; Sony claims a four-fold increase in speed. There's also the addition of Nano AR (Anti-Reflective) coatings on all optical surfaces, helping to keep ghosting and flare to a minimum. Overall build quality remains sturdy.

The lens boasts three focus lock buttons around the mid section of its barrel. These fall naturally under the fingers, whichever orientation you're shooting in. A focus limiter switch is also fitted, enabling you to lock out the short end of the range between 1.5-3m.

Handling is refined, with a silky smooth action to the zoom and focus rings, and no hint of zoom creep. Given the fairly steep price of the lens, however, weather seals would have been a useful addition.

PERFORMANCE

Autofocus speed is a marked improvement over the original lens, but it's not noticeably quicker than in other lenses that also feature ring-type ultrasonic systems. Image quality is sharp throughout the zoom range, with good levels of contrast even at the widest available apertures.



Tech focus...
18 elements in 12 groups, 9 diaphragm blades, closest focus distance 150cm, 77mm filter thread, ring-type ultrasonic autofocus, physical dimensions 95x196mm, weight 1,500g

FEATURES	★★★★★
BUILD QUALITY	★★★★★
IMAGE QUALITY	★★★★★
VALUE	★★★★★
OVERALL	★★★★★

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Panoramic & geared heads

Panoramas help you show the bigger picture, and it's surprisingly simple to create them with one of these...



1 Manfrotto 300N

Price: £124 / \$245
Web: www.manfrotto.co.uk

The 300N may not look like much, but it's a precision device. The holes around the main body accept a selector screw, so when you pan the head, it clicks into place at anywhere between 5- and 90-degree intervals. The setting depends on your lens' field of view and focal length. Don't forget to add an overlap between shots to help your stitching software.

The 300N's quality build is reflected in its premium price tag, and you'll need to top it off with a conventional head or mounting plate. It's also possible to get similar panoramic results with a regular pan head if you're careful, but don't discount the 300N: it has plenty to offer.

What's good: Beautifully engineered and satisfying to use for single-row pans

What's bad: Expensive, with limited versatility if used on its own

Our verdict: A fine panorama head base, but it really needs extra kit to shine

VERDICT ★★★★☆

2 Manfrotto MH057A5-Long

Price: £330 / \$750
Web: www.manfrotto.co.uk

Shooting a landscape panorama is easy, but try capturing a closer vista and you'll run into problems. Simply panning your camera around its mounting point can skew perspective and cause stitching artefacts. The answer is to position the camera so that closer objects don't appear to move relative to the background scene.

This perfect spot is the nodal point – and setting it is easy with this kit's twin-axis sliding rails and precisely geared dials. You still need a pan base, but the 300N (left) is included in this kit's price. They'll give you perfectly aligned shots for near and far panoramas.

What's good: Great for precision pans and close-up subjects

What's bad: Isn't capable of generating spherical panoramas

Our verdict: Complete control, but ultimately limited to single-row panoramas

VERDICT ★★★★☆

3 GigaPan Epic Pro

Price: £840 / \$995
Web: www.gigapan.com

The Epic Pro is an aid to help you create huge panoramas that run into the gigapixels – that's over 1,000 megapixels! You don't have to mess about with dials and sliders to take the hundreds of photos needed to compile such an immense image. The Epic Pro is an automated electronic platform and includes remote shutter release cables. All you need to do is set up where you want the pan to start and finish, and program your lens' field of view.

The process is surprisingly quick and you get complementary stitching software thrown in, but a powerful computer is a must. Once the image is stitched, sit back and savour.

What's good: Creates stunning results with minimal user input

What's bad: Big and bulky; is your tripod up to the job?

Our verdict: It's the daddy of automated panorama capture

VERDICT ★★★★★



4 Nodal Ninja 3 Mk II Starter Package

Price: £124 / \$190

Web: <http://shop.nodalninja.com>

Even if you shell out for the Manfrotto pan head combo, you're still limited to single-axis panoramas. The fun begins with 360x180-degree spherical pans, which is where the Nodal Ninja comes in. Thanks to its rotating vertical arm, you can tilt your camera up and down as well as side to side.

Use a fisheye or a wide-angle lens, and you can capture a virtual environment from the sky down to your feet in six shots. All essential hardware is included in the Starter Package version. You'll need to stick to a small or medium-sized camera, but this is great value.

What's good: Compact, easy to use and it won't break the bank

What's bad: Not large enough to support a full-frame camera

Our verdict: The perfect introduction to panoramic photography

VERDICT ★★★★☆

5 Manfrotto 410 Junior Geared Head

Price: £140 / \$235

Web: www.manfrotto.co.uk

Geared heads are great for panoramas, but are also good for any shot requiring compositional control. The 410 has three knobs that will wind your camera precisely around a 360-degree pan, as well as tilting it vertically and laterally.

The substantial aluminium construction oozes quality and contributes to the head's 1.22kg bulk, although it's well up to handling a full-frame camera with a serious lens. You don't get any nodal point adjustment, so close-range panoramas may not stitch together correctly. Unlike the 300N, the 410 can't be configured to click into place at set intervals.

What's good: Supreme quality and a real pleasure to use

What's bad: Not ideally suited to close-range panoramas

Our verdict: An ultra-precise head for more than just panoramas

VERDICT ★★★★☆

6 Syrp Genie

Price: £700 / \$795

Web: www.syrp.co.nz

With motorised rotation and an intervalometer, the Genie enables you to create stunning time-lapse sequences as it pans. From rush-hour cityscapes to celestial star trails, the Genie will capture it with ease. The battery life is approximately seven hours, and the LCD menu display and presets make it easy to use.

The device has no external batteries or wires – simply screw it in between your tripod and ball head. Alternatively, mount the Genie on a slider, and the motor in the base will wind it along a rope to create linear as well as panning time-lapses. It will even pull itself along a makeshift dolly such as a skateboard.

What's good: A small and simple gadget that works wonders

What's bad: Not intended for multi-row or spherical panoramas

Our verdict: Takes panoramic photography to a whole new level

VERDICT ★★★★☆



1



2



3

Filter systems

Thought filters died with film? Think again, because a decent filter kit can still work wonders. We try out six of the best

1 Cokin Snap! Starter Kit

Price: £14 / \$74

Web: www.cokin.co.uk

This cute little kit is ideal if you've got a compact system camera and fancy experimenting with filters. The kit can be supplied with adaptor rings between 37mm and 52mm, which suits most CSC lenses as well as some entry-level SLR kit optics. A three-slot holder enables some multi-filter creativity.

Two filters from Cokin's 140-strong A-Series range are included. A soft graduated warming filter helps create balanced sunset exposures, although you'd get more colour control using a graduated ND filter and tweaking tones in software. There's also a regular ND4 filter that's more versatile, letting you blur moving subjects.

What's good: Great ND performance and plenty of scope to expand

What's bad: The small size limits compatibility to CSC and basic SLR lenses

We say: A good value, space-saving starter kit with room to grow

VERDICT ★★★★☆

2 Cokin Landscape Kit 1

Price: £40 / \$67

Web: www.cokin.co.uk

So you've composed a stunning landscape shot, only to find it ends up looking bland or washed out. That's where this kit comes in handy. There's a blue-to-clear graduated filter that's ideal for restoring colour saturation to a bright sky, and a graduated warming filter to spice up a sunset. A conventional warming filter completes the trio and adds a retro vibe. All are 84mm-wide P-Series standard and will cover up to an 82mm lens.

Each filter works well and helps you get attractive shots. But you'll get more control with software, and a graduated ND filter is better for preventing blown-out skies.

What's good: A selection of quality filters at a reasonable price

What's bad: Similar effects are achievable in software post-processing

We say: Good for traditionalists, but now superseded by software

VERDICT ★★★★☆

3 Formatt Hitech 100mm Premier Landscape Filter Kit

Price: £355 / \$599

Web: www.formatt-hitech.com

Photographer Colby Brown helped assemble this landscape filter kit. A soft graduated ND4 filter keeps bright skies in check, or if you're shooting a very low sunset, the ND4 reverse grad cuts out light across its centre. Both deliver great results; the 10mm circular polariser also performs flawlessly.

Finally there's the ProStop IRND 6 which reduces light transfer by six stops to create super-smooth sea and skylapses. Our test example introduced an obvious blue colour shift. A replacement was far better, indicating an isolated issue with an otherwise excellent kit.

What's good: A good mix of professional quality filters for outdoor shooters

What's bad: A serious investment; possible quality control issues

We say: A carefully considered kit for creating stunning landscape shots

VERDICT ★★★★☆



4 Lee Filters Neutral-Density Hard Grad Set

Price: £200 / \$250

Web: www.leefilters.com

Lee Filters' hand-made filters have a reputation for quality, and this set is no exception. Only the darkest ND8 filter in this trio exhibited a trace of a colour cast when shooting a white card, with the ND4 and ND2 filters performing perfectly. All three are ideal for balancing high-contrast landscapes by blocking up to three stops of light. Thanks to their large 100-x-150mm size, you get plenty of composition control.

The filters themselves are pretty pricey, and you'll need to fork out an extra £54 / \$88 for Lee's Foundation Kit filter holder, plus around £19 / \$28 for a lens adaptor ring.

What's good: First-class optical quality and big enough to suit most compositions

What's bad: Expensive, especially if you're starting from scratch

We say: This kit and its accessories aren't cheap, but the filters are hard to beat

VERDICT ★★★★☆

5 Kood P-Type ND Filter Kit

Price: £44 / \$67

Web: www.premier-ink.co.uk

Neutral-density filters are great for increasing dynamic range or reducing shutter speeds. This kit has ND2 and ND4 densities in both full and soft graduated styles. Individually they only block up to two stops of light, but stack two together and the results are more dramatic.

Multiple kits are available to suit all standard lens sizes. You needn't worry about upgrade compatibility, as the 82mm filter size and holder match the popular P-Series dimensions.

We found the ND4 filters introduced a noticeable blue colour cast, but it's nothing software can't correct, and it doesn't stop the kit being exceptional value for money.

What's good: A useful filter selection at a terrific price

What's bad: The darker filters are prone to introducing colour casts

We say: Unbeatable value if you're not expecting optical perfection

VERDICT ★★★★☆

6 SRB P Size ND Soft Grad Starter Kit

Price: £25 / \$39

Web: www.srb-photographic.co.uk

Like Kood, SRB adopts the 82mm P-Size filter format for a good balance of portability and lens coverage. There's only a single filter to get you going, but it's a versatile ND4 soft grad. And with extra filters starting at £12.50 / \$20.77 a piece, expanding the kit needn't break the bank.

SRB throws in a three-filter holder, a cleaning cloth and a storage wallet for eight filters. All you have to do is choose an adaptor ring, with 49mm to 82mm thread sizes available.

Considering the budget price, the optical quality was fairly good, with only a slight blue colour cast at the darkest point.

What's good: Good performance and versatility for the money

What's bad: These aren't the most neutral filters in this test group

We say: This is a sensible starter kit that's easily upgradeable

VERDICT ★★★★☆

Circular polarisers

Perennially popular, these filters enable crafty in-camera effects, some of which simply can't be replicated in Photoshop



1 Hoya Pro1 Digital

Price: £42 / \$63 (77mm fitting)
Web: www.intro2020.co.uk

Typical of Hoya's Pro1 Digital range of filters, the circular polariser features black-rimmed glass mounted in a matte-black finished aluminium frame. This, in addition to multi-coatings on the filter glass itself, offers good resistance to ghosting and flare caused by unwanted reflections. Further attractions include a low profile design and a UV-resistant carrying case.

The Hoya produces negligible overall colour shift and, when rotated for maximum effect, gives a typical two-stop reduction in exposure value. Build quality is good with easy fitment and the operating ring adjusts and easily, despite the thinness of the low-profile design.

What's good: Slim design; good quality construction; relatively inexpensive

What's bad: Glass and coatings lack the top-flight quality of some competitors

Our verdict: It's an excellent buy at the price and wins out for value for money

VERDICT ★★★★☆

2 Cokin P-series P164

Price: £70 / \$110 (77mm fitting)
Web: www.cokin.co.uk

Cokin's range of P-series filters is renowned for being sensibly priced and offering a variety of effects, with some 140 creative filters to choose from. Most are square or rectangular, measuring 84mm in width, and mount via a P-series filter holder, which costs around £12 / \$15. Adaptor rings are available for lenses with attachment threads of between 48 and 82mm, which cost about the same as the filter holder itself. The P164 filter has a round design and fits into the rear slot of the filter holder.

The plastic holder feels a bit flimsy compared with the Formatt-Hitech and Lee Filters holders, but this is reflected in the price.

What's good: Reasonably priced; compatible with the Cokin P-series system

What's bad: Optical quality isn't as good as with the cheaper Hoya Pro1 Digital

Our verdict: It's a good option if you've already bought into Cokin P-series filters

VERDICT ★★★★☆

3 Hoya Revo

Price: £96 / \$150 (77mm fitting)
Web: www.intro2020.co.uk

Nearly twice the price of the Hoya Pro1 Digital, this recently launched filter is from Hoya's new Revo range. Mechanical design and build quality feels identical, with the same low profile dimensions, black rimmed glass, matte black aluminium frame and UV-resistant case.

The main difference is that the Revo filter uses upgraded glass and coatings. Hoya claims the high-precision optical glass is specially smelted and blended to yield perfect results, and that the improved Super Multi-Coating is more effective in eliminating reflections. The coatings are overlaid with an extra water and stain-resistant coating, which is easier to clean.

What's good: Premium glass and coatings; slim design; very good build quality

What's bad: Much more expensive to buy than Hoya's Pro1 Digital filter

Our verdict: The anti-reflective coatings are very good, and justify the higher price

VERDICT ★★★★★



4 B+W XS-Pro MRC Nano

Price: £175 / \$153 (77mm fitting)

Web: www.bpluswfilters.co.uk

Like Hoya, B+W offers standard and premium options of circular polariser filters. The more basic B+W F-Pro MRC costs about £110 / \$145, and has a standard range of multi-coatings and a thick profile. This XS-Pro Nano edition features uprated coatings that are extremely anti-reflective, hard-wearing, water and dirt-repellent and easy to clean. High-quality Schott glass is encompassed by a brass frame, which has a matte-black finish.

While the ultra-thin profile makes vignetting unlikely, the downside is that the adjustment ring is tricky to operate. The B+W adds a slightly warm colour shift that is absent in the Hoyas.

What's good: Sturdy brass frame; ultra-low-profile design to avoid vignetting

What's bad: Adjustment ring is a bit fiddly to operate; slightly warm colour shift

Our verdict: Very good quality, but operation can be a challenge for big fingers

VERDICT ★★★★☆

5 Formatt-Hitech 95mm

Price: £180 / \$290 (85mm fitting)

Web: www.formatt-hitech.com

One thing this filter has in common with the B+W is that they're both made of high-quality Schott optical glass. In other respects, they're rather different. The Formatt-Hitech is designed to be used with square filter holders of varying sizes. The 95mm filter is compatible with the company's 85mm filter holder, which is also compatible with Cokin P-series filters.

In addition to the filter, you'll need a filter holder ring at £16 / \$25, and an 85mm modular filter holder at £28 / \$45. Both are made of aluminium and have a high standard of build quality. An adaptor ring for fixing the entire assembly to your lens costs about £12 / \$18.

What's good: The filter holder, filter and attachment ring all have top build quality

What's bad: Expensive once you add the price of the various extra components

Our verdict: A quality system that'll accept other Formatt-Hitech and P-series filters

VERDICT ★★★★☆

6 Lee 105mm Rotating Filter

Price: £228 / \$300 (105mm fitting)

Web: www.leefilters.com

Lee offers two circular polariser options for its square filter system. The cheaper one (£160 / \$220) is a 100x100mm filter that slots into the Lee Foundation Kit holder (available separately for £55 / \$88). However, because you have to rotate the entire holder to adjust the polarising effect, it can't be used with other directional-specific filters. The 105mm Rotating Filter is therefore a better option, but it requires a 105mm Accessory Ring for £35 / \$60.

The Lee has superb build quality and is impressive in optical terms. It's an excellent addition to existing Lee filters you may already have, but an expensive option in its own right.

What's good: Pro quality of construction; enables simultaneous use with Lee filters

What's bad: It's very pricey if you don't plan on using other compatible square filters

Our verdict: Quality glass and fittings suited to extending your 100mm square filters

VERDICT ★★★★☆

ND filters

Bright light isn't always a good thing.
Get some serious stopping power...



1 B+W MRC 3.0/1000x ND

Price: £94 / \$151 (77mm fitting)

Web: www.bplusfilters.co.uk

B+W offers two editions of its 10-stop ND filter. Both have a reassuring weight, owing to high-quality glass plus brass mounts. The MRC version, which we're reviewing here, features dirt, water and scratch-resistant multi-coatings instead of a single coating. Fitting the filter to our Nikon lenses with 77mm attachment threads proved fiddly but got easier over time. One thing that remained constant, however, is that the B+W gave a noticeable red tint to images captured on both the D7000 and D610 cameras we used for testing. Colour accuracy was actually much better from the Tiffen filter tested here, which costs far less money to buy.

What's good: Solid build, yet with a very low-profile design

What's bad: Noticeable red colour cast on both test cameras

Our verdict: It's expensive, so the colour inaccuracy is disappointing

VERDICT ★★★★☆

2 Formatt-Hitech Multistop ND

Price: £165 / \$232 (72mm fitting)

Web: www.formatt-hitech.com

The advertised stopping power of this variable density filter is less than that of the Light Craft Workshop filter, at two to six stops. In our tests, however, both gave practically identical maximum reductions at varying focal lengths. The overall build is quite chunky, based on a pair of rings, one fixed and one rotating. However, the front ring is larger in diameter than the rear one, which helps to avoid vignetting when attached to wide-angle lenses. The colour accuracy and overall image quality produced are practically identical to those of the less expensive Light Craft filter, but the Formatt-Hitech feels a little more robust.

What's good: Robust build and high-quality components

What's bad: Loses effectiveness with wide-angle lenses

Our verdict: Good value considering its upmarket build quality

VERDICT ★★★★★

3 Hoya Pro ND 1000

Price: £71 / \$121 (77mm fitting)

Web: www.intro2020.co.uk

Hoya filters have long been popular with photographers all around the world. A wide range of Pro ND filters are available in increments from two- to 10-stop options, each of which uses the same Metallic ACCU-ND type of coating. Hoya claims this yields a truly neutral colour balance without any noticeable colour casts and also maintains colour integrity between different strengths of filter. In our tests, we found the Hoya 10-stop filter gave the most accurate colour rendition of any filter here on both our cameras. Its profile isn't quite as slim as some of its rivals but we still didn't experience any vignetting.

What's good: Accurate colour balance; good metering with filter fitted

What's bad: Wider lens profile than other filters in the group

Our verdict: It's an inexpensive option that delivers stand-out results

VERDICT ★★★★★



4 Lee Big Stopper 100mm

Price: £100 / \$140 (without holder)

Web: www.leefilters.com

Unless you already use Lee 100mm filters, you'll also need to buy a Foundation Kit and adaptor ring, which can add up to £100 / \$120 to the price of this square filter. All components are engineered to a high standard, making it an attractive system. The Big Stopper filter itself has to be used in the rear tray of the filter holder, and has foam padding around its rear edge. This is to stop any stray light from entering through the top, bottom or sides. In our tests, the light reduction proved true to Lee's claims of 10 stops but our sample images, taken using both the D7000 and D610 cameras, had a noticeable green colour cast.

What's good: Image and build quality are both very good overall

What's bad: We experienced green colour casts on our images

Our verdict: Expensive if you also need to buy the mounting kit

VERDICT ★★★★☆

5 Light Craft Workshop Fader ND Mk II

Price: £100 / \$130 (77mm fitting)

Web: www.premier-ink.co.uk

The original version of this variable ND filter was very popular, and the new Mk II edition has been enhanced to avoid softening of images at long focal lengths, while also reducing vignetting with wide-angle lenses. However, the amount by which you can increase the effective density is diminished when you're using wide-angle lenses. Premier Ink, the UK distributor, is upfront about this, stating that while a reduction of up to nine stops is available at a 100mm focal length, this shrinks to as little as three stops at 12mm, before a dark cross begins to appear across the image.

What's good: Good image quality with minimal colour shift

What's bad: Limited stopping power with wide-angle lenses

Our verdict: It's very good value for a variable ND filter

VERDICT ★★★★☆

6 Tiffen IR ND 3.0

Price: £80 / \$90 (77mm fitting)

Web: www.tiffen.com

Tiffen's older standard ND 3.0 filter is a typical triple-density filter that gives the usual 10-stop light reduction. However, in our tests it gave a pronounced red colour cast when used on a D7000, and the effect was still noticeable to a lesser extent when fitted on a D610. According to Tiffen, the new IR Cut edition is specially engineered to reduce 'infra-red and far-red pollution'. We found it gave a much more neutral colour balance on both cameras. The standard of construction is very good, with a low-profile design to combat vignetting, even when used on ultra-wide lenses. The claimed 10-stop density is very accurate.

What's good: commendable colour accuracy; low-profile design

What's bad: Metering with the filter fitted tends to give dark images

Our verdict: Very good performance and excellent value

VERDICT ★★★★☆

Variable ND filters

Capture long exposures without systems using one of these screw-on variable ND filters

1 B+W ND-Vario MRC Nano 77mm

Price: £207 / \$270

Web: www.bpluswfilters.co.uk

More conservative than the other filters on test, the B+W allows a maximum of four stops exposure extension. But this is a quality filter that minimises any adverse effect on images.



4 Hama Grey Filter Vario ND2-400 77mm

Price: £40 / \$61

Web: www.hama.co.uk

This slimline filter has well-defined min to max markings. Four stops will give the best results; seven stops of exposure extension can be achieved, but will require some retouching.



2 Cokin Pure Harmonie ND X 77mm

Price: £88 / \$161

Web: www.cokin.co.uk

Arriving in a tough plastic case, this filter feels premium-quality. Six stops of exposure extension is possible, but images have colour casts. Using four stops provides clean results.



5 Hoya Variable Density 3-400 77mm

Price: £121 / \$130

Web: www.hoyafilter.com

This filter's clear markings and textured front ring make for easy adjustment. Seven stops of exposure extension is possible, with excellent image quality that requires little adjustment.



3 Gloxy ND2-ND400 MKII

Price: £44 / \$67

Web: www.digitaltoyshop.co.uk

Colour casts quickly encroach on the image as the intensity of the filter is increased – and to a greater degree than other filters on test. Eight stops of exposure extension can be achieved, but at the cost of colour and contrast.



6 Kenko PL Fader ND3-ND400

Price: £100 / \$100

Web: www.kenkoglobal.com

Featuring a small screw-in lever that fits to the front element, this filter is by far the easiest to adjust. Seven stops of exposure extension can be achieved, but colour casts are apparent; using four stops captures the best quality.



④



②



③



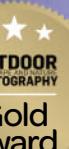
⑥



Best on
test



⑤



Gold
award



①

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Why settle for a basic remote shutter release when these cunning controllers give you so much more flexibility?

1 Hahnel Giga T Pro II

Price: £70 / \$96 **Web:** www.hahnel.ie

This compact remote boasts adjustable self-timer and dual time-lapse settings, plus single, continuous and bulb functions. The interface is complex, but offers wide-ranging control with wireless RF communication over 100m.



4 Phottix TR-90 Timer Remote

Price: £44 / \$52 **Web:** www.phottix.co.uk

Sturdy and well built without being bulky or too heavy, the TR-90 is a cable remote rather than a wireless affair. Neat control buttons and a four-way pad combine with an LCD info display, making it easy to set up self-timer, interval timer and long-exposure timer options.



2 Hama Wireless Remote DCCS

Price: £39 / \$92 **Web:** www.hama.co.uk

Compatible with many camera makes and models, thanks to a range of connecting cables. You can switch between single, continuous, self-timer and bulb options on the transmitter, but there are no facilities for time-lapse shooting.



5 Phottix Aion Wireless Timer Remote

Price: £75 / \$85 **Web:** www.phottix.co.uk

Has plenty of drive modes and programmable settings for time-lapse, self-timer and long exposure shooting, and even a bracketing feature for bulb exposures. Wireless range is a pretty respectable 60m.



3 ioShutter

Price: £15 / \$13 **Web:** www.ioshutter.com

Tethers your camera to an iPhone, iPad or iPod touch via an 80cm cable and interface unit. The downloaded app then enables straightforward and advanced shooting modes, direct from your Apple device.



6 Triggertrap Mobile Dongle

Price: £29 / \$35 **Web:** www.triggertrap.com

This dongle offers compatibility with both iOS devices and Android phones and gadgets. Additional connection cables are available. Clever features include multiple time-lapse modes, their signature DistanceLapse mode, long-exposure HDR and plenty more.



★★★★
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