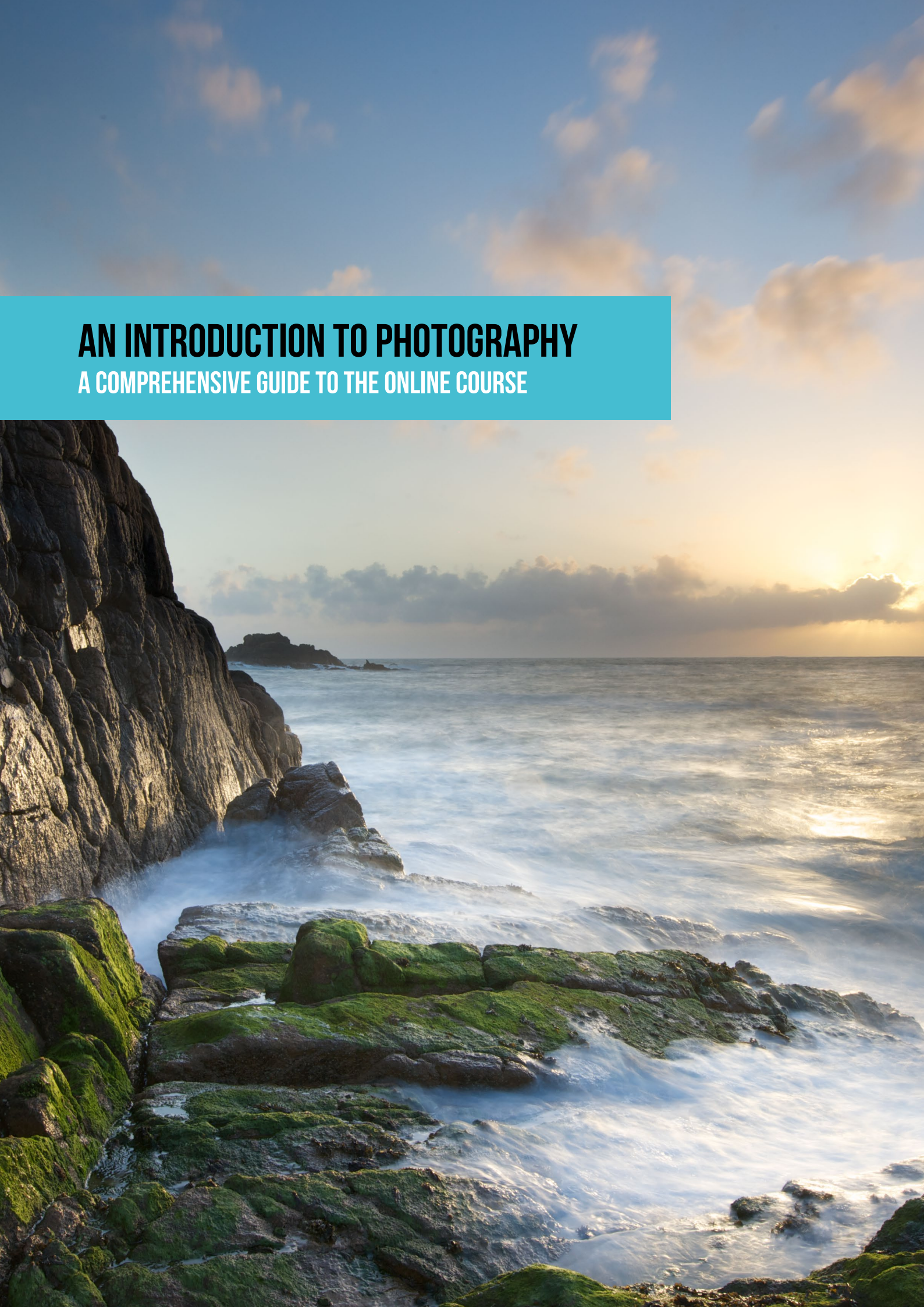
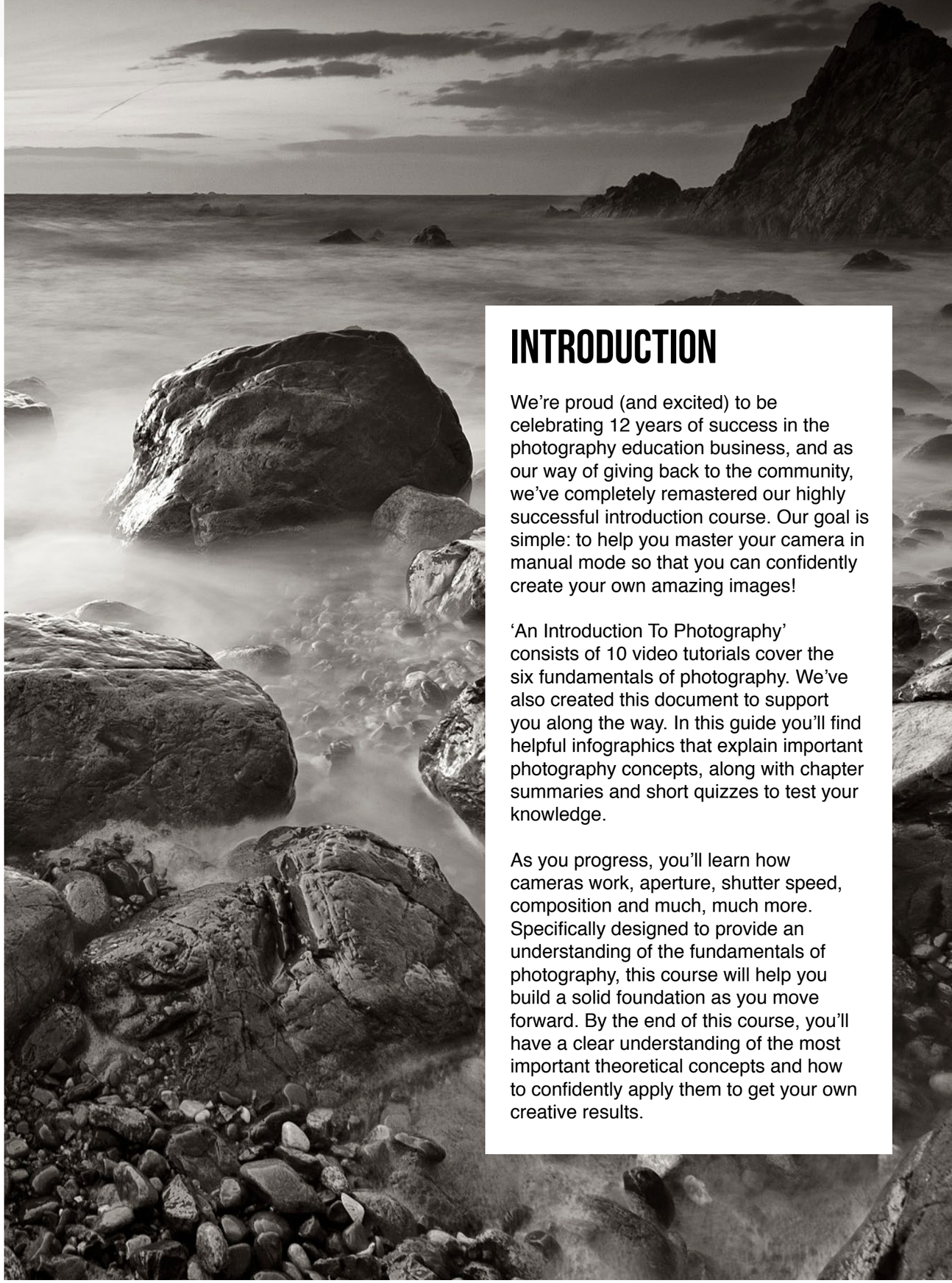
AN INTRODUCTION TO PHOTOGRAPHY

A COMPREHENSIVE GUIDE TO THE ONLINE COURSE



KARL TAYLOR EDUCATION

Karl Taylor is a professional commercial photographer with more than 20 years of experience in the industry. In 2007 he entered the training market with the aim to provide clear, expert guidance to anyone wanting to learn photography. He soon became known for his ability to explain complex subjects extremely clearly and his range of courses have become the benchmark for effective, entertaining and inspirational training.



INTRODUCTION

We're proud (and excited) to be celebrating 12 years of success in the photography education business, and as our way of giving back to the community, we've completely remastered our highly successful introduction course. Our goal is simple: to help you master your camera in manual mode so that you can confidently create your own amazing images!

'An Introduction To Photography' consists of 10 video tutorials cover the six fundamentals of photography. We've also created this document to support you along the way. In this guide you'll find helpful infographics that explain important photography concepts, along with chapter summaries and short quizzes to test your knowledge.

As you progress, you'll learn how cameras work, aperture, shutter speed, composition and much, much more. Specifically designed to provide an understanding of the fundamentals of photography, this course will help you build a solid foundation as you move forward. By the end of this course, you'll have a clear understanding of the most important theoretical concepts and how to confidently apply them to get your own creative results.

CONTENTS

CHAPTER 1

HOW DOES YOUR CAMERA WORK?

An Introduction To The Six Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

HOW DO CAMERAS WORK?

THE SIX ESSENTIAL STEPS

Over time we've seen great advancements in photographic technology: cameras have shrunk to fit in our pockets, film has largely been replaced by digital and mirrorless is quickly growing in popularity. But despite these changes, cameras (no matter the cost, brand or format) still all work in roughly the same way. This can be broken into six fundamental steps.

These six essentials of photography are light, subject, optics, aperture, time and the recording medium. To record an image we must consider these six things.

To start, we need light to record an image. This light, whether it be from sunlight, candlelight or a light bulb, reflects off of your subject before entering the optics (or lens) and passing through the aperture. After passing through the aperture, the light hits a mirror, which bounces the light up into a prism and out through the viewfinder. Mirrorless cameras, however, have done away with this mirror, which means that that instead of viewing the image through a prism, there is an electronic viewfinder that creates a preview of the image. Regardless of you're camera type, the light then has to be recorded for a certain amount of time (controlled by the shutter) before it is recorded by the medium. By pressing the shutter button, the mirror (if there is one) flips up, light passes through the shutter and is recorded by the medium.

STEP 1 - LIGHT

Light is an essential part of an image, and there are many different types of light. Each of these can be used to create different moods or feelings in an image. As photographers, our job is to control this light to get the best results.

STEP 2 - SUBJECT: COMPOSOTION

The subject (also referred to as composition) is what we photograph and how we arrange elements within the frame. The subject can be absolutely anything, and we can use different compositional rules to create our image.

STEP 3 - CAMERA OPTICS: LENSES

Optics, or lenses, are what focus the available light so that it can be recorded by the medium. Different types of lenses each have their own characteristics that control the focal length, the angle of view and magnification of an image.

STEP 4 - APERTURE: DEPTH OF FIELD

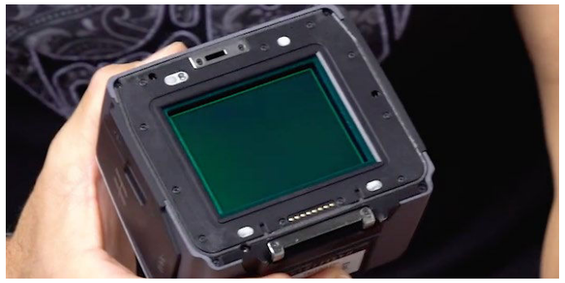
The aperture refers to a hole in the lens that light passes through before reaching the recording medium. Symbolised by the letter 'f', the aperture controls how much light is recorded and the depth of field.

STEP 5 - TIME: SHUTTER SPEED

The shutter speed refers to how long the shutter remains open and is recorded in seconds, tenths or hundredths of a second (e.g. 1", 1/10 or 1/2000). The slower the shutter speed, the more light that is recorded (and vice versa).

STEP 6 - RECORDING MEDIUM: SENSOR

Once light passes through the lens, aperture and shutter, it reaches the recording medium, which records the image. Modern cameras predominantly feature digital sensors, which are either full-frame, crop and medium format.



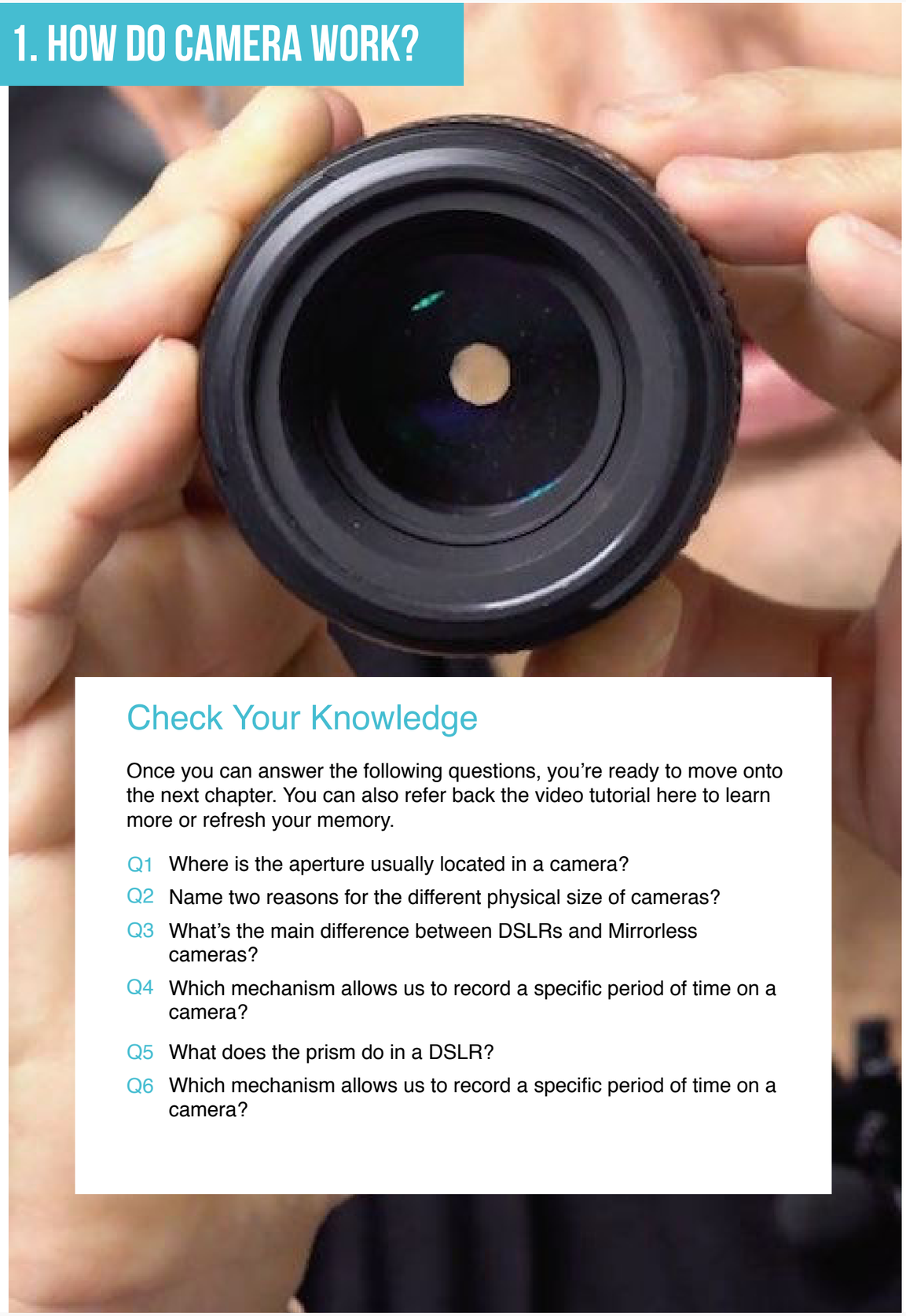
SUMMARY

Cameras, as discussed, all work more or less in the same way regardless of whether you're using an entry-level or professional camera, crop or full-frame sensor, DSLR or mirrorless camera. To record light and capture an image, light has to pass through the lens, aperture and shutter before it reaches the recording medium. Varied in size (or format), the medium is what then records and captures the image. We can determine how the final image looks by the way we compose an image (how we frame and arrange the subject within the scene) and control the light (aperture and shutter speed are the two main functions that allow us to control the amount of light reaching the sensor).

Once you understand these fundamentals, you'll be well on your way to mastering your camera in manual mode.

Light: Essential for us to record an image. **Subject:** What we photograph and how we compose the image. **Optics:** Lenses that focus the light to capture an image. **Aperture:** A hole in the lens that controls how much light gets into the camera. **Time (Shutter):** How long it takes to record an image. **Medium:** What records the image.

1. HOW DO CAMERA WORK?



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 Where is the aperture usually located in a camera?

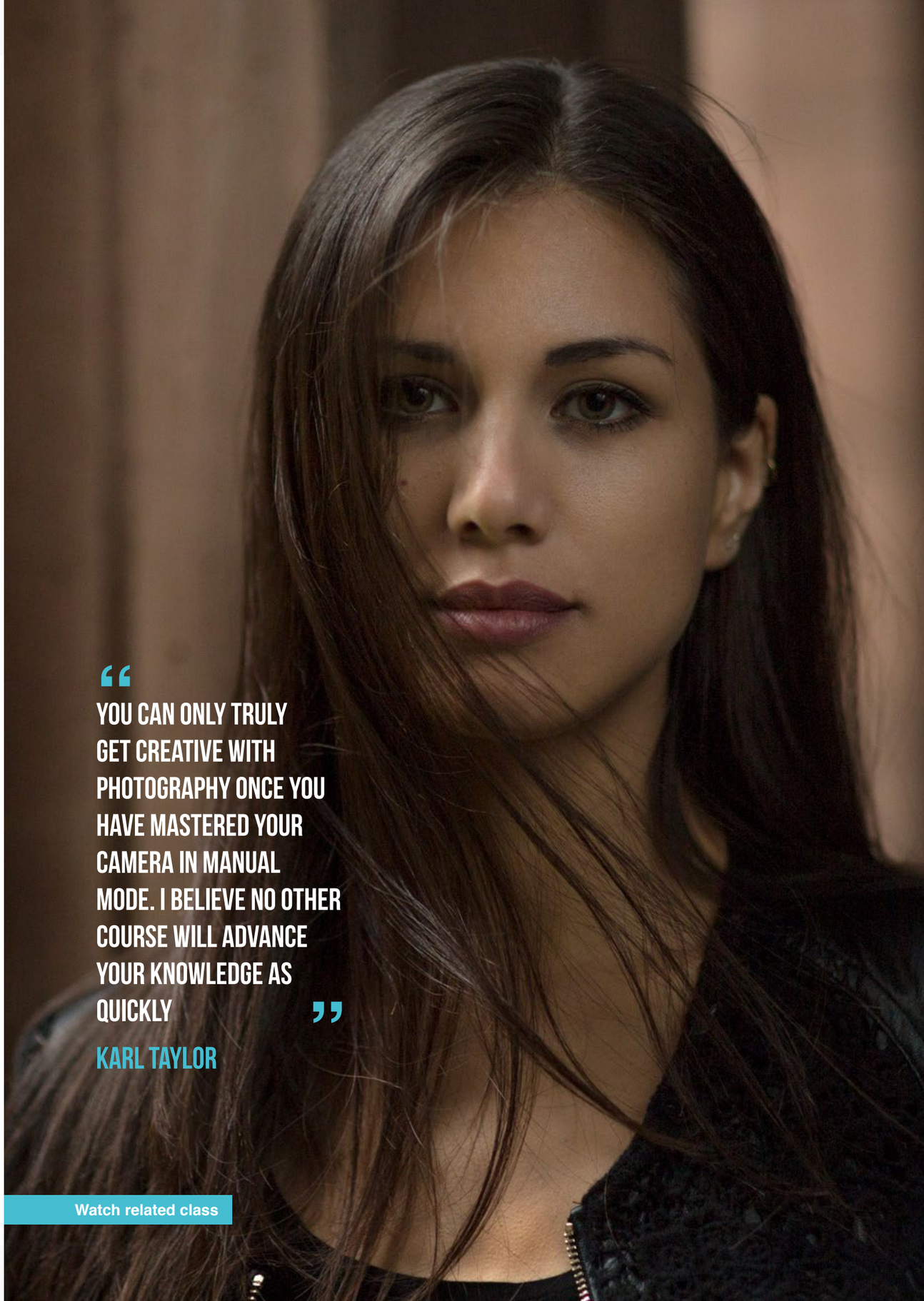
Q2 Name two reasons for the different physical size of cameras?

Q3 What's the main difference between DSLRs and Mirrorless cameras?

Q4 Which mechanism allows us to record a specific period of time on a camera?

Q5 What does the prism do in a DSLR?

Q6 Which mechanism allows us to record a specific period of time on a camera?



"YOU CAN ONLY TRULY GET CREATIVE WITH PHOTOGRAPHY ONCE YOU HAVE MASTERED YOUR CAMERA IN MANUAL MODE. I BELIEVE NO OTHER COURSE WILL ADVANCE YOUR KNOWLEDGE AS QUICKLY"

KARL TAYLOR

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CHAPTER 2

WHAT IS EXPOSURE IN PHOTOGRAPHY?

An Introduction To The Six Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

WHAT IS EXPOSURE IN PHOTOGRAPHY?

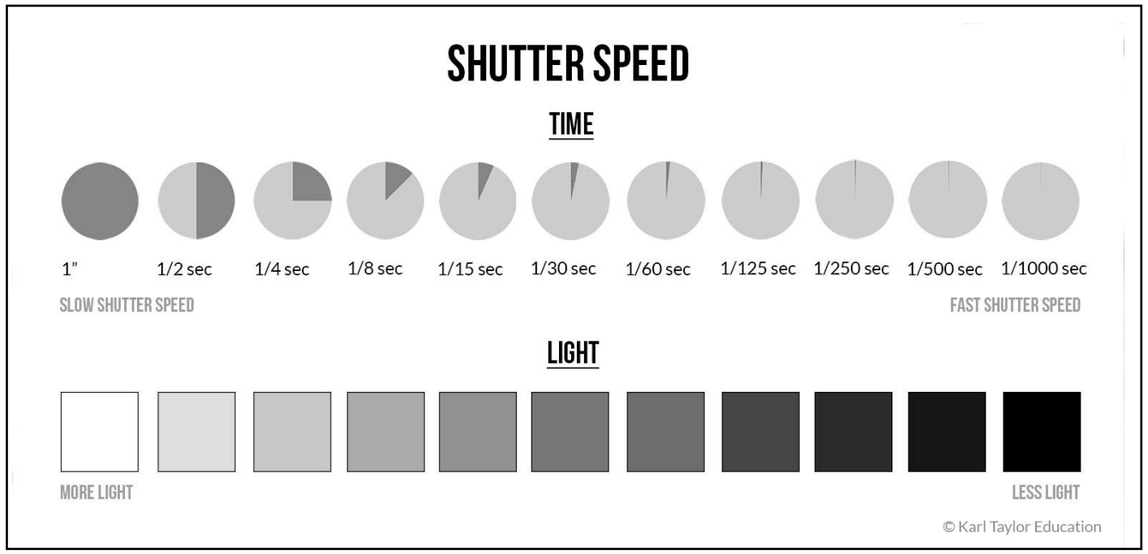
SHUTTER SPEED AND EXPSOURE

Exposure simply refers to the brightness or darkness level of an image. One of the ways we can control how bright or dark an image is is by adjusting the shutter speed.

The shutter speed, which is referred to as 'Time' in the six essentials, refers to how long the shutter remains open when recording an image. The slower the shutter speed, the longer the shutter stays open. This means the medium records light for a longer amount of time, resulting in a brighter image. The faster the shutter speed, the less time the shutter stays open, which means less light will be recorded by the medium.

For example, a slow shutter speed of 1" (one-second) will record more light than a faster shutter speed of 1/500 sec (one-five-hundredth of a second). This means that when working in low light conditions, to get the best exposure it's often necessary to use slower shutter speeds. Whereas photographing on a sunny day may require a faster shutter speed to cut out some of the light in order to get the correct exposure.

To achieve the correct exposure, it's necessary to select an appropriate shutter speed, based on the lighting conditions and the creative effect you want.



APERTURE AND EXPOSURE

Another way to control exposure is by adjusting the aperture, which is the opening in the lens that light passes through before reaching the recording medium.

A larger hole will allow more light to pass through, while a smaller the hole will allow less light to pass through. This means that larger apertures (e.g. f2.8) can be a good choice when shooting in low light conditions as they allow more light to reach the sensor, while smaller apertures can be used in bright conditions where it may be necessary to limit the amount of light reaching the sensor.

A key thing to remember with apertures is that smaller f-stop numbers (e.g. f1.4) refer to larger apertures, or larger openings in the lens. On a given lens, f1.8 may be the largest aperture, allowing the most light to enter the lens, while f32 may be the smallest aperture, allowing the least amount of light to enter the lens.

For example, when photographing at twilight, a larger aperture may be useful as it will allow more light to reach the sensor. But when photographing on a bright sunny day, a smaller aperture may be needed to help cut out some of the light. We can control exposure by using the aperture or shutter speed individually, or together.

CONTROLLING EXPOSURE

Exposure is a key part of photography and knowing how to correctly expose an image is essential. This fundamental skill is something photographers often struggle with, especially if they don't understand what exposure is and how to control it. Measured in stops, exposure refers to the brightness or darkness of an image and is controlled by adjusting the shutter speed and / or aperture. We can increase or decrease the brightness level by adjusting the shutter speed, the aperture or a combination of both. Determining the correct exposure depends on what creative effect you'd like to achieve, for example do you want a shallow or large depth of field, motion blur or no motion blur? Once you've decided this, it is necessary to find a balance between shutter speed and aperture to get the correct exposure. Your camera's built-in light meter will give a good indication of your current exposure and you can use this to adjust your settings as necessary. If an image is too dark, we can either decrease the shutter speed or open the aperture. If an image is too bright, we can either increase the shutter speed or reduce the aperture.

ONE STOP CHANGES

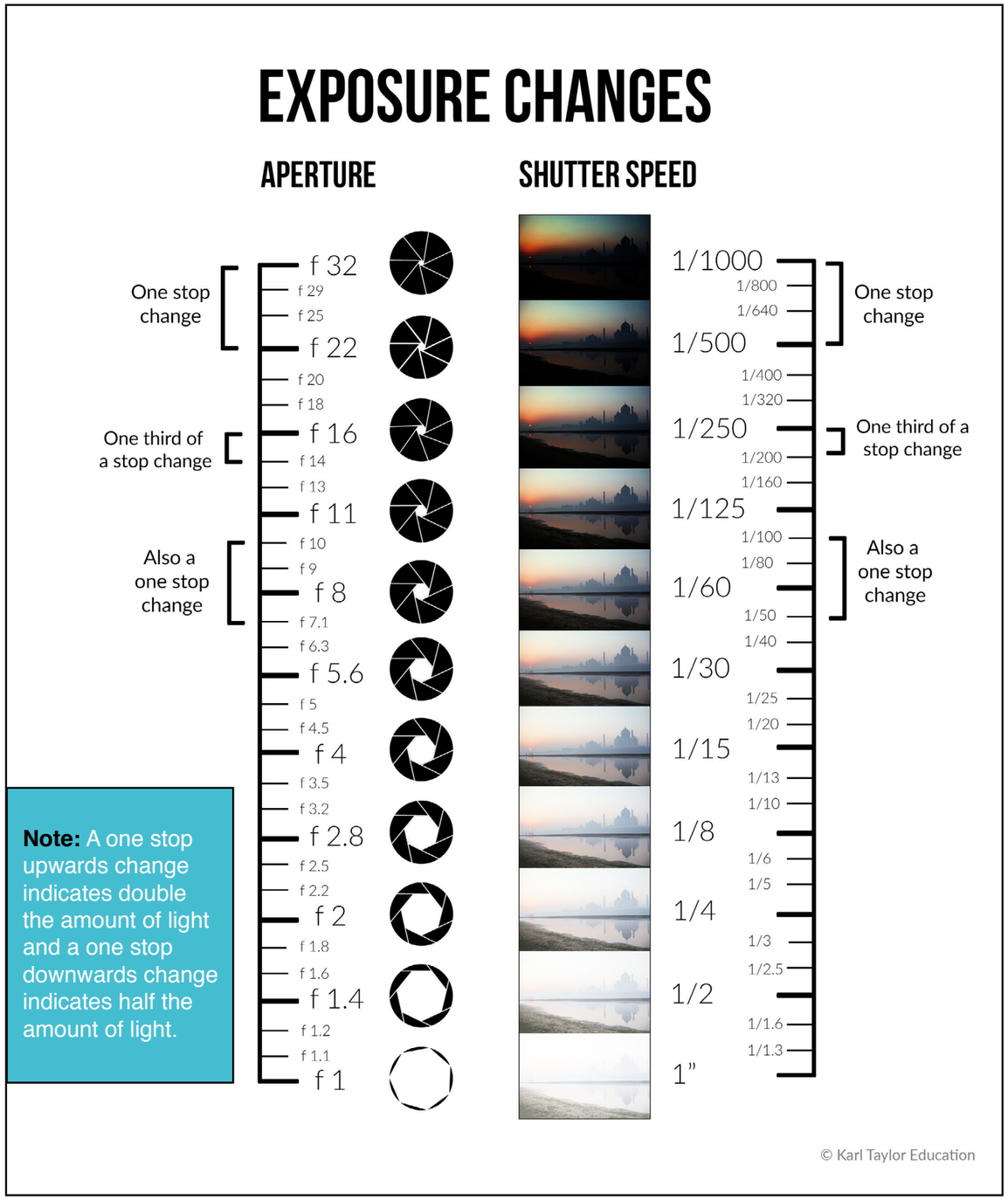
When it comes to controlling exposure, an important concept to understand is that of one-stop changes. Any change in shutter speed or aperture that doubles or halves the amount of light is known as a one-stop change in exposure. For example, a change from f32 to f22 is a one stop increase, the same way changing from 1/60 to 1/125 is a one stop decrease.

Aperture is measured in f-stops and most modern lenses all follow the same f-stop scale: f1, f1.4, f2, f2.8, f4, f5.6, f8, f11, f16, f22, f32. Shutter speed is also measured in stops, with most cameras typically featuring speeds between 1/1000 and 1". A typical shutter speed scale may look like this: 1", 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, 1/1000 etc.

Although one-stop changes are what are commonly referred to throughout this course, it is important to understand that exposure can also be measured in one-third stop changes, as you can see in the image opposite. One-third stop changes are not essential at this level, but do they do offer more precise control of exposure.

UNDERSTAND ONE STOP CHANGES

Below is a visual representation of one-stop and one-third stop exposure changes for both aperture and shutter speeds.



YOUR CAMERA VIEW

So you've just unpacked your camera and are ready to take your first picture. But looking through the viewfinder, you're not sure what everything means! Don't panic — we've created a simple guide to explain it all. To start, let's explain what a viewfinder is. The viewfinder is what allows us to view and compose our image and it tells us what settings will be used to record the image.

These include the exposure, shutter speed, aperture and ISO. The viewfinder also allows us to see where the focus point is, what mode we're shooting in and even the battery level. Below are two examples of a typical viewfinder labelled with what each part means. To start with, the most important things you should be able to identify are the exposure scale (or light meter), shutter speed and aperture. Remember, although displays might vary between camera brands, the fundamentals remain the same.

KEY

Shutter speed
Looking through the viewfinder, you'll see a combination of symbols and numbers. The first set of numbers you see indicates the shutter speed. A shutter speed of 1/100 will show in the viewfinder as 100, 1/50 as 50, 1/2 as 2, and so on. In addition, a one-second exposure will be shown as 1", two-seconds as 2" and so on.

Aperture
The aperture is the second set of numbers seen in the viewfinder. These numbers can vary from as low as 1 (a large aperture) to 32 (a small aperture). Larger apertures let in more light, while smaller apertures let in less light. How low this number can go depends on the lens you're using.

Exposure scale
Also referred to as a light meter, this indicates the exposure of the image. A centred marker indicates a well exposed image. Anything to the left indicates an underexposed image and anything to the right indicates an overexposed image.

Manual Mode
The M showing simply means you are using your camera in Manual mode. This letter changes depending on which mode you're shooting in. For example, A may indicate Auto mode, TV may indicate shutter priority or P may indicate program (these letters and what they stand for will vary between different camera brands).

ISO
The third set of numbers represents the ISO. We recommend that you don't concern yourself with ISO settings yet and keep it on the default setting. ISO will be covered in chapter 9.

Max Bursts
The numbers in the square brackets indicate the max burst (the maximum number of images a camera can record in one burst).

Focus lock
This green dot will appear to indicate that something is in focus. If the green dot is not visible, this indicates that there is no specific point of focus within the image.

Flash status
This indicates whether on-camera flash will be used to capture the image. If this symbol does not show, it means that the image will be taken without flash.

Focus point
The points within the frame that the camera can use for autofocus are shown by focus points in the viewfinder. The number and layout of these points will vary from camera to camera.

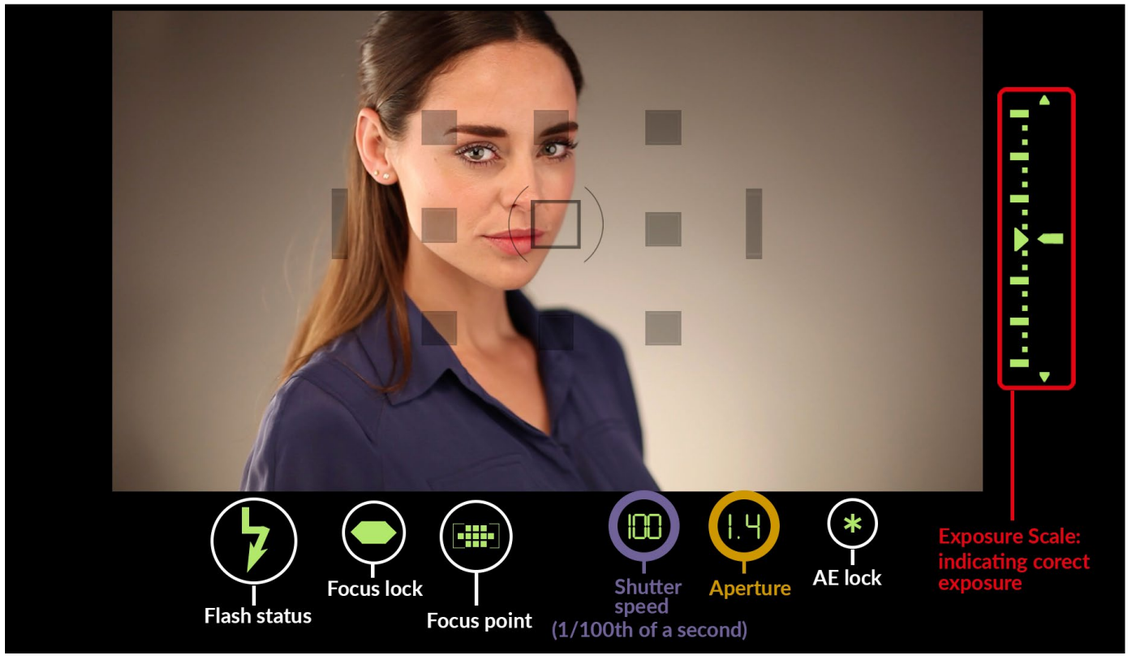
AE lock
This indicates the Auto Exposure Lock function has been enabled. This fixes the exposure

VERSION ONE:

An example of a typical viewfinder display, where the different camera settings and exposure scale are shown at the bottom.

VERSION TWO:

Other viewfinder displays may look slightly different. In this example you can see the exposure scale on the right, with the camera settings shown at the bottom.

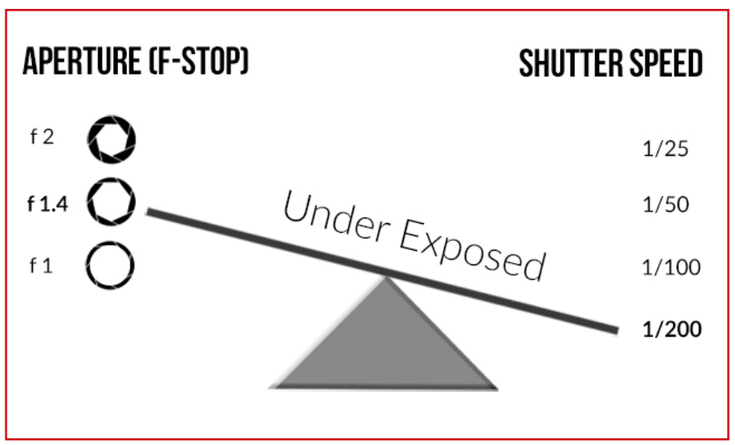


EXPOSURE SEESAWS

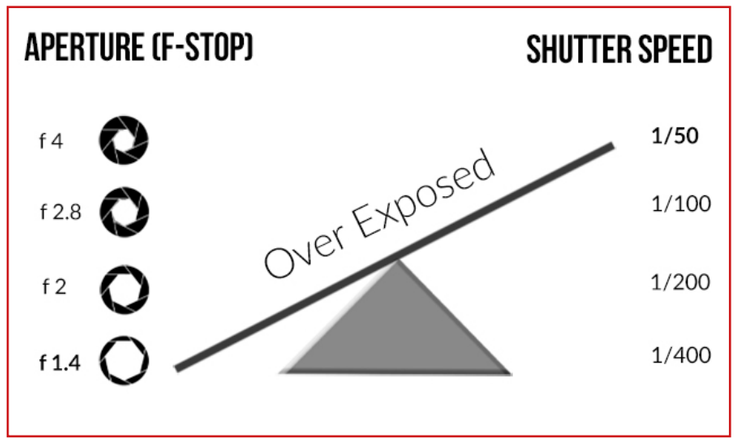
When trying to find and maintain the correct exposure, try and visualise exposure as a seesaw. If there is a change in either shutter speed or aperture, the other will have to be adjusted accordingly to maintain a balance. Any adjustment in one that is not matched by the other will result in an unbalanced or incorrect exposure.

It is important to remember that different shutter speed and aperture combinations can result in the same exposure. This doesn't necessarily mean one combination is more correct, it simply means that we can take advantage of the relationship between shutter speed and aperture to achieve different creative results.

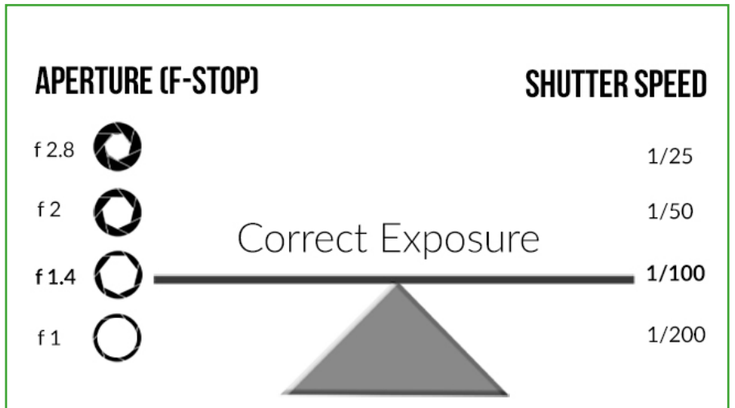
Let's consider an example where we might want to maintain the same exposure, but decrease the depth of field. To achieve a shallower depth of field, the aperture requires to be set at a wide aperture. Let's imagine a two-stop change achieves the desired result. This means that to reach the same exposure, the shutter speed would have to increase by two stops. By increasing the shutter speed, we compensate for the change in the aperture and therefore maintain a balance. If, however, the shutter speed did not change, the final image would have a shallower depth of field, but it would be two-stops overexposed.



Here we can see that the combination of 1/200 at f1.4 results in a one-stop underexposed image (indicated by the camera's exposure scale or light meter). This is because this particular settings combination does not allow enough light to reach the sensor. To correct this, we could either use a slower shutter speed, or open the aperture even further.



In this example we can see that using the same aperture of f1.4 but with a slower shutter speed of 1/50 has resulted in a one-stop overexposed image. This is because the shutter speed decreased by two stops, while the aperture remained the same. The combination of a slower shutter speed and larger aperture allowed too much light to reach the sensor.

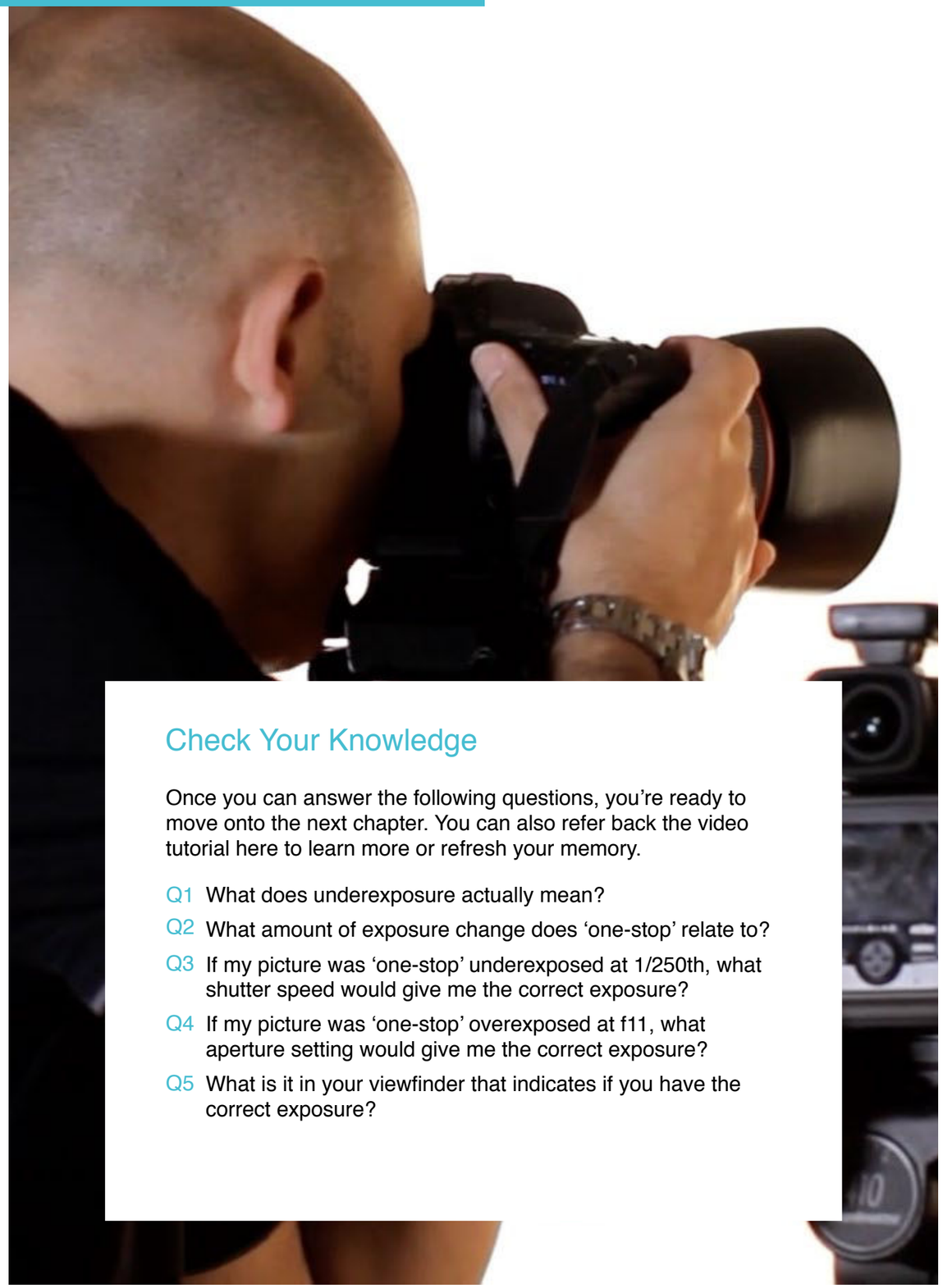


In this example we can see that a combination of 1/100 at f1.4 has resulted in the correct exposure. This could be determined based on either of the two previously incorrect results. Using the principle of a seesaw, we know the same level of brightness could also be achieved using a combination of 1/25 at f2.8, for example.

SUMMARY

By thinking about exposure as a seesaw, we can more easily understand the relationship between shutter speed and aperture and how this can be used to maintain the correct exposure. To do this, any change made to either setting needs to be matched by an equal change in the other. For example, an increased shutter speed will have to be matched with a wider aperture if we are to maintain the same level of exposure in an image. Failure to balance shutter speed and aperture will result in either an overexposed or underexposed image.

2. WHAT IS EXPOSURE?



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 What does underexposure actually mean?

Q2 What amount of exposure change does 'one-stop' relate to?

Q3 If my picture was 'one-stop' underexposed at 1/250th, what shutter speed would give me the correct exposure?

Q4 If my picture was 'one-stop' overexposed at f11, what aperture setting would give me the correct exposure?

Q5 What is it in your viewfinder that indicates if you have the correct exposure?

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CHAPTER 3

SHUTTER SPEED

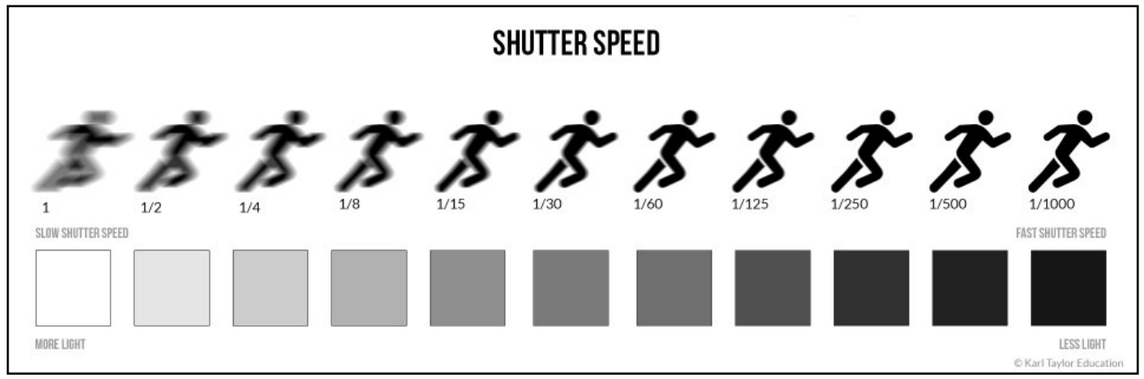
An Introduction To The Six Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

SHUTTER SPEED

SHUTTER SPEED SCALE

The shutter speed controls the amount of time we capture light for as well as how much motion is recorded in an image. Most cameras feature shutters speeds between 1/1000th and 1”. When using faster shutters speeds, the shutter remains open for a shorter length of time. This freezes motion but allows less time for light to be recorded. Slower shutter speeds mean the shutter remains open for longer, blurring motion and allowing more light to be recorded.



CHANGING THE SHUTTER SPEED

You can manually control the shutter speed when shooting in Manual mode or Shutter Priority using the control dial on your camera. You can see what shutter speed is set either on the back screen of the camera, the top LCD panel or through the viewfinder (as

SHOOTING SPEEDS

The shutter speed controls two creative aspects of photography: the exposure (the brightness or darkness level of an image) and the amount of motion blur captured in an image. Faster shutter speeds mean the shutter remains open for a shorter period of time, which means the sensor has less time to record the light once it’s passed through the lens. This results in less light being recorded, which makes faster shutter speeds useful for cutting out additional light in bright, sunny conditions. Faster shutter speeds will also freeze movement and are often used when photographing fast moving subjects like sports or wildlife. When using slow shutter speeds, the shutter remains open for a greater length of time. This not only allows more light to be recorded by the sensor, it also means any moving objects will appear blurred. Slow shutter speeds are commonly used when photographing in low light conditions or when we want to capture motion blur. This can be used for creative effect when photographing a number of different subjects. Common instances where slow shutter speeds can be used creatively are when photographing star trails or running water. When selecting the shutter speed it’s important to keep both of these factors in mind and they will have a noticeable impact on your final image. Try to decide if you want to capture more or less light and if you want to freeze or blur your subject.

FAST SHUTTER SPEED

An example of where a fast shutter speed has been used to freeze movement can be seen in the image on the right. By using a fast shutter speed, the motorbikes appear completely still. How fast your shutter speed needs to be to freeze movement depends on how fast the subject is moving. A faster shutter speed would be needed for motorbikes compared to, say, a child running.

SLOW SHUTTER SPEEDS

In this example a slow shutter speed was used to record an image of a rural landscape featuring the night sky. Using a slow shutter speed meant it was possible for the sensor to record enough light that the stars (and even light from the nearby city) were visible. Photographing the night sky often requires very slow shutter speeds, anywhere between a couple of seconds and up to a few minutes.

SHOOTING TECHNIQUES FOR CREATIVE EFFECT

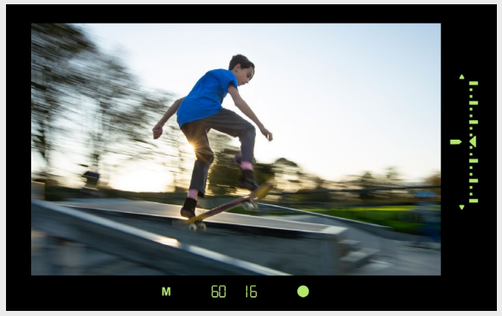
When photographing action shots there are three techniques you can try. The first is capturing motion blur. This can be achieved by using a slow shutter speed while keeping the camera in a static position. The second technique is panning, which can be achieved by using a slow shutter speed while following the subject with the camera. The final technique is to freeze the action and background by using a fast shutter speed.

1. FROZEN ACTION

In this example the subject appears frozen in the frame while the background is blurred. This effect is known as panning. This has been achieved by using a fast shutter speed of 1/500 while following the subject as we capture the shot.

2. PANNING

In this example I applied a technique commonly known as panning, which is when you follow the movement of the subject as you take the image with a fairly slow shutter speed. This results in a relatively frozen subject and motion blurred background.



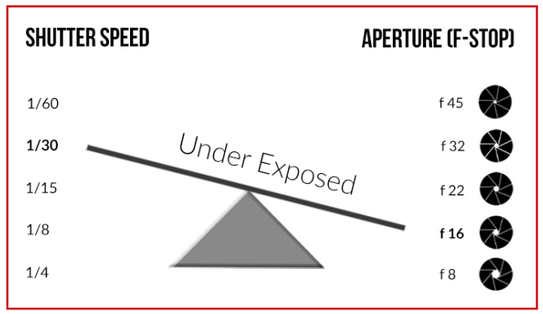
3. MOTION BLUR

In these examples below motion blur has been created by using various slow shutter speeds. In the example of the girl on the bike, the shutter speed of 1/30 has resulted in the subject being blurred as they pass through the frame, but because the camera has remained in a fixed position, everything else appears sharp. Alternatively, in the case if the seascape shot, the shutter speed was slower at 4 seconds, which allowed the motion of the waves to be captured, whilst still elements of the image remain sharp. Remember motion blur can only be successful when there is no camera shake, therefore a tripod is essential.

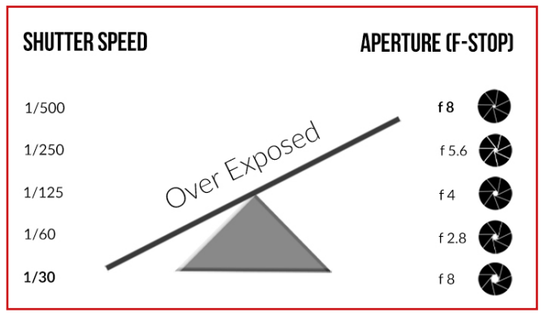
BALANCING EXPOSURE AND SHUTTER SPEED

Cameras, no matter how much they cost or what brand they are, all work in roughly the the simple mechanics of how cameras work will help you realize just how similar they are and how you can get the best possible results out of yours.recording medium. The six essential steps are made up of the light, possible results out of yours.time and the recording medium. The six essential steps are made up of the light, the subject, the camera optics, the aperture, the time and the recording medium. , the time and the recording medium. Cameras, no matter how much they cost or what brand they are, all

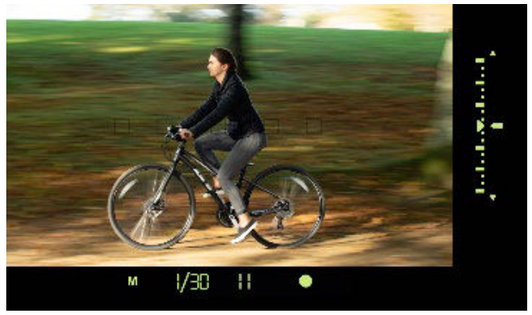
UNDER EXPOSED

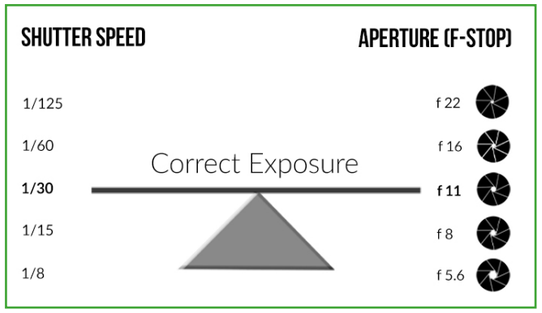


OVER EXPOSED



CORRECT EXPOSURE





SUMMARY

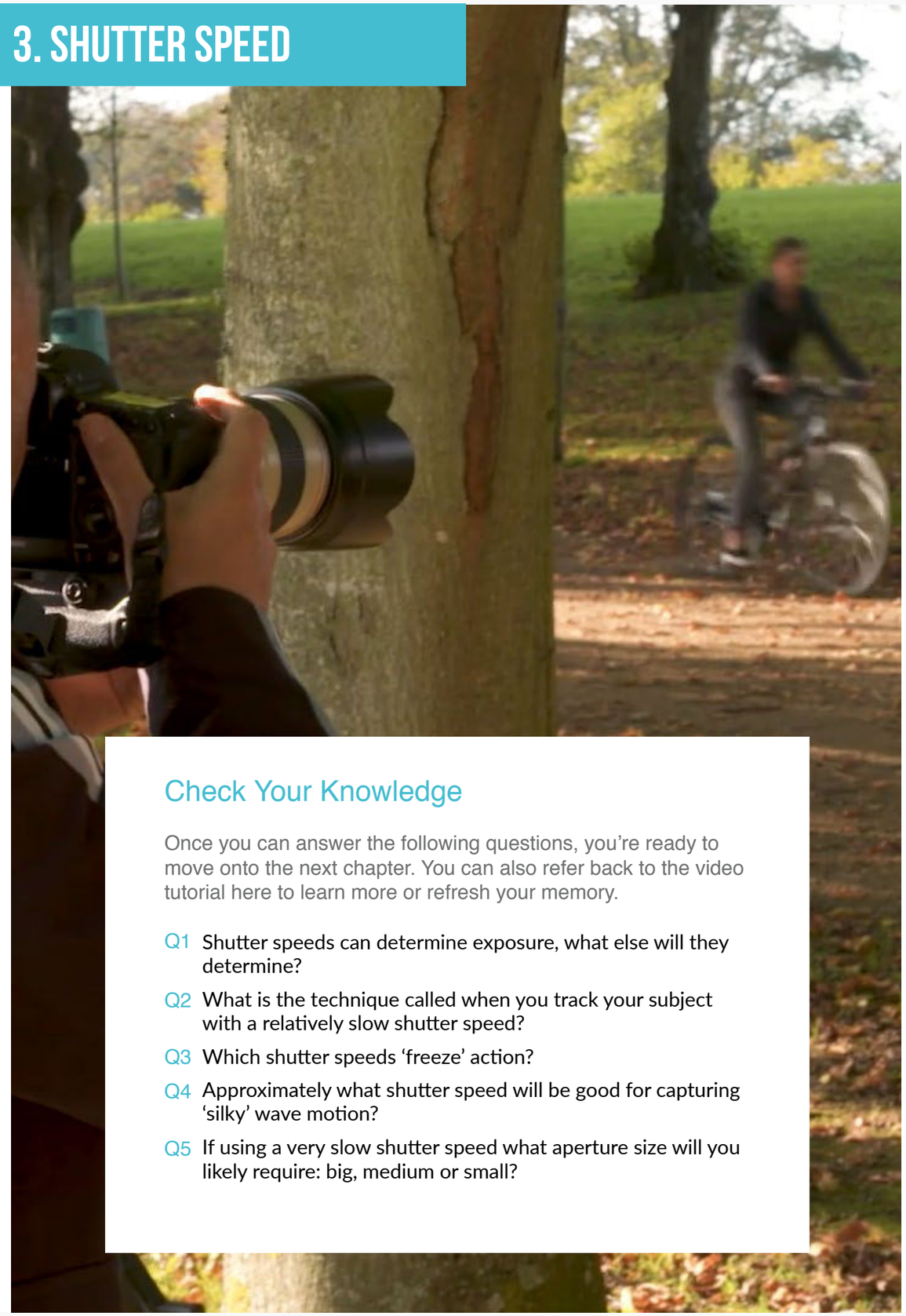
Shutter speed is the length of time that the shutter remains open to allow the medium to record light and is one of the key methods we can use to control exposure. Measured in fractions of a second, most cameras will have shutter speeds ranging between 30” and 1/8000.

This can be adjusted simply using the control dial on the camera and can be viewed on the back of the camera, the top LCD panel or through the viewfinder.

Slower shutter speeds will record more light while fast shutter speeds will record less light. In addition to controlling the brightness or darkness level of the image, the shutter speed also determines how much motion is recorded in an image. Slow shutter speeds will create the effect of movement (depending on how much and how quickly the subject is moving) while fast shutter speeds will freeze movement and result in motionless looking images. Slow shutter speeds are therefore often used when photographing in low light or at night or when wanting to creative the effect of movement in an image, while fast shutter speeds are often used when photographing in sunny conditions or when wanting to freeze fast moving subjects.

Selecting which shutter speed to use depends on what we’re photographing and the creative effect we want. There are a number of creative techniques that can be achieved by using different shutter speeds, including panning.

3. SHUTTER SPEED



Check Your Knowledge

Once you can answer the following questions, you’re ready to move onto the next chapter. You can also refer back to the video tutorial here to learn more or refresh your memory.

Q1 Shutter speeds can determine exposure, what else will they determine?

Q2 What is the technique called when you track your subject with a relatively slow shutter speed?

Q3 Which shutter speeds ‘freeze’ action?

Q4 Approximately what shutter speed will be good for capturing ‘silky’ wave motion?

Q5 If using a very slow shutter speed what aperture size will you likely require: big, medium or small?

“
YOU CAN ONLY TRULY GET CREATIVE WITH PHOTOGRAPHY ONCE YOU HAVE MASTERED YOUR CAMERA IN MANUAL MODE. I BELIEVE NO OTHER COURSE WILL ADVANCE YOUR KNOWLEDGE AS

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CHAPTER 4

CAMERA FOCUS

An Introduction To The Six Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

CAMERA FOCUS

ADJUSTING THE FOCUS

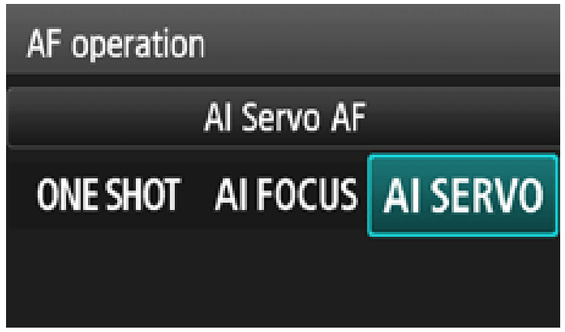
When taking a photo it is essential that at least a part of the image is in focus. To create a photo, light is directed through the lens before it reaches the recording medium. The lens, regardless of whether it's built into your camera or interchangeable, is made up of elements, which are what focus the light. Adjusting this focus can be done manually, or automatically. If using manual focus, it is simply a case of rotating the focus ring on the lens until the area you want in focus becomes sharp. When using autofocus, there are two factors to understand: focus points and focus modes. Focus points are the squares that can be seen in the viewfinder when framing the image. These determine where the point of focus in an image will be. Using autofocus, the camera can automatically select the focus point(s) or you can select the focus point manually. The other factor to consider is the focus mode. This is what determines how the autofocus works while the shutter is half pressed. Focus modes vary between cameras, but most will have at least two: either a single shot focus mode or a continuous focus mode. The single shot focus mode keeps the focus point once the shutter is half pressed, even if you reframe the image. Continuous focusing continuously recalcultates and readjusts the focus until the image is taken.

Camera focus modes

	Advantages	Disadvantages
Manual Focus	• More accurate in low light conditions • Useful in situations where there is low contrast • Good for scenes that are busy and confusing when your camera doesn't know what to focus on	• Can be slower to manually focus • Can be difficult to get focus correct • Time consuming when having to recompose and refocus often
Autofocus	• Quick • Different autofocus options for different situations • Good for scenes that are often changing (like sport or wildlife photography)	• Can be difficult to use in low light conditions • Can be difficult to use in scenes with low contrast • Not always accurate in busy or confusing scenes

AUTO FOCUS

Autofocus is a great option for those still getting to grips with their camera as it is a quick and easy method of focusing. Using autofocus, the camera selects the focus point and automatically focuses the lens. Different cameras have different focus systems, and different focus points. Depending on the focus mode you choose, you or the camera can choose the best point of focus. Some modern day cameras also feature eye detection, which can be very useful as this is often the best place to focus.

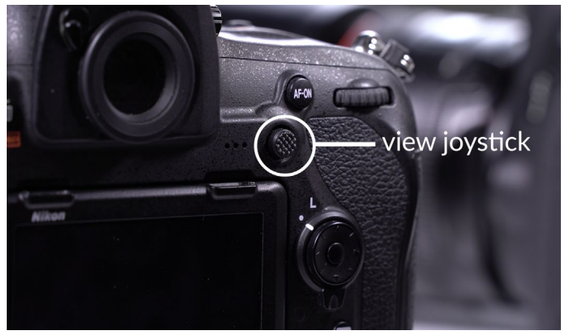


MANUAL FOCUS

Not as commonly used as autofocus, manual focus is still very relevant as it gives the user a far greater level of control in deciding where the focal point in an image should be. It can be particularly useful in situations where the camera has difficulty focusing (this can often occur is in low light conditions or when the background is very busy) or when taking a series of images where you don't want the focus point to change. This means it can still be worth knowing how to use manual focus.

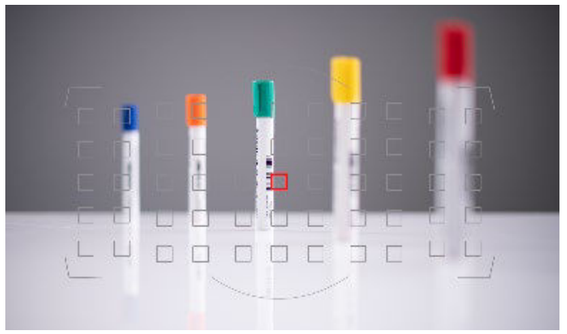
CAMERA CONTROLS

Initial focus can be achieved by pressing the shutter button halfway down. This focuses the lens according to which focus selection point is selected. To adjust these points, use either the control wheel or buttons on the camera, or some cameras even have a joystick on the back for this. Some cameras also have back button focusing - this allows you to control the focus without pressing the shutter button (this feature may take some time to get used to, but does have its advantages).



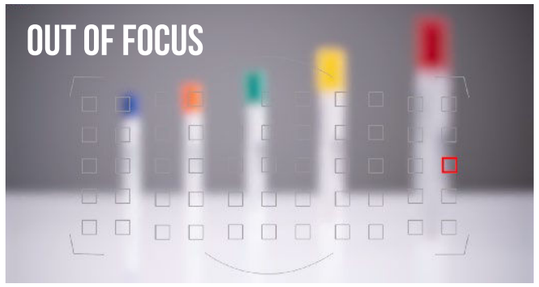
SELECTION POINTS

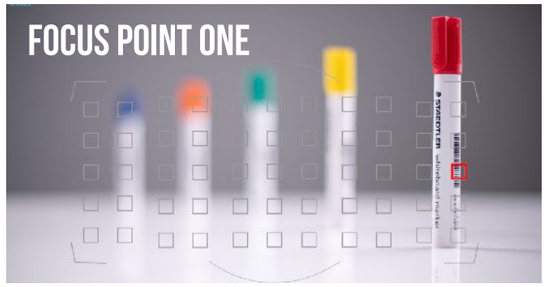
Looking through the viewfinder, you will see a number of small grey squares in front of the image. These are focus selection points, and the focus point of the image is determined using these. Different cameras have different numbers of selection points, as well as different layouts of these points. These points make up what is referred to as the autofocus area. Controlling the selected focus point can be done automatically by the camera or manually by the photographer.

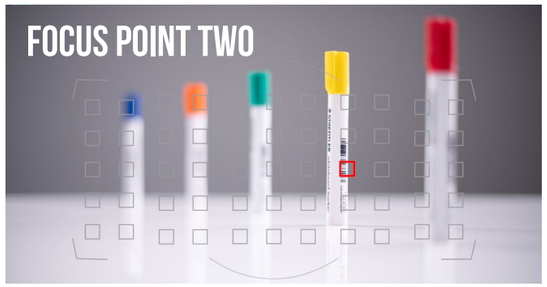


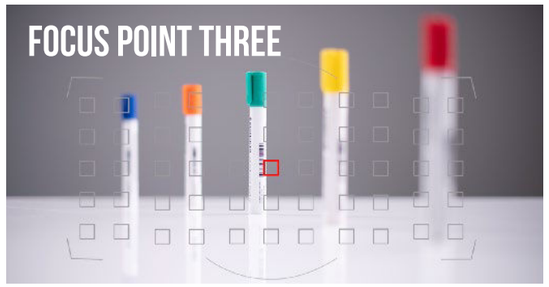
SELECTING YOUR FOCAL POINTS

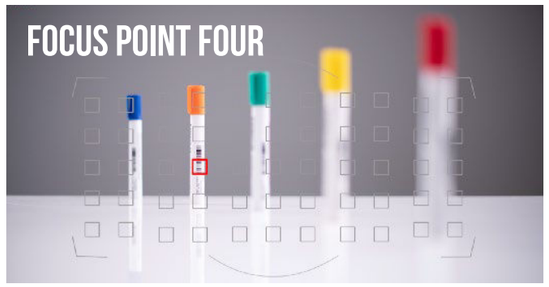
Whether you're photographing landscapes or portraits, the key is the have the focus selection point over the area that you want to be sharp. In the examples below you can see how the focus points have changed, shifting the focus to different points within the image. Where we focus in an image can have a big impact on the final result, so it's important to choose the best focus point.

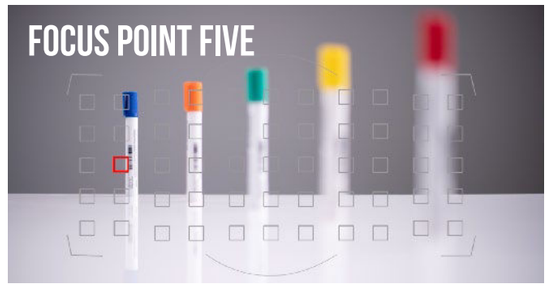








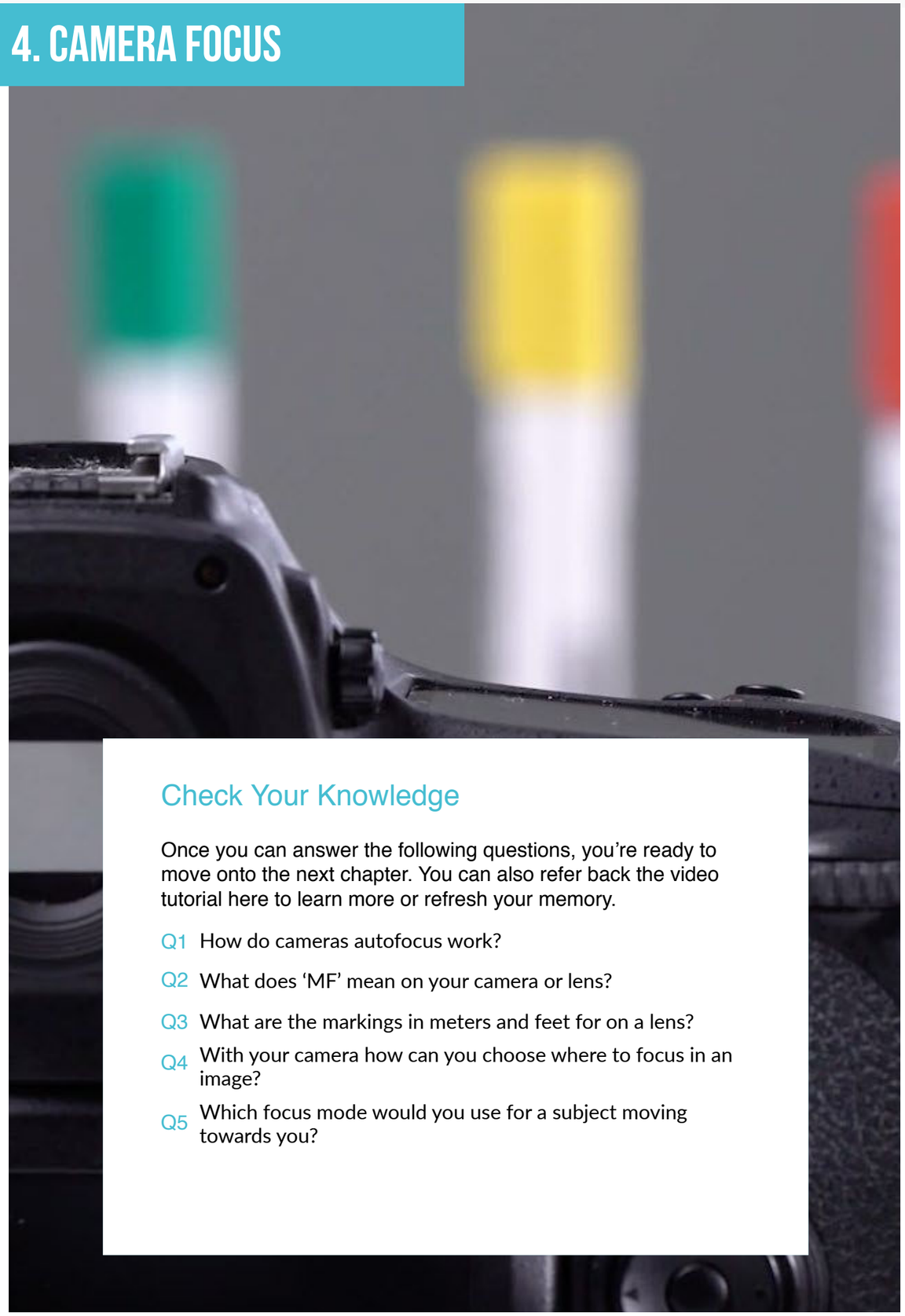




SUMMARY

Focus is an important concept to understand in photography as it can make or break an image. With most camera lenses nowadays we have the option to choose between manual focus and autofocus, both of which have their advantages and disadvantages. When using autofocus, the two most important concepts to understand are focus points and focus modes. Focus points can be selected automatically or manually, and where these focus points are in an image can have a great bearing on how the final image looks.

4. CAMERA FOCUS



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 How do cameras autofocus work?

Q2 What does 'MF' mean on your camera or lens?

Q3 What are the markings in meters and feet for on a lens?

Q4 With your camera how can you choose where to focus in an image?

Q5 Which focus mode would you use for a subject moving towards you?

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CHAPTER 5

APERTURE AND DEPTH OF FIELD

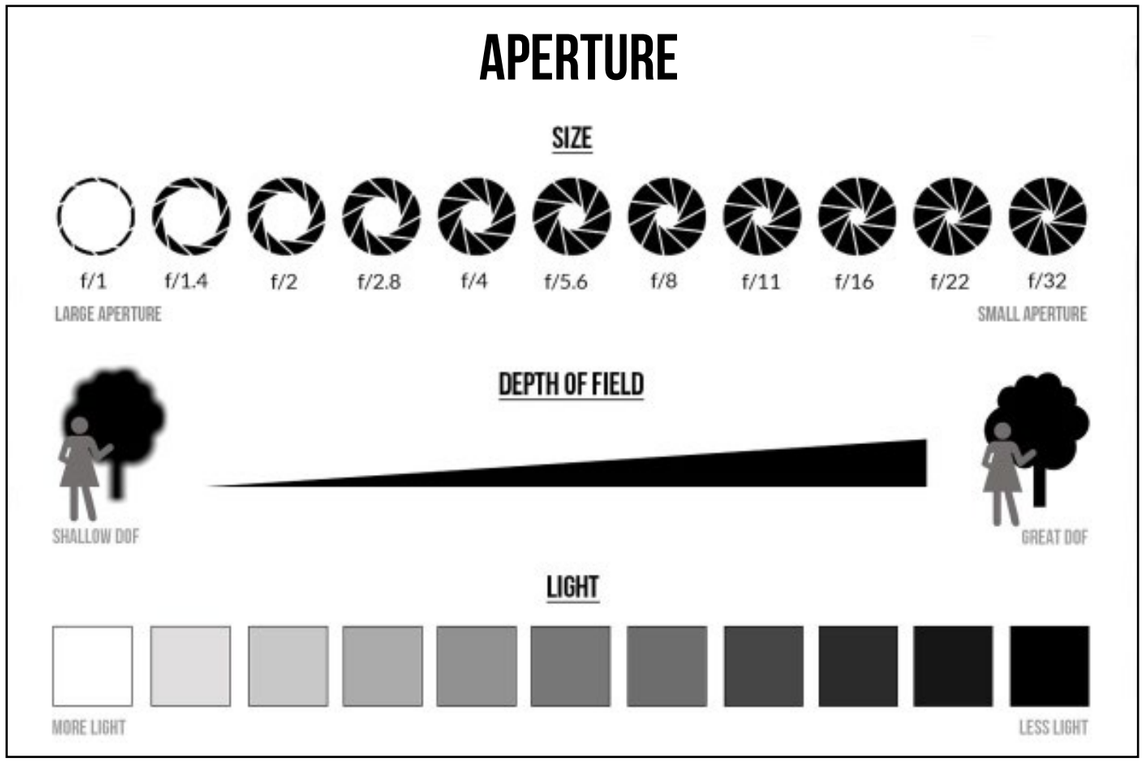
An Introduction To The Six Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

APERTURE AND DEPTH OF FIELD

HOW TO CHANGE THE DEPTH OF FIELD

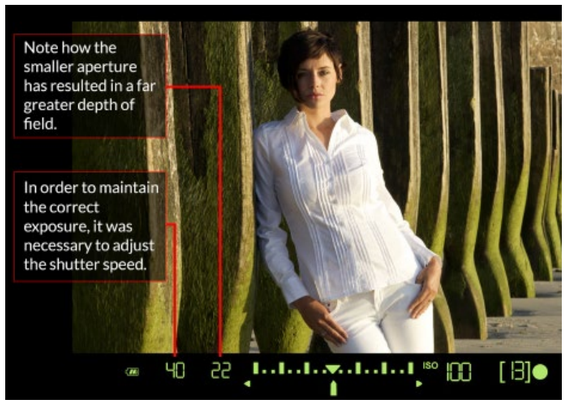
The aperture refers to the opening in the lens through which light passes before reaching the medium. This controls not only the amount of light recorded in an image, but also the depth of field (this is the sharpness range either side of a focus point). Adjusting the aperture is the easiest way to control the depth of field. Larger apertures, like f1.2, result in less depth of field, while smaller apertures, like f16, result in greater depth of field. Using the control wheel on the camera to change the aperture, we can change the depth of field. There are other factors that also influence depth of field though. These include the distance from the subject, magnification and sensor size.



CREATIVE EFFECTS OF APERTURE

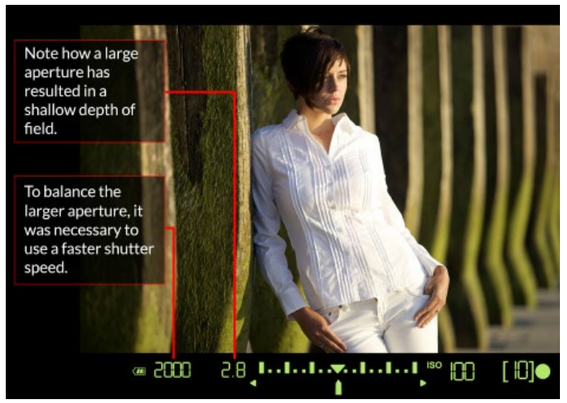
By controlling the aperture, we can control the exposure of an image as well as the depth of field. Adjusting the depth of field is one of the easiest ways to get creative in photography, but to do so it's important to understand how aperture works and how this relates to depth of field. Larger apertures, such as f1.2, allow more light to pass through the lens and reach the sensor. They also result in a much shallower depth of field. This means only a small part of the image will be sharp, with the remainder of the image appearing blurry (this is often referred to as 'bokeh'). Larger apertures are typically used in instances where we want to focus on just a small part of the image, for example a bee on a flower or the eyes of a person. Smaller apertures, such as f22, allow less light to pass through the lens, which means they often result in much darker images. They also allow for a much greater depth of field, which makes them ideal for shooting landscapes or images where we want to see detail in the background. Another creative effect that can be achieved by adjusting the aperture is what's commonly referred to as a starburst effect. This occurs when photographing focused light sources (such as a street lamp or even the sun) when using a small aperture.

SMALL APERTURE: F22



In this example a small aperture of f22 has been used to photograph the subject. This has resulted in a large depth of field, where both the subject and poles in the background are sharp. Large apertures like this are not often used when photographing people because the large depth of field can often make the final image appear quite busy.

LARGE APERTURE: F2.8



Although it is not incorrect to use small apertures when photographing people, this example shows how a shallower depth of field, achieved using an aperture of f2.8, has resulted in a much more pleasing result. Using large apertures is common when photographing people as it helps to create separation between the model and the background.

BALANCING EXPOSURE AND DEPTH OF FIELD

In this chapter you will have seen how aperture can be used to control the brightness or darkness of an image and how it can be balanced with shutter speed to achieve the correct exposure. Using a larger aperture will increase light recorded in an image, while using a smaller aperture will result in less light being recorded. To achieve the correct exposure, it is necessary to adjust more than just the aperture though.

Once we have determined the desired depth of field, it may also be necessary to change the shutter speed to achieve the correct exposure. For example, at f22 an image may be too dark, which means it may be necessary to use a slower shutter speed to balance the exposure, the same way using a large aperture may result in an overexposed image, which means a faster shutter speed may be needed.

SHOT ONE

Large Aperture with fast shutter speed

In this example, using a large aperture of f1.4 with a very fast shutter speed of 1/640 has resulted in the correct exposure. The wider aperture has been used to achieve a shallow depth of field (we can see only the yellow pen is in focus). In addition, a faster shutter speed, which does not allow too much light through the lense, has then been used to balance the exposure.

SHOT TWO

Medium aperture with fast shutter speed

In this example, using the same fast shutter speed of 1/640 but this time with a smaller aperture of f8 has resulted in an underexposed image. This is because both fast shutter speeds and small apertures limit the amount of light recorded by the medium. This has resulted in an imbalance, which could be corrected by using a slower shutter speed or a larger aperture.

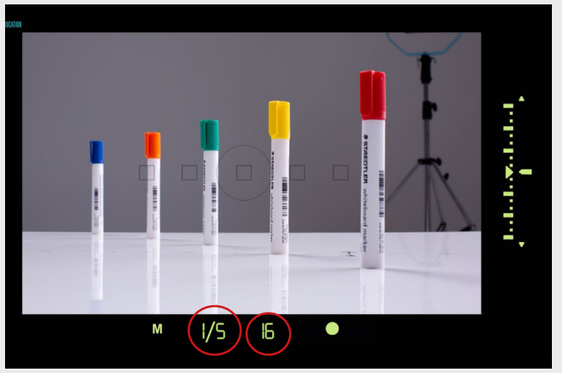
SHOT THREE

Medium aperture and slow shutter speed

In this example, using the same aperture of f8, we have achieved the correct exposure by using a much slower shutter speed. By reducing the shutter speed from 1/640 to 1/20, we have increased the amount of light by five-stops to achieve the correct exposure. This setting combination has resulted as the same exposure as shown in the first example, but with a far greater depth of field.

SHOT FOUR

Small aperture and slow shutter speed

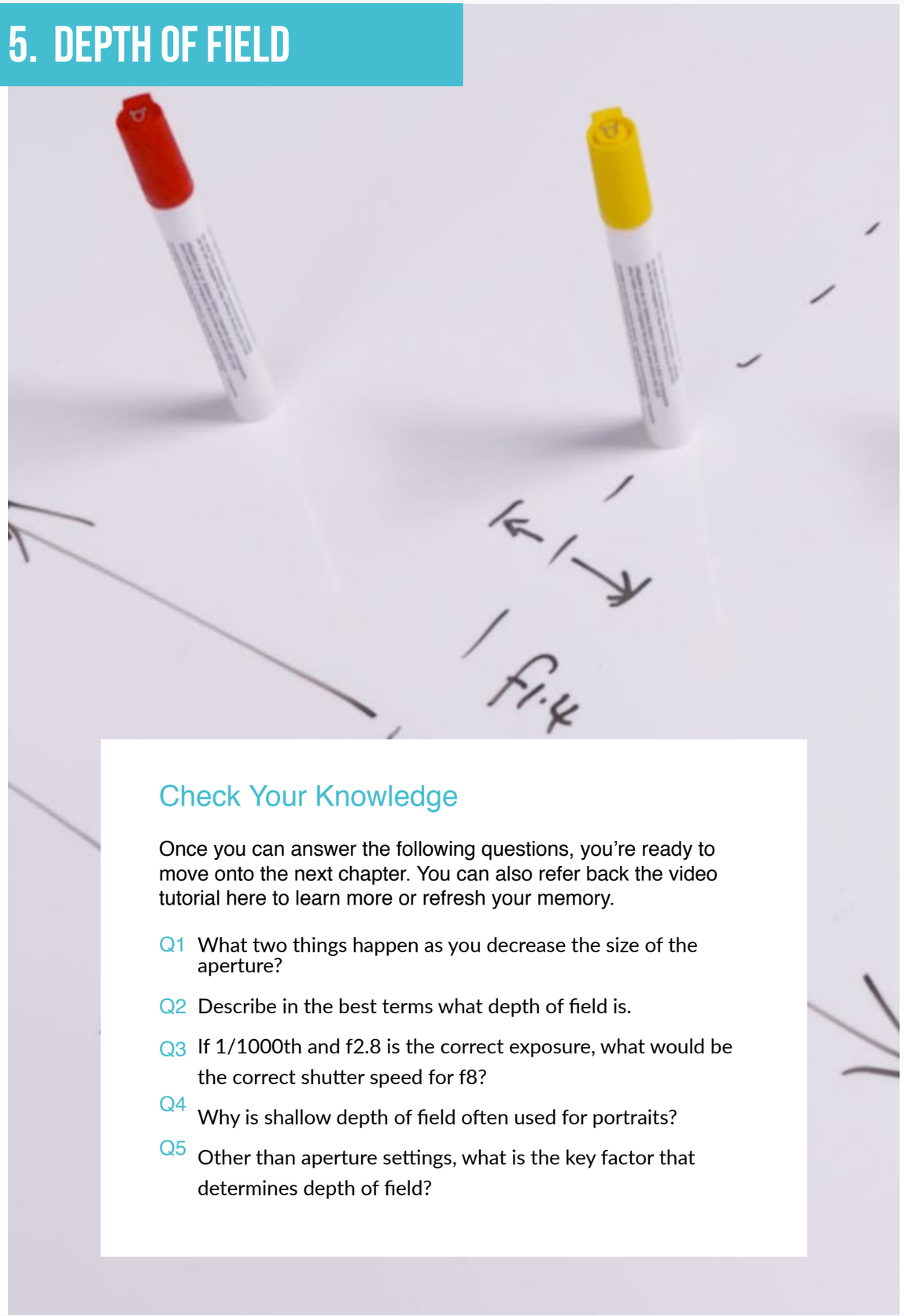


In this example we can see how a different setting combination has resulted in the same exposure, but with a larger depth of field. This has been achieved by using a larger aperture of f16 together with a slow shutter speed of 1/5. By decreasing the size of the aperture, it becomes necessary to reduce the shutter speed to compensate for the loss of light caused by the aperture change.

SUMMARY

The aperture is one of the easiest ways to take creative images, and with it, we can control both the exposure and depth of field of an image. Small apertures like f2 result in more light and shallow depth of field, while larger apertures like f16 result in less light and larger depth of field. Large apertures are often used to photograph people as they help separate the subject from the background, and small apertures are popular for landscapes because of the larger depth of field.To controlling depth of field, aperture is not the only option. Magnification, distance from the subject and the sensor size also have an impact. The aperture also control the brightness or darkness of an image, and we can use this together with the shutter speed to achieve the correct exposure.

5. DEPTH OF FIELD



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 What two things happen as you decrease the size of the aperture?

Q2 Describe in the best terms what depth of field is.

Q3 If 1/1000th and f2.8 is the correct exposure, what would be the correct shutter speed for f8?

Q4 Why is shallow depth of field often used for portraits?

Q5 Other than aperture settings, what is the key factor that determines depth of field?

CHAPTER 6

GET CREATIVE IN MANUAL MODE

An Introduction To The 6 Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

MANUAL MODE

Learning to shoot in manual mode may initially seem like a bit of a balancing act, but it is important to master if you want to get creative with your photography. In this chapter Karl explains his camera settings whilst shooting a beautiful seascape. He battles with the setting sun and changing light, maintaining depth of field and capturing the desired amount of motion in the waves. Only once you've mastered each of these concepts will you be able to achieve truly creative results.

EARLIER SHOT: MORE AVAILIBLE LIGHT

LATER SHOT: LESS AVAILIBLE LIGHT

During this chapter I go out and photograph a seascape sunset. Throughout the shoot I experience changing levels of light as the sun sets lower in the sky. I demonstrate how mastering manual mode can enable you to adapt to light changes in your environment whilst still achieving the creative results desired.

Early on in the shoot the sun was still fairly high in the sky, as seen on the left. The aperture of f16 allowed a large depth of field. The slower shutter of 4 seconds allowed Karl to capture enough light as well as some motion. With these settings, he was able to achieve the correct exposure.

However later in the shoot, as shown on the left, the sun had dropped in the sky. Wanting to keep the same exposure time to capture the desired amount of motion in the water, adjusting the shutter speed was not an option for Karl to correct the exposure. So, instead he opened the aperture by one third of a stop to f14 to increase the exposure.

WHAT CAN BE ACHIEVED IN MANUAL MODE

Shooting in manual mode is just like learning to drive a car. Although it may seem daunting at first, once you've finally mastered in you'll wonder why you ever really worried in the first place! Shooting in manual mode requires you to find a balance between shutter speed and aperture to achieve the correct exposure. What you can do with just these two settings is limitless. Light painting at night? No problem. Silky smooth water for a crashing waterfall? Easy. Moody portraits with shallow depth of field? Simple. In this chapter Karl touches on just a few of the things you can achieve when shooting in Manual mode. The truth is that these examples are just the start. Your imagination is the only real limit. To achieve the creative images you've always imagined, the key things to remember are shutter speed and aperture, the effects of each and how they can be balanced to achieve the correct exposure, and the fastest way to learn this is to get out and practice. Below are just a few examples of creative ideas you could try.

LIGHT PAINTING WITH A LONG EXPOSURE

Light painting is a creative technique that looks far more complex than it actually is. This is where light is 'painted' into the photograph using an additional light source while shooting with a long exposure. The key to this is a slow shutter speed as this is what will allow you to record the extra light being 'painted' into the scene. This can require exposures of up to several minutes - the image on the left was taken over 18 minute! Light painting is a great way to get creative and try something new; and doesn't require much more than your camera, a tripod and a powerful torch (for longer exposures, a shutter release cable can also be useful).

UNDER EXPOSED PORTRAITURE FOR CREATIVE EFFECT

One of the greatest benefits of shooting in manual mode it that it enables you to create results that you wouldn't otherwise be able to achieve using any of the automatic or semi-automatic modes on your camera. This portrait is a great example of this. The dark, moody lighting is exactly what was intended, but using auto, your camera would have perceived this as 'underexposed' and either lowered the shutter speed or opened the aperture to lighten the image. By making the switch to manual mode, it gives you the freedom to take those next creative steps with your camera.

SHALLOW DEPTH OF FIELD FOR A BLURRED BACKGROUND

Shallow depth of field is a common choice when it comes to portrait photography and it is one of the easiest ways to add an extra level of creativity to your images. A shallow depth of field helps to draw the focus to your subject and make them stand out, which can be particularly useful when photographing against a busy backdrop. To achieve shallow depth of field it is necessary to use large apertures such as f1.2 or even f2.8 (remember magnification, distance from the subject and sensor size also have an impact on depth of field). This particular image was shot at fXXX, which is what has helped create a beautiful soft background.

WIDE DEPTH OF FEILD

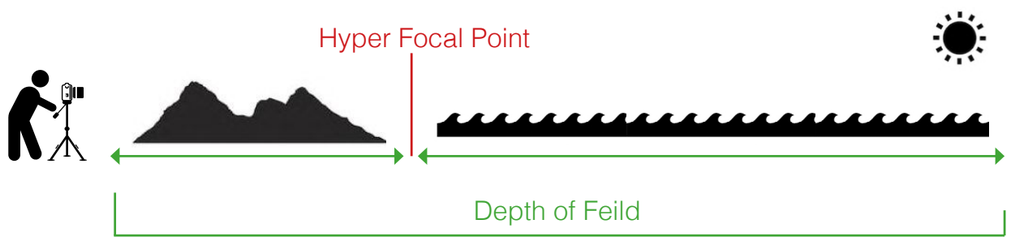
Although wide apertures are a popular choice when photographing people, they are not the only option. Sometimes using a small aperture for greater depth of field can have an equally interesting result, as you can see in this image. This is particularly relevant when photographing scenes where we want the subject as well as the background to be sharp. By using an aperture of fXXX we were able to keep the city buildings behind sharp too. This, along with the low shooting angle, has helped create a dramatic and imposing image.

LANDSCAPE PHOTOGRAPHY:

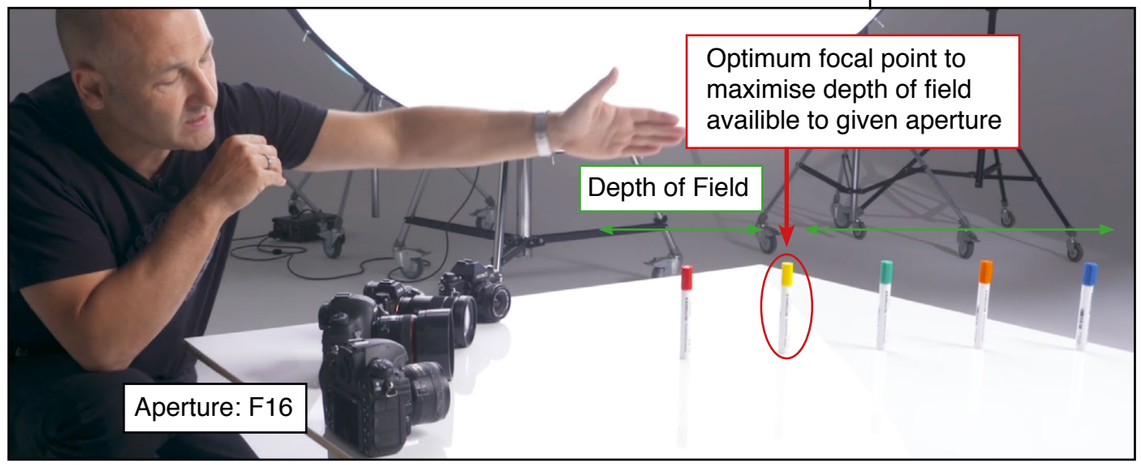
HOW TO MAXIMIZE DEPTH OF FIELD

HYPER FOCAL DISTANCE

HOW TO FIND THE OPTIMUM FOCUS POINT IN LANDSCAPE PHOTOGRAHY



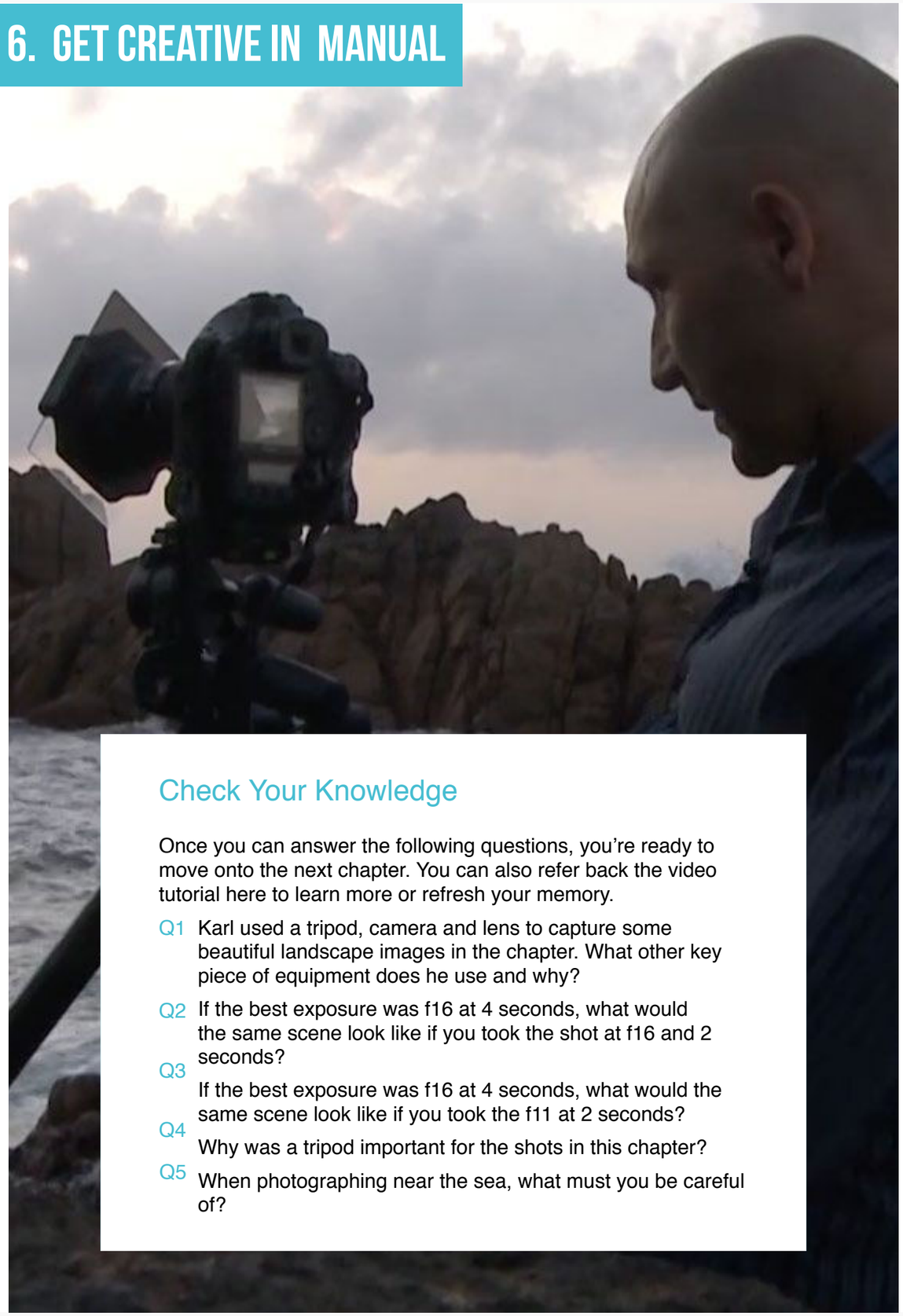
MAXIMIZE DEPTH OF FIELD



SUMMARY

The advantages of using your camera in manual mode are endless. It allows you to develop a far greater understanding of how your camera works and how to balance exposure, and it also allows you the creative freedom to take photos that otherwise wouldn't have been possible using your camera in an automatic or semi-automatic mode. Although it can take a little time to master, i'll be worth it. Shooting in manual mode you will be able to make the most of your creativity & advance your photography.

6. GET CREATIVE IN MANUAL



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 Karl used a tripod, camera and lens to capture some beautiful landscape images in the chapter. What other key piece of equipment does he use and why?

Q2 If the best exposure was f16 at 4 seconds, what would the same scene look like if you took the shot at f16 and 2 seconds?

Q3 If the best exposure was f16 at 4 seconds, what would the same scene look like if you took the f11 at 2 seconds?

Q4 Why was a tripod important for the shots in this chapter?

Q5 When photographing near the sea, what must you be careful of?

CHAPTER 7

OPTICS AND LENSES

An Introduction To The 6 Essentials of Photography

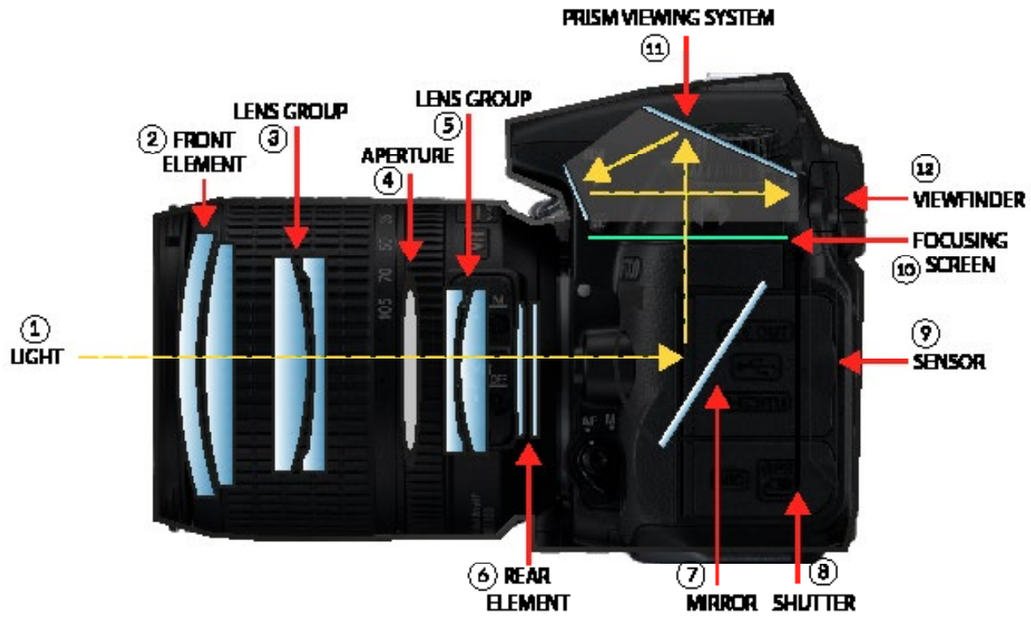
Light • Subject • Optics • Aperture • Time • Recording Medium

OPTICS AND LENSES

UNDERSTANDING LENSES

Lenses are an important part of the photographic process as their unique characteristics are, in part, what determine the look and feel of the final image. As light reflected off of the subject enters the lens, the light passes through a number of elements (as well as the aperture) before passing through the shutter and reaching the sensor. These lens elements are what serve to focus the light so that it can be recorded by the medium. Lenses control the focal length of an image, the angle of view, magnification and help describe the image based on their particular characteristics. Available in a variety of different focal lengths, ranging from ultra wide angle to super telephoto, different lenses can produce very different results depending on the configurations within the lens barrel.

INTERNAL WORKINGS OF A CAMERA



LENS TYPES

Lenses come in a variety of different shapes, sizes and focal lengths. Each one of these can be used to create very particular looking results, depending on their particular characteristics. Quite simply, lenses can be categorised into two main groups — prime or zoom lenses of different focal lengths. Prime (or fixed) lenses feature a fixed focal length and are known for delivering high quality images. They also generally offer much wider apertures compared to zoom lenses. Zoom lenses, on the other hand, provide a variety of focal lengths in one lens. This makes them very versatile and also reduces the need for multiple lenses. Within these two groups, lenses come in a variety of focal lengths, from fish-eye to super telephoto. The focal length is one of the key characteristics of a lens as it determines the angle of view as well as the magnification.

CAMERA LENSES

CHOICING A LENS

Lenses play an important part in photography — some may even argue that they're equally, if not more important, than the choice of camera, so choosing the right lens is critical. Choosing what lens to use depends on a variety of factors. Think about what you'll be using the lens for. Do you need the ability to quickly change focal length, in which case a zoom lens will be better than a prime lens. Do you often work in low light conditions where a large aperture will come in handy? If so, you'll need a lens with a larger aperture. Do you like photographing landscapes more, or people? Thinking about points like this will help you determine which lens will be best suited for the type of photography you want to do.

UNDERSTAND YOUR LENS

Looking at a lens, there are a number of numbers, letters and symbols that, at first, can look quite confusing. Although it might look like a lot to take in, these all indicate valuable information about the lens. Each of these numbers and letters tell you essential information like focal range, maximum aperture, lens version and focusing motor. Other features specified include stabilisation and filter diameter (this is usually found on the front of the lens and indicated by the symbol ø).

MACRO LENSES

You've possibly already heard the term 'macro photography'. If not, macro photography is extreme-close up photography, usually of small objects. This type of photography often requires using a macro lens. These are lenses that are designed for photographing small subjects at very close distances - they have lower minimum focus distances and 1:1 magnification (this means that the size of the image in real life is the same size as it's reproduced on the sensor). Macro lenses can also be used for other types of photography.

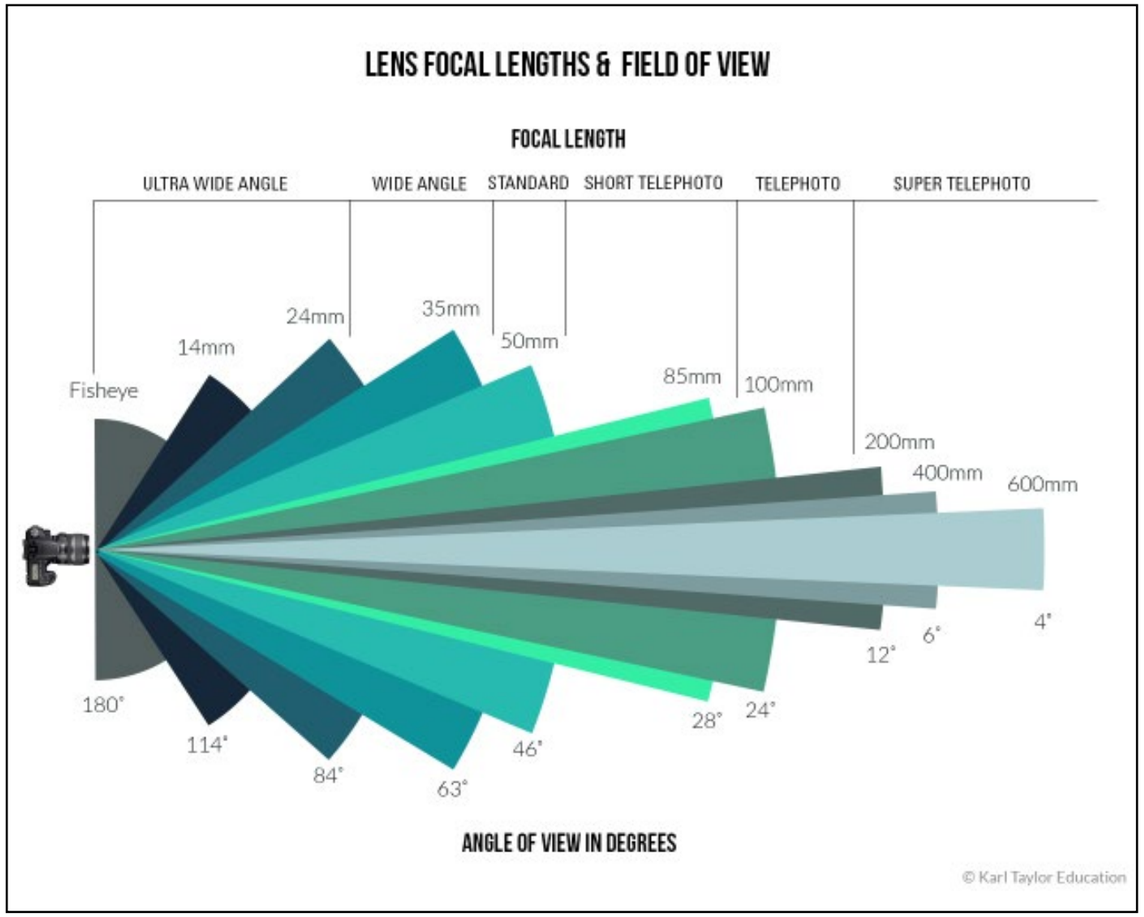
FIELD OF VIEW AND LENS FOCAL LENGTHS

When light enters a lens, the lens elements serve to converge the light to a single point of focus. The point where these rays converge is known as the focal point. The focal length is the distance between the camera's sensor and this focal point.

The focal length is one of the key characteristics of a lens as it determines the angle of view as well as the magnification. This is usually indicated both on the side of the lens barrel and sometimes on the front of the lens, along with the lens diameter. Ranging anywhere from 8mm to 2000mm, there's a wide variety of focal lengths, each of which are better suited to different genres of photography.

Lenses with shorter focal lengths provide a wider angle of view (and would therefore be better suited to landscapes than product photography) and less magnification.

The opposite is also true for longer focal lengths (which may be better suited to sport or wildlife photography than architectural photography).



LENSES AND APERTURE

Although not specifically a type of lens, aperture is another important feature of lenses.

As you'll already know from the previous chapters, aperture refers to the opening in the lens that controls how much light reaches the sensor. This is indicated in the format 1:2.8, for example, with the second set of numbers indicating the maximum aperture. Some lenses will feature two maximum apertures (shown as 1:4-5.6). What this means is that as you zoom, the aperture capability changes. So at the shortest focal length, you may be able to shoot at f4, but once you zoom to the longest focal length the widest aperture you'll be able to shoot at will be f5.6. Generally lenses with wider apertures are favourable due to their increased light capturing capabilities.

There is also a category of lenses that feature a fixed aperture. Catadioptric, or mirror lenses, which used to be fairly common, usually feature a longer focal length, such as 500mm at a fixed aperture of f6.3. Most telescopes are catadioptric.

SUMMARY OF LENSE TYPES

FISH EYE LENSE

A fish eye lens, produces a unique perspective of an ultra wide hemispherical image. Their angle of view is very wide which can have many benefits, but notably they produce strong visual distortion and are limited to a shallow depth of field.

SUPER WIDE ANGLE LENSE

Whilst a super wide angle lense also offers a pretty wide angle of view, it does not distort in the same way the fish eye lens does. Also this lens is capable of capturing a slightly deeper depth of field than the fish eye lens.

WIDE ANGLE LENSE

Whilst the angle of view of this lens is wide, it is not as much as the previous lenses mentioned. Yet, the focal length increases, so this lens will enable the potential for slightly smaller aperture settings than the previous lenses would.

STANDARD LENSE

As the name suggests, a standard lens (which is typically the lens to come with a newly purchased camera), offers a standard focal length and a standard field of view. It is a good lens to start with as it will offer you the most versatility.

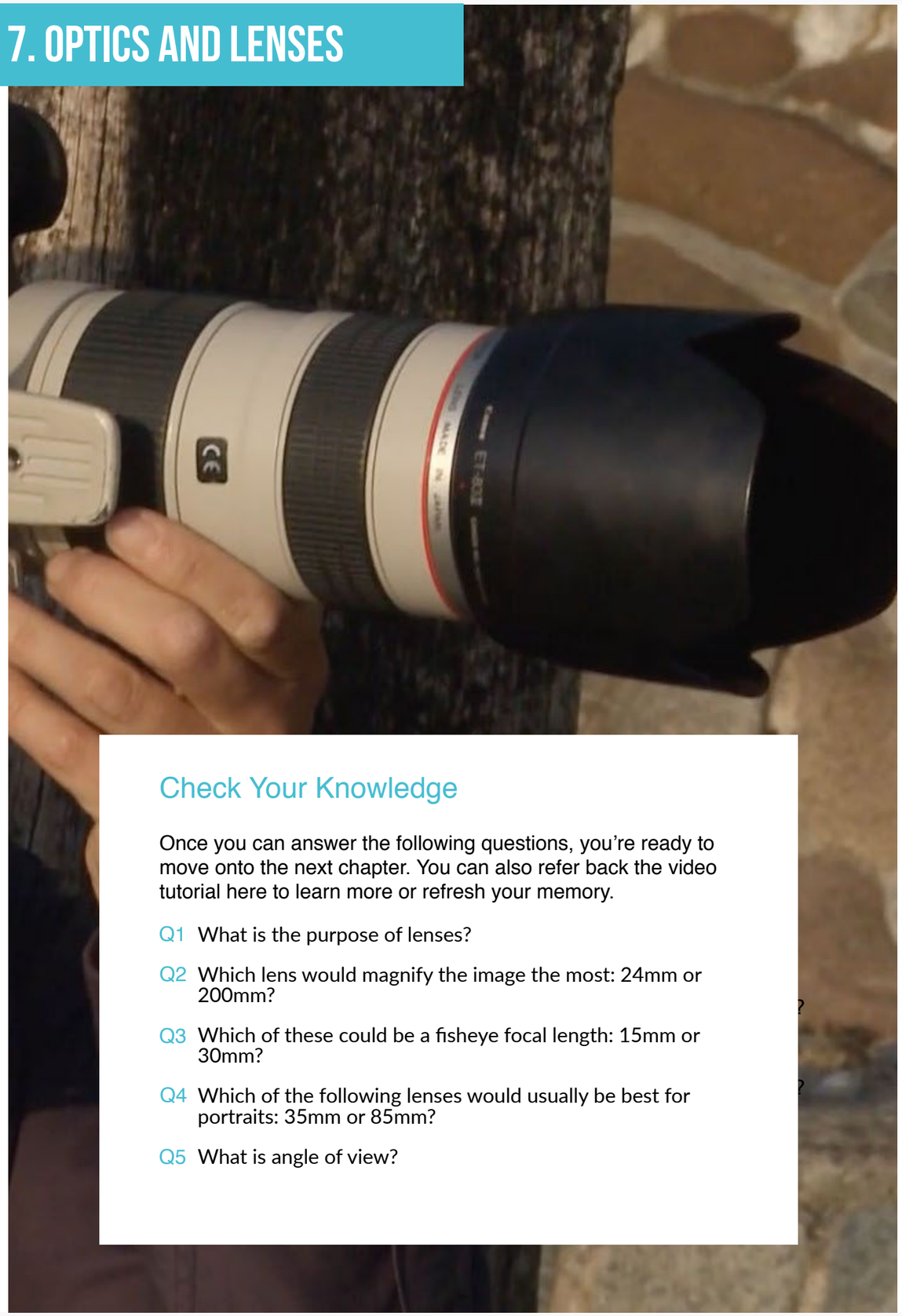
SHORT TELEPHOTO LENSE

As you can see by the image below, a short telephoto lens will allow you to focus and zoom in at objects in the distance, since they obtain a long focal length. However, as a result their field of view is decreased fairly considerably from the standard lens.

SUPER TELEPHOTO LENSE

The super telephoto lens is a specialist lens with an extremely long focal length. They are typically associated with wildlife photography, since it is not always possible to get close to a wild animal. The field of view however is only four degrees!

7. OPTICS AND LENSES



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 What is the purpose of lenses?

Q2 Which lens would magnify the image the most: 24mm or 200mm?

Q3 Which of these could be a fisheye focal length: 15mm or 30mm?

Q4 Which of the following lenses would usually be best for portraits: 35mm or 85mm?

Q5 What is angle of view?

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CHAPTER 8

UNDERSTANDING LIGHT

An Introduction To The 6 Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

UNDERSTANDING LIGHT

TYPES OF LIGHT

There are countless ways photographers can utilize light in their images and it is important to start recognising these in the world around you, as well as in other photographer's images, in order to really start getting an understanding of the effects of light in your own photography. During this chapter explanations and examples are given on the following; common lighting terms, simple combinations of light, the white balance setting in your camera and the kelvin scale.

Lastly, the effects light can have on the emotion of the image is explored with examples from my own photography.

HARD LIGHT- POINT LIGHT SOURCE

Hard light must come from a point, or small light source. A good example of this from nature is the sun. This may, at first, seem confusing as the sun is obviously extremely large, however when it comes to lighting in photography, everything is relative to the subject. Since the sun is extremely far away, it is small in relation to the model.

SOFT LIGHT-HOMOGENEOUS LIGHT

Soft light, the opposite of hard light, is a homogenous light source which means it is evenly distributed. This type of lighting can look dull, unlike hard light, since it does not create any distinct shadows or highlights. An example of soft lighting, would when the sun is being diffused by a blanket of clouds on an overcast day.

NATURAL LIGHT

Natural light, any light sourced from the sun, is an essential tool for many photographers and best of all, it's free and all around us! This being said, typically it is preferred by many photographers shooting outdoors to do so in, what is commonly known as, 'the magic hour'. This is an hour before and after sunset and sunrise.

AMBIENT LIGHT

Ambient light refers to the light that is already present in a scene, or in other words it is the availible light, it is also commonly known as 'general lighting'. Ambient light is used to describe light that the photographer did not add to his image, since it already existed in the environment they photographed in.

REFLECTED LIGHT

Direct light, the opposite of reflected light is light that has entered the camera lens directly from the light source- for example an image of an illuminated light bulb. Reflected light occurs when anything has been lit by a direct or reflected light source, an example of this from the image below would be the sea as it reflects the sun.

TRANSMITTED LIGHT

Transmitted light is light that has passed through an object, as opposed to light that has come from a direct light source or that has been reflected off a surface. In the example below the light that has passed through the glass and lbeer before reaching the lense and being captured is transmitted light.

COMBINING LIGHT

COMBINATION: HARD & SOFT LIGHT

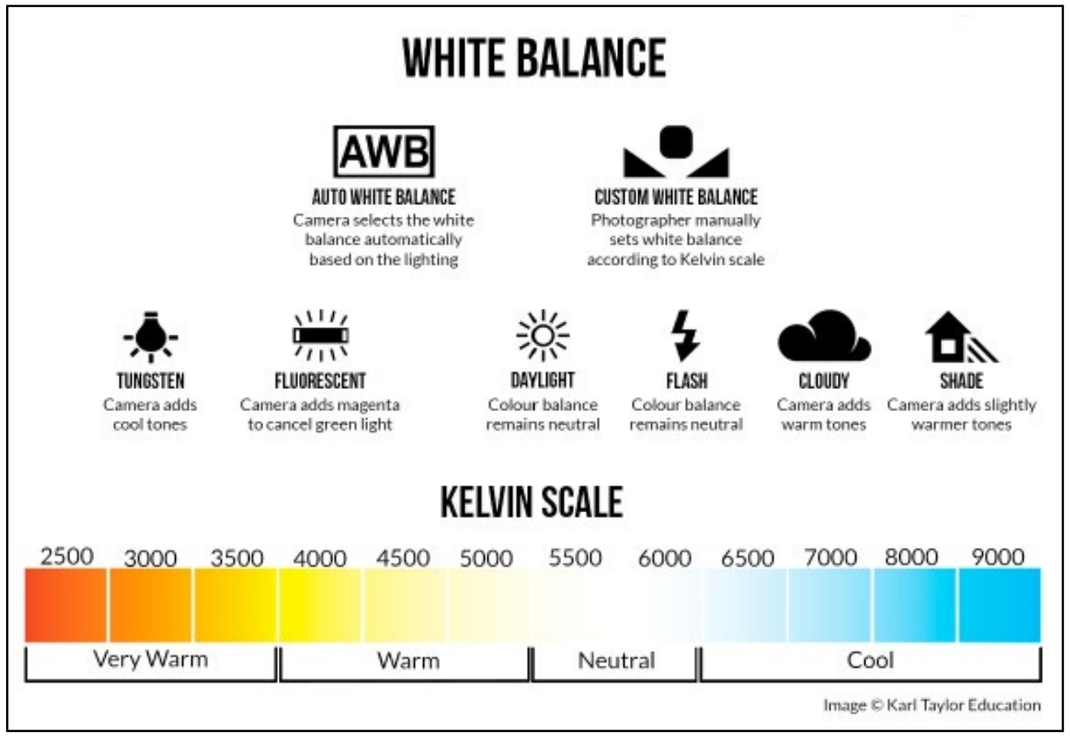
COMBINATION: TRANSMITTED AND REFLECTED LIGHT

COMBINATION: NATURAL LIGHT AND ARTIFICAL LIGHT (FLASH)

COMBINATION: SOFT LIGHT AND REFLECTED LIGHT

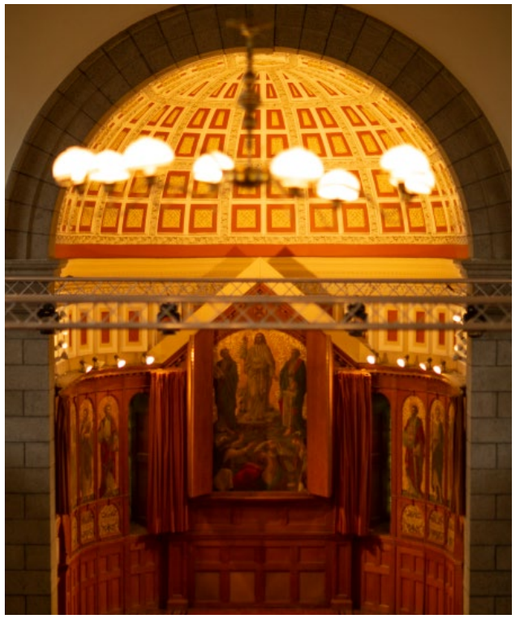
THE COLOUR OF LIGHT

THE KELVIN SCALE



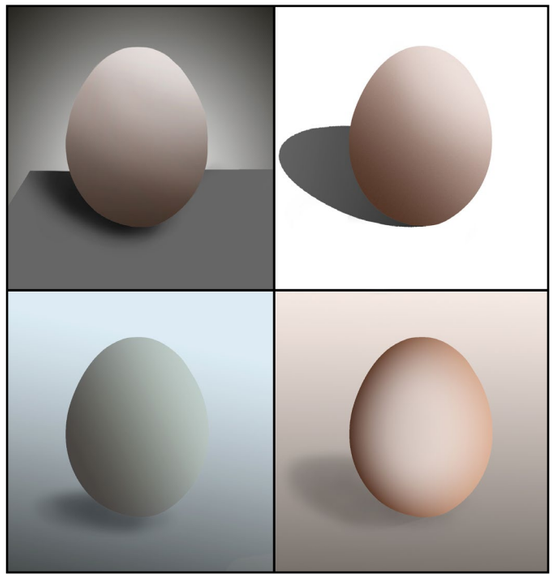
CORRECT WHITE BALANCE

INCORRECT WHITE BALANCE



EFFECTS OF VARIATIONS OF LIGHT

THE EGG LIGHTING CHALLENGE



HOW CHANGING THE LIGHT CAN CHANGE THE MOOD OF THE SHOT

SUMMARY OF TYPES OF LIGHTING

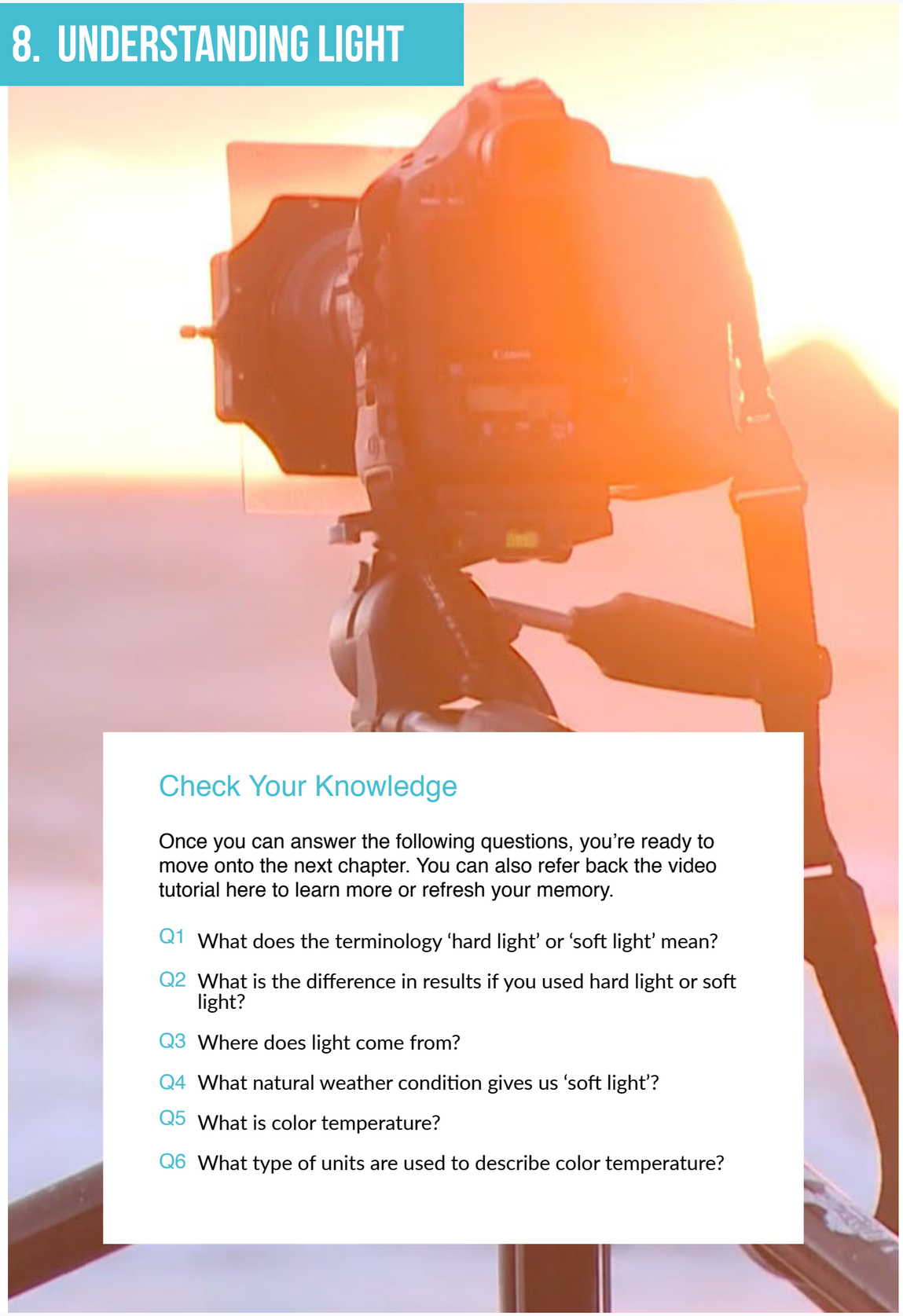
RIM LIGHTING

SIDE LIGHTING

LIGHTING FROM BELOW

BACK LIGHTING

8. UNDERSTANDING LIGHT



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 What does the terminology 'hard light' or 'soft light' mean?

Q2 What is the difference in results if you used hard light or soft light?

Q3 Where does light come from?

Q4 What natural weather condition gives us 'soft light'?

Q5 What is color temperature?

Q6 What type of units are used to describe color temperature?

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CHAPTER 9

THE RECORDING MEDIUM

An Introduction To The 6 Essentials of Photography

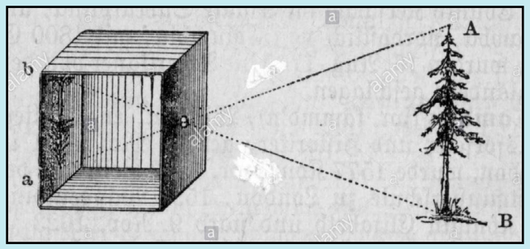
Light • Subject • Optics • Aperture • Time • Recording Medium

WHAT IS THE RECORDING MEDIUM?

As previously introduced in chapter one, in its most simple terms, the recording medium is how the camera records an image. Once the light has passed through the optics of the camera and the aperture, an image is recorded. Traditionally in the days of film an image would be recorded through a chemical reaction triggered by the light when exposed to the photographic film. In today's camera photographic film has been replaced by digital sensors. There are a variety of camera sensor sizes, which are outlined later in the chapter. However, in principle, they all function in the same way. A digital sensor uses an array of millions of tiny light sensitive photosites (otherwise known as cavities). Once the light has been exposed to these photosites, during the time the shutter was open, they collect photons and record these as an electrical signal. An assessment is made on how many photons fell into each photosite by measuring the strength of the electronic signal. This digital data is then recorded by the camera's memory card where they can be transferred to your computer.

THE CAMERA OBSCURA

The camera obscura, in Latin, means "dark chamber" and was used in the 16th century as a visual aid for artists. The light enters the dark space through a tiny hole and is projected as an inverted image onto the back wall of the camera obscura. By the 19th century, it became possible to record the projected image using photosensitive materials, such as film. In the most simplistic terms, similar mechanics are replicated today in modern cameras. The small hole has been replaced by the aperture and the back wall of the camera obscura has been replaced by the camera sensor that records the image.



TYPES OF RECORDING MEDIUMS

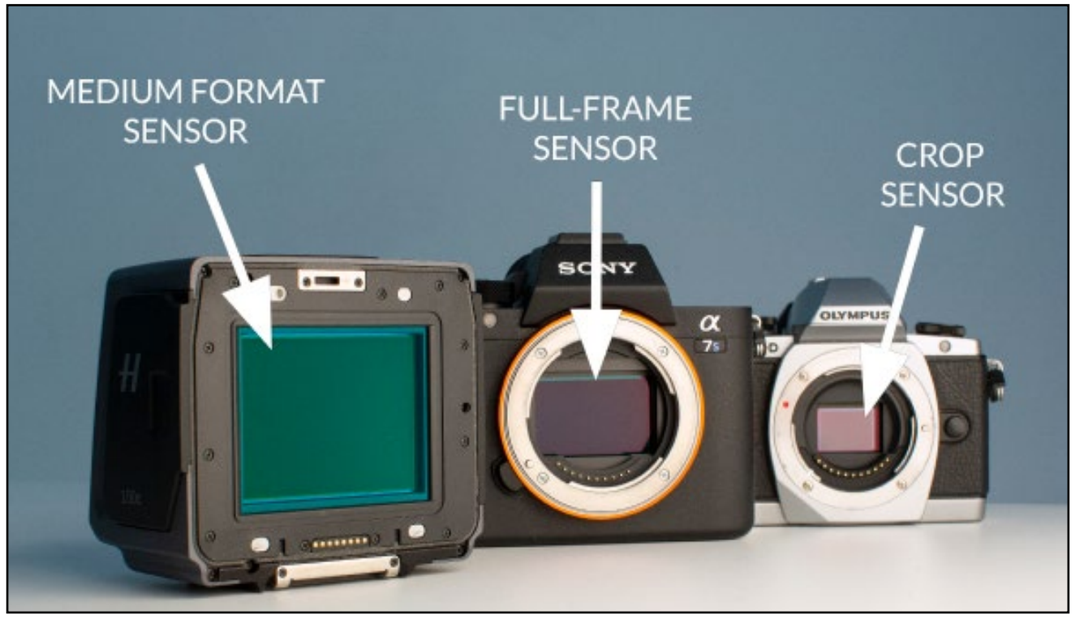
Depending on your camera, there are different types of sensors. The two main types of sensors are CCD (Charge-Coupled Device) sensors and CMOS (Complementary Metal-Oxide Semiconductor) sensors. CCD sensors, until recently, used to be the most commonly used type of sensor due to their superior image quality, dynamic range and noise control. However, as technology has progressed, CMOS sensors have now taken over. In short, larger sensors offer the highest quality while smaller sensors provide a more economic option, but still deliver great results. Image quality is partly determined by factors such as the sensor itself, the resolution (number of megapixels) and ISO. To understand image quality, it's important that you understand what each of these terms means. During this chapter comparisons are shown to illustrate the variations in picture quality between different sensor sizes and the megapixel capabilities of various cameras, the variations in ISO settings the file sizes JPEG and Raw.

FILM

As previously noted, digital camera sensors are not the only way to record an image: film cameras remain an option to photographers today. Yet notably just as sensor size varies so does film size; from 12, 24 & 36 exposures to even larger medium format film.

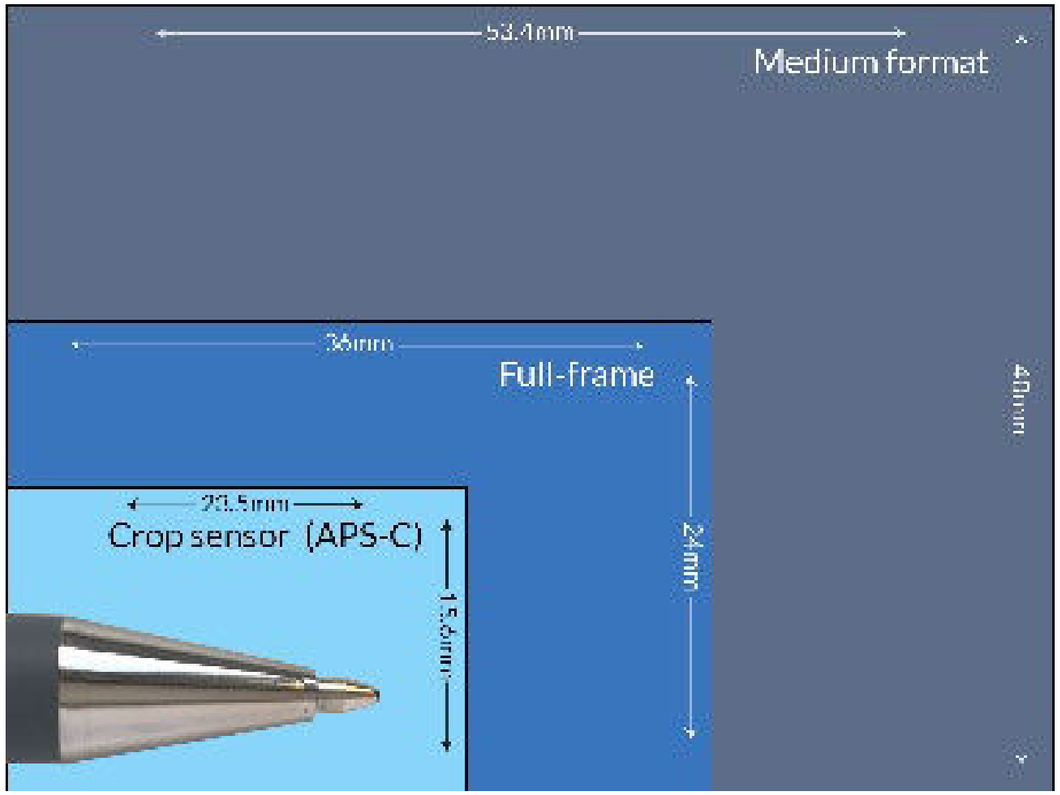
CAMERA SENSORS

Camera sensors also come in different sizes (these sensor sizes are also referred to as 'formats'), with smaller sensor sizes offering lower image quality compared to that of larger sensors. Most commonly, you're likely to have heard of full-frame, crop-sensor and medium format cameras. But what do each of these mean?



SENSOR SIZES

Crop sensor cameras, also referred to as APS-C, are the smallest of the sensor sizes and have a pre-determined crop applied to them. Measuring at approximately 23.5mm x 15.6mm compared to the 36mm x 24mm full-frame sensor, they are smaller, lighter and more affordable than their full-frame counterparts. Full-frame sensors do not have a pre-determined crop, and because of their larger sensor size they offer better image quality and enhanced performance in low light conditions. Medium format cameras offer the largest sensor of these three options. The benefit of this 53.4mm x 40mm sensor is that it allows for much higher resolution compared to cameras with smaller sensors. Mostly used by professionals, this quality does come with a much higher price tag than crop sensor or full-frame cameras.



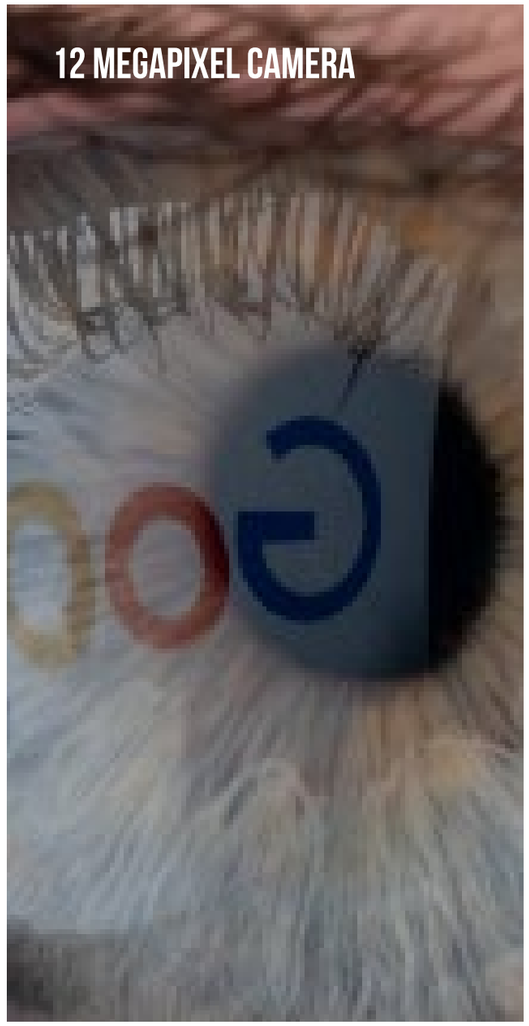
MEGAPIXELS AND RESOLUTION

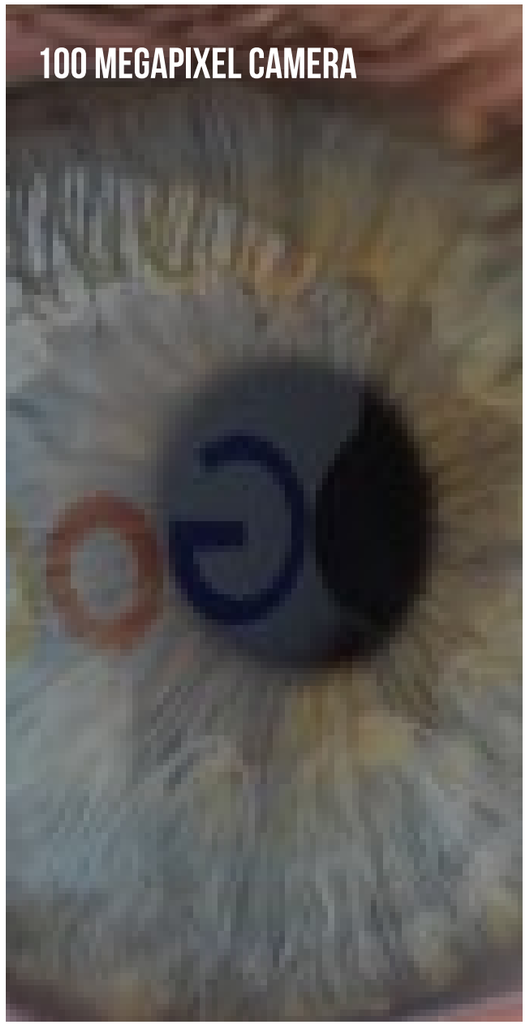
Used interchangeably, megapixels and resolution actually mean two very different things and it's important to understand the difference if you want to get the most out of your images. Camera megapixels sizes vary and as effect so does the camera's capabilities in capturing more or less megapixels and results in varying image qualities. Resolution on the other hand refers to the camera's capabilities in storing that digital data in the memory card. Essentially, the more compression an image undergoes in order to be stored, the lesser the resolution of the image.

MEGAPIXELS

One megapixel is made up of a million pixels, which means that a 24 megapixel camera will record an image that is made up of 24 million pixels, while a 16 megapixel camera will record an image with only 16 million pixels. Each of these individual pixels contain information that makes up the final image. When determining image quality, it's not only the number of megapixels that matters, but also the size of the photosites (these are what record pixels). Photosites are measured in microns (μm), and their size is largely determined by the sensor size. Cameras with smaller photosites may perform worse in low light conditions and also feature more diffraction when shooting at small apertures, whereas larger photosites allow for a larger transitional tonal value, greater tonal accuracy and better color accuracy. Refer to the images on the right for comparisons of results from a 12 and 100 megapixel camera.

MEGAPIXEL CAMERA SIZES



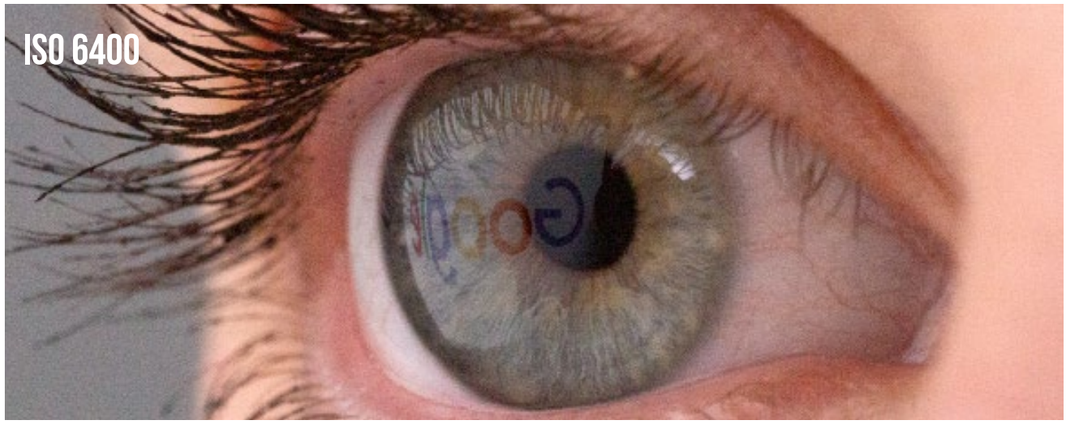


RESOLUTION

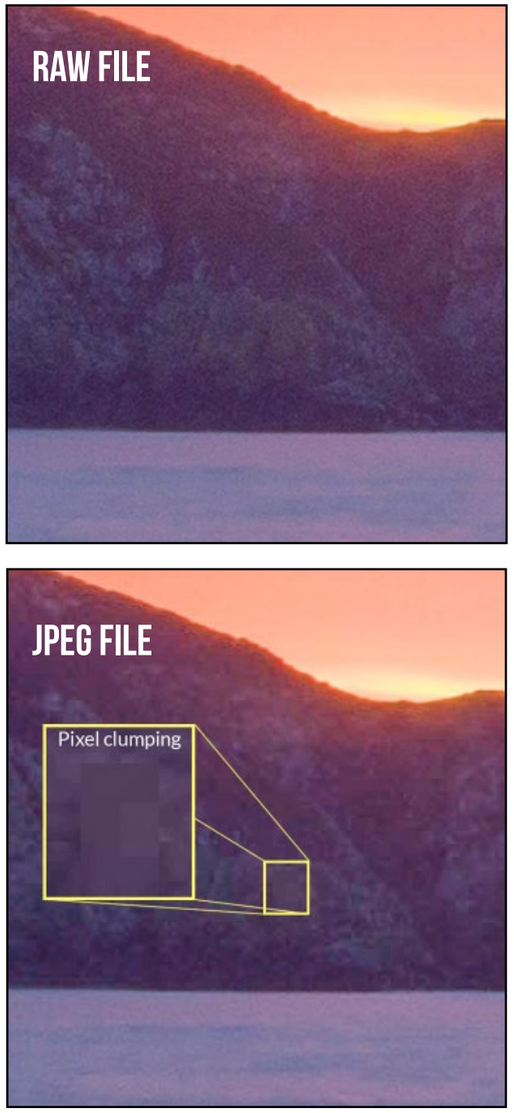
The resolution of an image is determined after the image has been recorded by the camera's sensor, during the compression stage where the digital data recorded on the camera sensor is converted to be stored on the camera's memory card. Algorithms were developed to examine the data that makes up the image in order to reduce the supposed redundant data and in turn too reduce the storage requirements. This process is called compression and essentially the more compression an image has to undergo in order to be stored, the lesser the picture quality will be. Therefore, in order to retain the highest picture quality, the optimum memory storage card for your camera would be most appropriate. This being said, it is not essential and is most appropriate to consider when the photographer intends to be print their images on a very large scale, as this is when the resolution quality would really start to show.

ISO

ISO measures how sensitive the recording medium is to light. We can adjust our cameras to be more or less sensitive to light by simply adjusting the ISO. Higher ISO numbers are more sensitive to light, whereas lower ISO numbers will be less sensitive to light. While increased sensitivity may sound good in theory, the main drawback is that higher ISOs result in a degradation of image quality, which often appears in the form of ‘noise’, especially in the shadow tones (as you would have seen in the video).



JPEG VS RAW



Another factor that relates to image quality is the type of file format you shoot in — either JPEG or RAW. Although both file types contain the same number of pixels, RAW images store far more information within those pixels than JPEG images do.

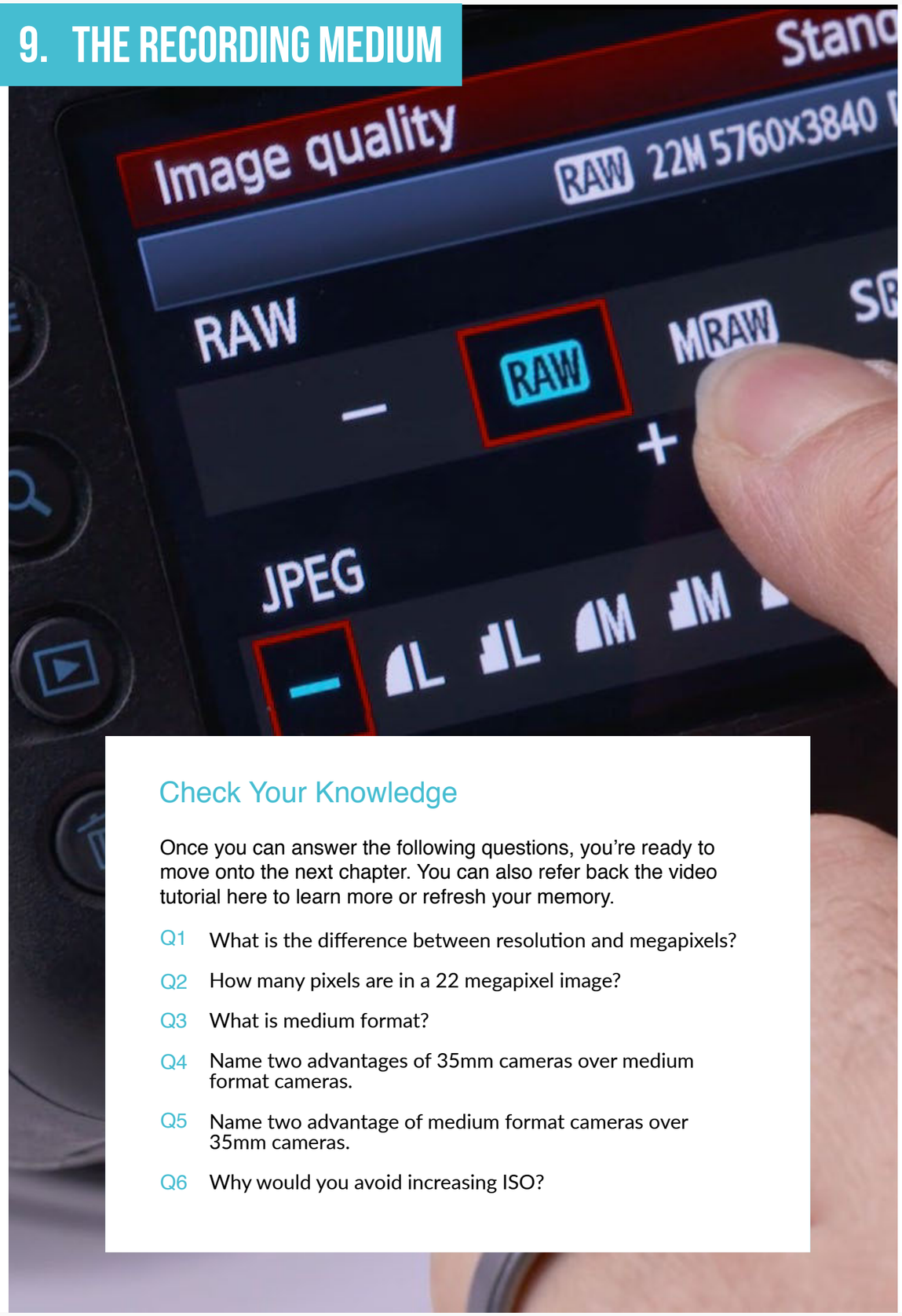
This means we have far more control in the post production stage with a RAW image, which can be very useful if you want to make changes to your pictures after shooting.

As I explain in the video, one of the main drawbacks of JPEG files is that the compression can sometimes result in what’s known as ‘pixel clumping’. This is when pixels of a similar tone are grouped together. Although this may not initially seem apparent, it does become more obvious as soon as we start to adjust colours and exposure in post production. Although JPEGs may not allow us to extract as much colour detail, especially in highlight or shadow areas, they are still a common file type for photographers who shoot high volumes of image (such as wedding or sport photographers). This is because, do to their compression, JPEGs produce much smaller file sizes, allowing you to fit many more images on a memory card.

SUMMARY

Each of these factors contribute to image quality, but it’s not to say that you have to shoot with the camera with the largest sensor, with the most megapixels and at the lowest ISO. The points above will help you understand image quality, but you shouldn’t in any way be put off if you don’t have a top end camera. Most of the cameras on the market today are of exceptionally high quality, far greater than those from the days of film - and those cameras produced some of the most iconic images of our time! If you have the right knowledge, you can create amazing quality images with any camera.

9. THE RECORDING MEDIUM



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 What is the difference between resolution and megapixels?

Q2 How many pixels are in a 22 megapixel image?

Q3 What is medium format?

Q4 Name two advantages of 35mm cameras over medium format cameras.

Q5 Name two advantage of medium format cameras over 35mm cameras.

Q6 Why would you avoid increasing ISO?

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CHAPTER 10

THE COMPOSITION

An Introduction To The 6 Essentials of Photography

Light • Subject • Optics • Aperture • Time • Recording Medium

WHAT MAKES A GOOD COMPOSITION?

It is clear when an image is well composed, but it is not commonly understood why this is the case. There are many elements that make up a strong composition and it can takes years of study and practice to master the complexities, through a deeper understanding of human visual perception. None of the less, there are some simple guides to follow that will start you on your journey of understanding composition. This chapter will explore these guides with visual examples. It is important to firstly be able to identify these guidelines in practice to be able to experiment with implementing them with your own photography. The first compositional guidelines outlined in this chapter are leading lines, framing and symmetry (typically used to guide the eye into the main focus of the image), next the benefits of particularly colour combinations are examined and lastly the common rules of composition, rule of thirds and the golden spiral, are demonstrated.

GUIDLINES TO CONSIDER

The implementation of the compositional guidelines explored in this chapters outlive the practice of photography. They were in fact initially explored in more detail by the French Impressionist painters from the 19th century. They explored compositional techniques - such as lines, shapes, tones and colours - in order to arrange a painting in such a way that would lead the eye to the focal point of the painting. So how does this apply to photography? Firstly, when taking an image, it is important to identify what the subject of focus is. For example, in its most simple form, in portrait photography this is typically the eyes of the subject, in seascape photography it is typically the sun as it rises or sets, in architectural photography it is the building, in fashion photography it is the outfit, in journalistic photography it is the narrative and in product photography it is the product. Secondly, as a photographer, it is then your job to consider the perspective of shot that is going to best make the subject the main focus point of the picture.

LEADING LINES

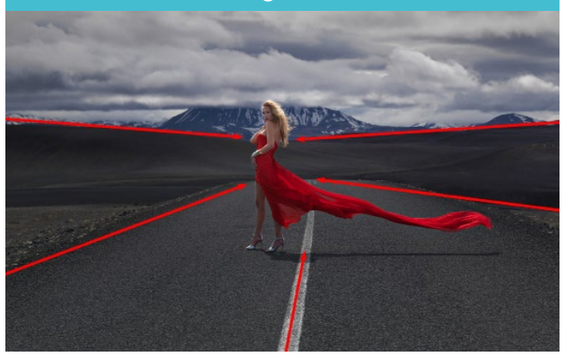
Leading lines are lines (or curves) that guide the viewer's eye to the subject. Anything from fence posts to winding roads, leading lines can be straight, curved, diagonal or converging. These lines help keep our eye in the frame and draw attention to the subject.

Here are some examples of leading lines being implemented. In the top image the model, standing just off the center of the image wearing a long floaty red dress, is the focal point. Our eye is guided into the image from both the left, right and centre by leading lines. The leading lines on the left and right are created by the edges of the road and the mountains in the background. The leading line in the center is created from the white paint on the road.

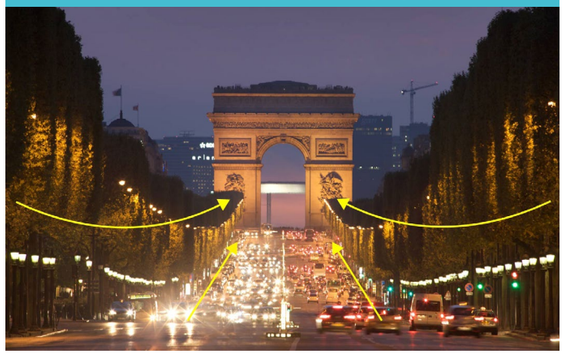
Alternatively, in the image below, the archway is the focal point of the picture. The eye is guided to this point from the combination of symmetry and the leadings lines created by the trees and the road.

Finally in the fashion shot situated in a cityscape the main focus of this image is the brilliant yellow dress on the model. The leading lines in this image contribute towards this, since they are all pointing in that direction. Our eyes are drawn towards the model by the lines captured on the floor, as well as by the horizontal lines from both sides. One could examine this image even further and identify that even the clouds and buildings skyline leads towards the model.

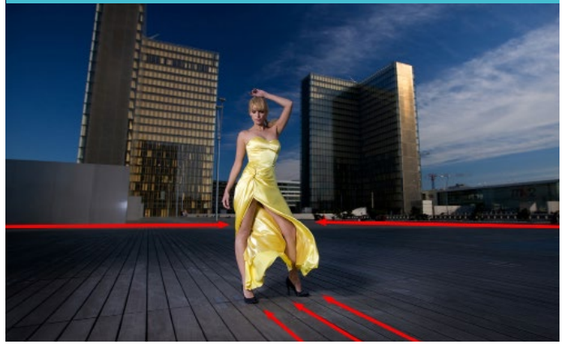
Discover this course: Highlands road shoot



Discover this course: Night photography



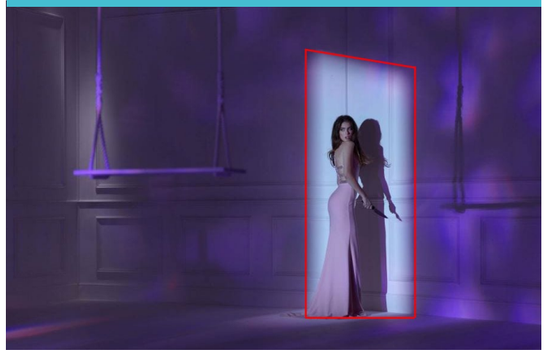
Discover this course: Stunning location lighting



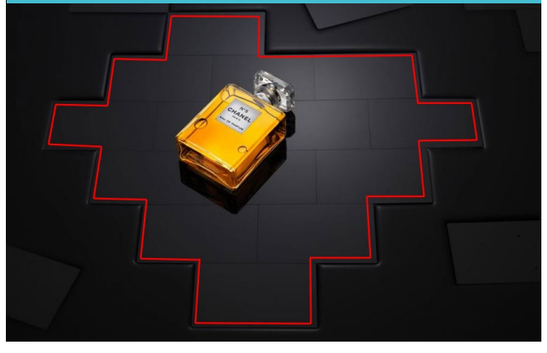
FRAMING

As the name suggests, framing is when you use other elements within the image to frame the subject. As shown below, examples of framing, can be anything from shaping light, to a thoughtfully constructed backdrop, but you could use anything available to frame your subject! Framing not only can add additional elements of interest, it can also add perspective and a sense of scale to your images.

Discover this course: Highlands road shoot



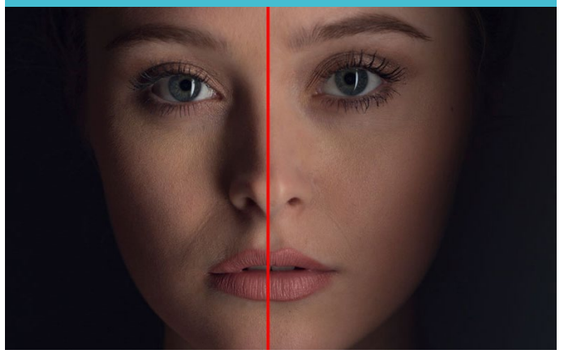
Discover this course: Highlands road shoot



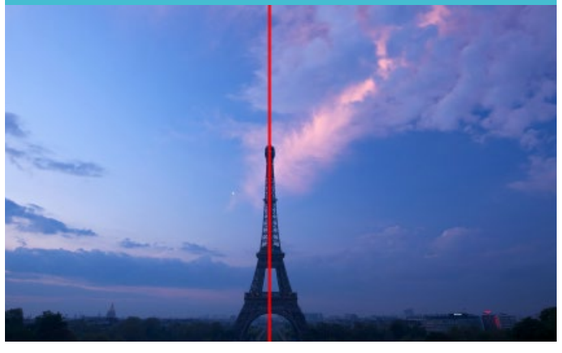
SYMMETRY

Symmetry can be observed all around us in nature and is commonly associated with beauty. Symmetry- or the line of symmetry- refers to a line that splits an image in half either vertically or horizontally. If each side of the line mirror each other then the image is understood to be symmetrical. Symmetry can be very effective when used correctly. Often quite striking, symmetry can help remove or minimise additional distractions and focus the eye.

Discover this course: Moody two light control



Discover this course: Sunrise photoshoot

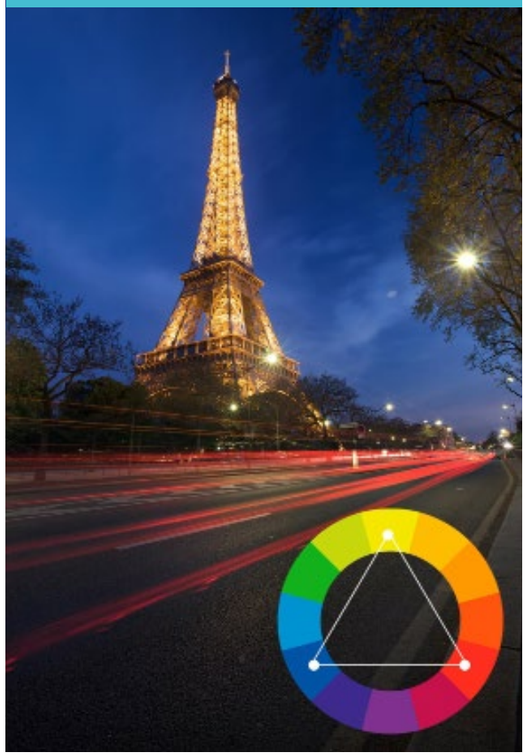


COLOUR

Colour is an important part of photography and we can use this to even greater effect with some careful thought. Colours can be used to change or influence the mood and feel of an image or to draw attention to particular elements. Using juxtaposing colours within an image can be a particularly effective way of catching the viewers attention, as I show in the examples in the video.

Discover this course: Paint explosion shoot

Discover this course: Shooting car trails



THE RULE OF THIRDS

One of the most well known compositional rules, the rule of thirds divides the image into three rows of three, splitting the image into nine equal blocks. The idea is to position important elements so that they fall either on the dividing lines or at the points of intersection. The reasoning behind this rule is that by placing objects within these areas helps to create more interest in the image than if you were to simply centre the subject.

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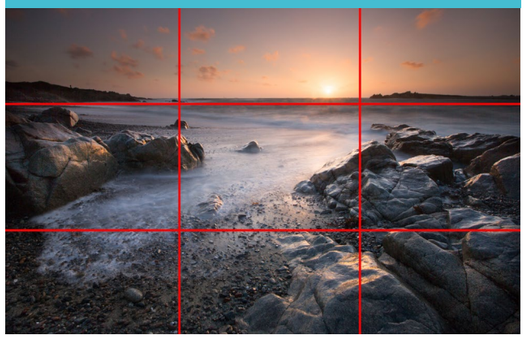

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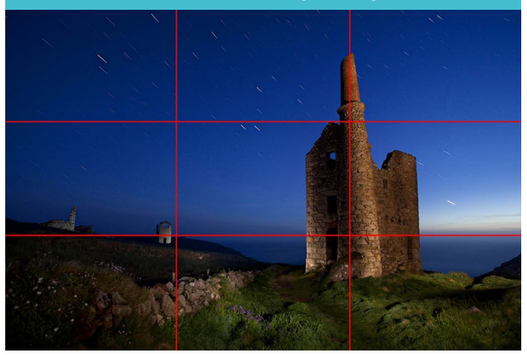

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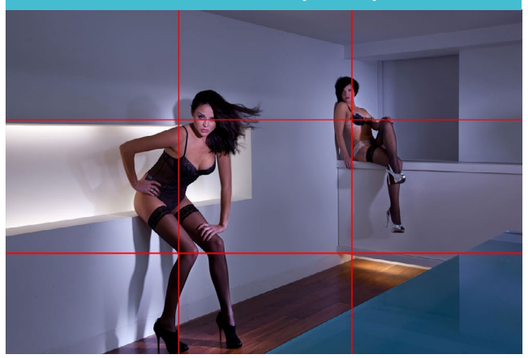

THE GOLDEN SPIRAL

Golden ratio - The golden ratio is a mathematical formula that relates to Phi (1.6180339…). Two quantities (a and b) fit the golden ratio if b is to a what a is to the sum of a + b. In this ratio, a is 1.6180339 times bigger than b. This formula forms the basis for other compositional rules, such as the golden spiral and even to some extent the rule of thirds.

Golden spiral - The golden spiral, developed by Fibonacci, is, contrary to its name, composed out of a series of Phi Grids. These grids determine the path of a snail-shaped spiral (known as the Fibonacci Spiral), which guides your eye around the image to the focal point.

While it's important to keep these compositional rules in mind when photographing, the most important aim is to maintain your viewer's attention and keep their eye in the frame. This can be done using other techniques that link to the human visual system, such as left to right bias, contrast, colour, narrative etc. This is covered in detail in our 'A Visual Journey' workshop, which you can read about here.

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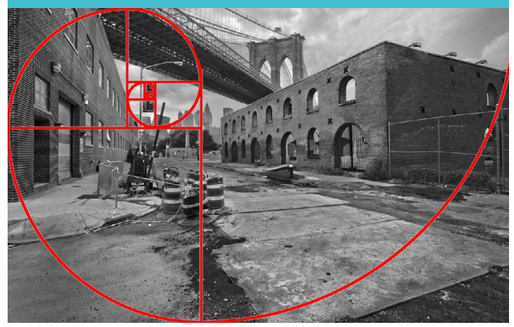

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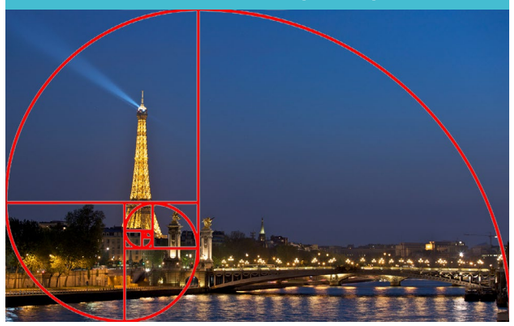

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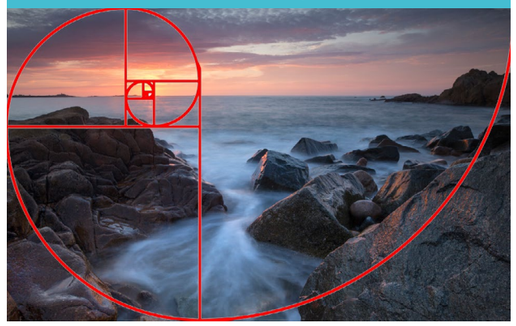
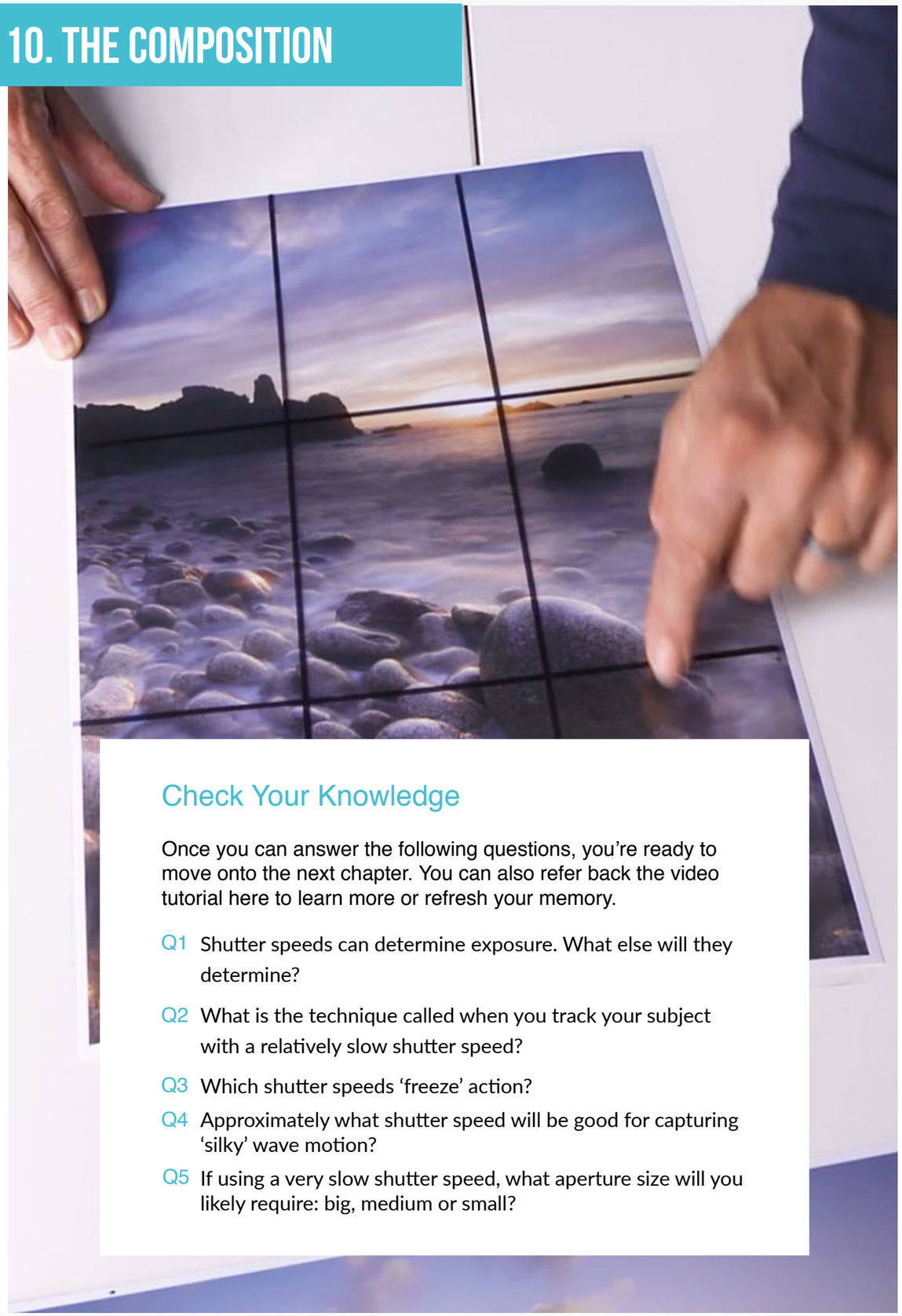


SUMMARY

As photographers, our goal is always to keep the viewer connected with our images, and while it can be beneficial to try and follow these guidelines, good photography comes down to far more than just good composition. It's therefore important to make sure you have an understanding of everything we've covered in this course: how cameras work, how time and aperture can be used together for creative imagery, optics and their differences, the importance of light for conveying emotion and the different types of recording mediums and how these relate to image quality.

10. THE COMPOSITION



Check Your Knowledge

Once you can answer the following questions, you're ready to move onto the next chapter. You can also refer back the video tutorial here to learn more or refresh your memory.

Q1 Shutter speeds can determine exposure. What else will they determine?

Q2 What is the technique called when you track your subject with a relatively slow shutter speed?

Q3 Which shutter speeds 'freeze' action?

Q4 Approximately what shutter speed will be good for capturing 'silky' wave motion?

Q5 If using a very slow shutter speed, what aperture size will you likely require: big, medium or small?

"SUCCESSFUL COMPOSITION WILL KEEP THE VIEWERS EYE FROM LEAVING THE PICTURE AND RATHER CAUSE THE EYE TO CIRCULATE AND EXPLORE THE PICTURE.

KARL TAYLOR

Watch related class

WHAT NEXT?