Mick Waters introduces **Jane Hewitt** and

Learning through a lens

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Photograph © Susannah Ireland

Introduction by Mick Waters

Not many years ago photography was less immediate than it is now. Where people used to take a photograph, wait until the film was used, send away the film for processing and wait for its return to see whether they were satisfied with their effort, they now point and click. They might not even point a camera; a phone or a tablet is waved and the image recorded. Satisfaction or otherwise is addressed immediately and the photo stored or despatched to anyone who might be thought to wish to enjoy it, or it might even be made available on the web to anyone who might come across it. It is virtually impossible to fail at photography; indeed failures are a source of mirth and can be deleted as quickly as they were taken. Some iconic events are viewed through the lens by seemingly everyone in attendance and the image seems as important as the experience.

If only children were encouraged to enjoy writing with such abandon! Have a go, experiment, laugh at mistakes, show people examples you are proud of or your latest effort, comment on each other's … enjoy it! This enjoyment would be a good starting point for in-depth teaching of the power of writing and the ways in which we can get better and better at it. This book uses enjoyment as a starting point and explores in-depth learning by helping the teacher to understand potential and possibility in their teaching.

Jane Hewitt has produced a brilliant book for teachers to show them how they can exploit an interest that pupils will take to naturally. It is a pleasure to introduce her and her work.

As you read this book, you will find ways to build on the strengths in your own teaching. There are ideas, straightforward explanations, extended examples, starting points and

helpful suggestions. It is one of those books that you can work through from front to back or you can open it at a particular place to help you though the next part of the teaching repertoire.

The book addresses the subjects of the curriculum. Subject disciplines, and their programmes of study, all contain content which falls into three types of learning. Every subject tries to teach pupils 'how to …' do things; setting out the skills which help pupils to become secure in the subject. Next comes teaching 'about' the subject; exploring and learning the knowledge associated with it. Third comes learning 'through' the subject; learning elsewhere is opened up through proficiency and knowledge.

Jane explores these three areas so well in her book. She offers the teacher the chance to find out how photography works. There is detailed explanation of how the camera works, how to use it well and how to move from being a happy snapper to someone who can compose and structure a photograph that will have real impact.

There are plenty of opportunities for learning about photography. The section on technique covers the 'camera basics' and when this is added to the essence of composition the book moves into the realm of art. The uses of photography as a form of expression, persuasion or investigation will guide you and your pupils into so many subject discipline realms. Jane brings across the power of photography and offers a rich source of talking points, in depth discussion and debate that can be started in assembly, form time or lessons.

Photography may not be a curriculum subject in the traditional sense but the chance to 'learn through' photography so that it becomes the vehicle for other learning is cleverly presented in the book. Jane manages to offer suggestions and ideas that can be used directly or adapted to bring learning alive for teachers, either by studying with photographs as a resource or by using photography as the touchstone, the hook or the magnet to grab the pupils' attention and take them to new depths in subjects such as science, history or geography. The fascinating practical work on pinhole cameras and camera obscuras, for example, will take pupils into scientific concepts and social niceties of a by-gone historical age. The consideration of apps, iphoneography, and their usage, which flow through the book, will exploit the computer science and technology requirements of a curriculum.

The book offers ways in which difficult concepts in citizenship or PHSE can be addressed through the use of photographs and the engagement of pupils in photography to highlight or exemplify awkward issues. Suddenly the challenge of the embarrassing conversation is eased by the chance to deal with images rather than words. Similarly, concepts that schools often find difficult, such as teaching pupils about protest or

campaigning, become more immediate through well-chosen photographs … and Jane offers plenty of those.

By reading the book, you will get to know Jane. She has vast experience as a teacher and knows how to connect with pupils. One connection is through photography. Her professional approach will help you to build upon your own and the ideas, techniques and suggestions will help you to explore learning in new ways, whatever the subject discipline.

Do enjoy this book with the pupils that you teach.

Smile please!

Why photography?

Imagine being told that you could introduce a device into your teaching that was easily accessible and would enable you to be creative. This device comes in a variety of forms and with a range of price tags to suit all school budgets. It will motivate pupils but will also create laughter as well as deep learning and thoughtful reflection. You won't need any real training to use it – you can learn, with your pupils, as you go along. It will allow for mathematical and scientific ideas to be mixed in with art and literacy. And it will stimulate discussion – it may cause controversy, too, but it will certainly get a reaction.

Have I convinced you? Great. But, in fact, you already own at least one of these amazing devices – a camera, smartphone or tablet – so all you need to do is unlock their potential and see how these amazing tools can be used. I hope this book will open your eyes to the ways in which you can use both new technologies and your own skill set to get creative with photography.

Are there skills that you wished you had? I always wanted to be able to draw or play a musical instrument. Sadly, I can do neither. I have tried, really I have, but I was asked to leave the school 'orchestra' at the age of 11 and given the role of stage hand (it still stings even after forty or so years). My drawings look as if a small child has done them and no amount of telling myself, or anyone else, that they are 'abstract' makes them look any better.

Nevertheless, I believe that some skills can be taught and vastly improved by practice. Matthew Syed, in his book, *Bounce* (aptly subtitled *The Myth of Talent and the Power of Practice*) creates a really convincing argument for the power of practice.[1] However, one might argue, as in my case, that if you don't have a modicum of talent in the first place, how can you improve upon it?

Its not what you look at that matters ...
it's what you see.

Henry Thoreau

1 M. Syed, *Bounce: The Myth of Talent and the Power of Practice* (London: Fourth Estate, 2010).

Despite not being able to draw, I have always seen myself as a creative person and I would get really frustrated when I had ideas that I wanted to turn into concrete images. Working with children, I know how powerful it is when you can show them examples and when they can visualise their ideas.

My 'eureka' moment came when I was asked by our gifted and talented coordinator to look into buying a digital camera. Following hours of browsing, we spent £350 on a 3-megapixel camera. That in itself shows how quickly technology is moving on. I now have a phone with a 5-megapixel camera and several (OK, loads of) apps that I can use for editing photos.

At the time, my Year 10 form were happy to get involved, so we spent some time just being silly with the camera – striking poses, pulling faces and taking snapshots during form time. The results were amazing and, more importantly, captured what we were doing – you could see the enjoyment, the interaction, the whole classroom experience … The rest, as the saying goes, is history.

If I look back now, the photos are undeniably not my best. Henri Cartier-Bresson talks about 'your first 10,000 images being your worst' and I suppose this goes back to the idea of practice that Syed describes. However, the beauty of photography is that anyone of any age or ability can enjoy and be successful at it.

I was working as an official photographer at a wedding recently when I was approached by an elderly gentleman who pushed his compact camera into my hand and asked me to 'get those lines back'. Following a rather confusing conversation, I realised that he meant the grid on his viewfinder that helps you compose using the

Your first 10,000 photos are your worst.

Henri Cartier-Bresson

rule of thirds (there is more on this in Chapter 1). If you'd asked him what the rule of thirds was he wouldn't have had a clue, but he did know that those lines helped him and he wanted them back! Instinctively, he was using the tools the camera provided. Having restored his lines, he went away enthusiastically snapping guests, flowers and passing waitresses – a smile on his face and happily interacting with other people, all due to the camera in his hand.

I have no formal qualifications in photography and I am completely self-taught. So, what then makes me think I can write a book on photography? First, this book isn't just about photography – it's about how we use photography to help children to learn. The title 'Learning through a Lens' is what this book is all about. Yes, there are hints and tips along the way, but this is in no way a photography manual.

Second, I have earned my stripes on the teaching front, with thirty years in secondary schools teaching a whole range of subjects and working as an advanced skills teacher for several years. This has given me the chance to work with and learn from some amazing practitioners. I was fortunate, in 2007, to travel to Uganda with some intrepid colleagues and spent two weeks working in schools there. The photographs that I took on this trip showed me just how powerful images can be in learning – some of them appear in this book.

My third justification for writing this book is that what I lack in formal qualifications, I make up for in passion for my subject, a keenness to learn, a willingness to experiment and the solid belief that *anyone* can use photography in their learning – and enjoy themselves at the same time. One of the beauties of photography

is that it is subjective. I might like an image, you might hate it – there are no hard and fast rules. I took what I thought was an 'arty' photograph of a bride and groom's feet. The bride, as all brides do, had spent a fortune on her shoes. The groom had been given some socks with camper vans on them. They loved this photo and put it in their album. My mum looked at it and said 'Oh love, you aren't very good are you – you've chopped their heads off!'

Showing children controversial photographs – in the sense that they will elicit a strong negative or positive reaction – can be an effective opener. I often displayed an image on the board when pupils arrived in my classroom, so they became accustomed to coming in and looking for the image. I tried to find photographs that would entertain, shock, have a wow factor – anything that would hook them in. The pupils might well come in and say, 'That's rubbish, that is', but they would at least be forming an opinion. It's like the old joke: how many photographers does it take to make a photograph? The answer is fifty – one to take the photograph and forty-nine to say, 'I could have done that'.

For one starter activity, I displayed *Rhein II*, the image that was sold by the auction house Christie's for US$4.3 million, setting the record for the all-time most expensive photo. This landscape photograph was taken by the German artist Andreas Gursky and is, to my mind, very 'ordinary'. It simply shows strips of grass and water. Yes, I know, it's subjective! (You will have to Google it as I'm not paying for the rights to use an image that I personally don't value.)

I obviously didn't tell the pupils that it was the most expensive photograph ever sold, initially, but I did ask them how much they thought it was worth. This being Barnsley, the first response I got was a very blunt, 'I wouldn't give you ten bob for it, miss.' What ensued was a very heated discussion about the merits of this photograph and the worth or value of photographs in general. It ended up with them all vowing to become photographers as there was obviously 'nowt to this photography lark' and they all fancied making some quick cash! What it showed me was that pupils are often refreshingly honest about

their likes and dislikes when it comes to photography, so any discussion is more about nurturing their own sense of style and creativity than it is about art appreciation.

I believe that photography eradicates boundaries in the sense that it is a great leveller – anyone can take a photograph. Our response to an image is up to us, but the fact remains that the individual who took the photograph is happy with it and so the response of others is immaterial.

Consider the Bill Brandt quote: 'Photography has no rules, it is not a sport. It is the result which counts, no matter how it is achieved.' How amazing is that? There are no rules and you can't get it wrong. You can be as creative as you want and it will still be *your* photograph. You can argue that there are rules – rules of composition such the rule of thirds – but these aren't rules as such; they are just guidelines – rules in name only, which are there to be broken and experimented with.

> *Be daring, be different, be impractical, be anything that will assert integrity of purpose and imaginative vision against the play-it-safers, the creatures of the commonplace, the slaves of the ordinary.*
>
> Cecil Beaton

A smartphone, iPad or camera will enable you and your pupils to utilise all of the suggestions in this book. Photography and photographic devices are creative tools that can be used every day. They are, however, *tools* to use and not an end in themselves. The aim is not to turn you or your pupils into award-winning photographers or for this book to function as a guide to f-stops and apertures. There is some basic information about cameras in Part I, which will form a handy guide as well as pointing you in the direction of more in-depth technical information, but the key focus of this book (no pun intended!) is *learning*. Learning through experimenting, discussing, refining, analysing – learning through a lens!

Photography has no rules.
It is not a sport.
It is the result which counts,
no matter how it is achieved.

Bill Brandt

The book is divided into two main sections:

- Part I: Background and basics. This includes looking at the important functions and settings of cameras, experimenting with photography, the legal position around using images in the classroom and the ethical debates around images, as well as creative ideas which are set outside of the classroom.
- Part II: Projects and applications. In this 'education friendly' section, I present projects focused around street art, miniature figures, visual literacy and challenges, and extended learning opportunities – all designed to be used in a classroom setting and to link with several areas of the curriculum. This section also includes some 'quick wins' – ideas that you could use on development days or in cross-curricular projects.

Throughout the book I have used different coloured boxes to help you navigate the content:

Overview

You will find these at the beginning of each chapter – they will outline the content covered.

Aspects covered

These also appear at the beginning of each chapter – they highlight which curriculum areas and skills are covered.

Help and advice

These provide links back to technical information or advice on how to use your camera or other device.

Tasks

These are ideas for activities linked to a specific chapter but can also be done as stand-alone tasks.

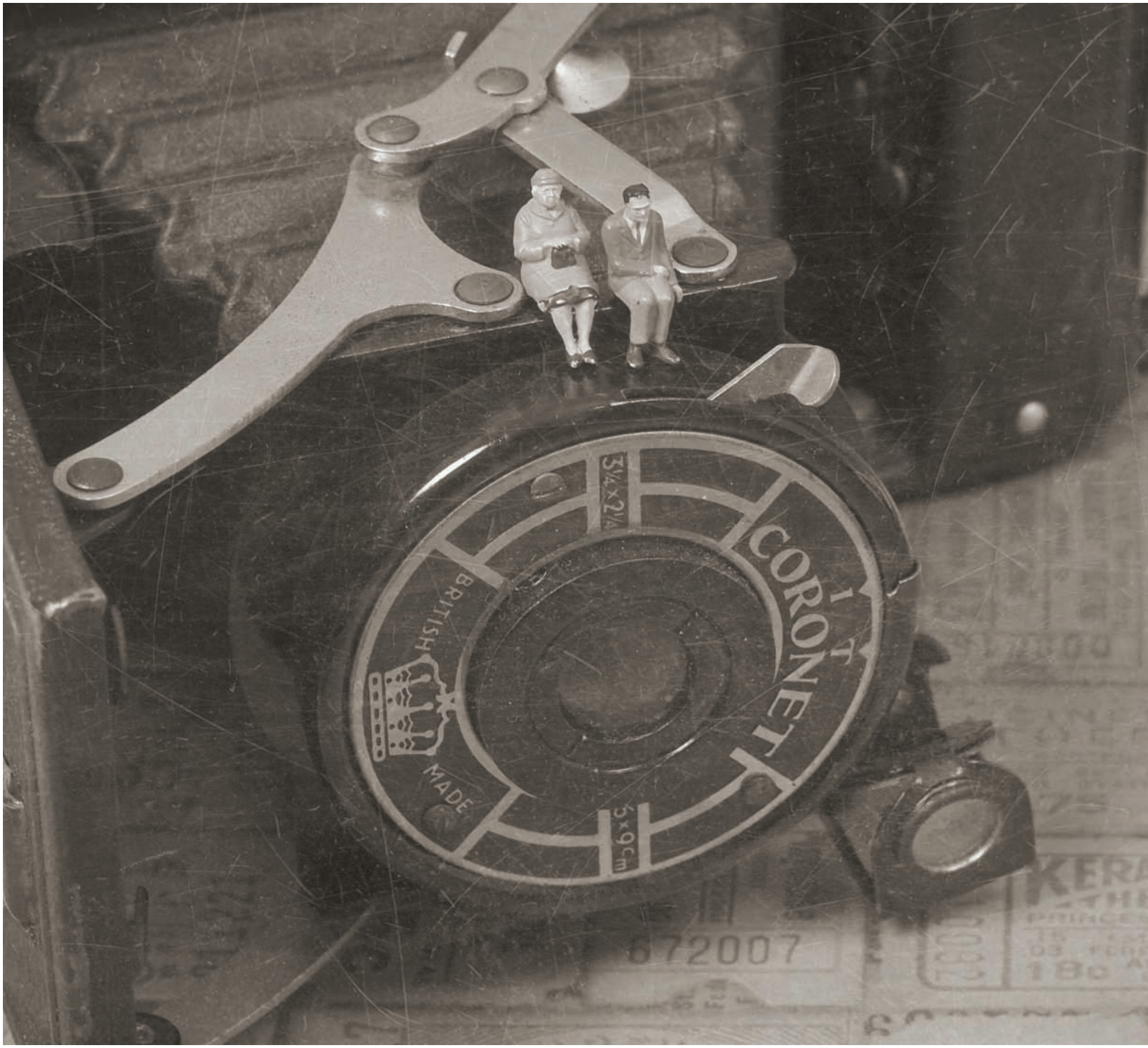
Using photography in learning is so much more than a list of what you could take photographs of. You don't need a book to suggest that you might want to take photographs of your school sports day or end-of-term production. Yes, the basic function of a camera is to take documentary images, but it can be so much more than that. If a camera is used without thought or insight, it becomes another casualty of the technological age. Similarly, an iPad won't make you a great teacher, but a great teacher can do amazing things with an iPad.

The camera itself is just a tool. Just compare the comment, 'That's a great photograph – you must have an amazing camera,' with a comparable one made at a dinner party: 'Thank you, that was a great meal – you must have an amazing oven.' Obvious really – it's the photographer who makes the photograph, not the camera.

> *A lot of photographers think that if they buy a better camera they'll be able to take better photographs. A better camera won't do a thing for you if you don't have anything in your head or in your heart.*
>
> Arnold Newman

If you speak to enthusiastic amateur photographers, some will willingly confess that they have 'all the gear but no idea', whilst others have 'no gear' to speak of but have real flair and an imaginative eye. You can find articles on the Internet about professional photographers who have challenged themselves to shoot a whole wedding using just a phone (rather them than me!), but you will also read in Chapter 5 about highly talented photographers who have used their phone to record events in war-torn areas of the world. This begs the questions: is raw talent and having an 'eye' more important than equipment? Is a workman only as good as his tools or can the craftsman create regardless of basic equipment?

The activities in this book don't need expensive equipment – but they do need passion, a sense of fun, a willingness to experiment, to learn on the job, and the ability to see more than just what's around you but to observe your surroundings deeply and with intelligence. I hope that you will be infected with the enthusiasm and passion that photography can bring to life!


CORONET
BRITISH
MADE
3¼ × 2¼
5 × 9 cm
672007

The camera doesn't make a bit of difference.
All of them can record what you are seeing.
But you have to SEE.

Ernst Haas

Part I

Background and basics

For me photography is to place head heart and eye along the same line of sight. It is a way of life.

Henri Cartier-Bresson

Overview

Getting started

Types of camera

Composition

Shutter speed, aperture, ISO and white balance

Editing software

Legal issues

Glossary

Aspects covered

Mathematics – rule of thirds/golden ratio

Science – shutter speed/ aperture

Art – composition

Chapter 1

Camera basics

Getting started

Before we even pick up a camera, it is important to think about how we 'see' and what actually makes for good composition. Consider the analogy of learning to drive a car: you wouldn't go straight out onto a busy street in your first lesson. You first need to have some understanding of the Highway Code and at least know which pedal makes you stop and which makes you go!

It is interesting that if you give an adult a camera they will often become flustered and worry about which button does what and whether they might accidentally delete something, whereas if you give a camera to younger pupils they will start snapping straightaway – their natural curiosity overcomes any practical fears and worries.

The age of the children you are working with will have a huge impact on your approach to the tasks in this book: working with 16-year-olds on an NVQ course is very different from teaching a Year 2 class. The 16-year-olds may mumble and hang back, pushing their friends forward, saying 'You do it, I'll get it wrong.' The Year 2 pupils will vie for it to be their turn and eagerly volunteer to try things out. The natural curiosity of older pupils is still there, but it is concealed under a veneer of self-doubt and embarrassment. We need to be aware that the fear of looking stupid and of appearing over-keen can dominate their approach.

These ideas may appear to contradict themselves but in fact we need both elements: sometimes we need to just play and accept serendipity – Horace Walpole's 'faculty of making fortunate discoveries by accident', whereas on other occasions we may be looking to create a specific feel or effect and so will need to have the technical know-how to achieve it.

A good way to start thinking about what we can actually see is to use a cardboard viewing frame. You can make your own or pick them up cheaply at a DIY store. Ask pupils to use these in order to become better aware of what they can see when framing an image. They need to learn to think in rectangles! Walk around the classroom, the school, outside, look up, down, close up, far away … This will help with basic composition and make them think before pressing the shutter.

Composition

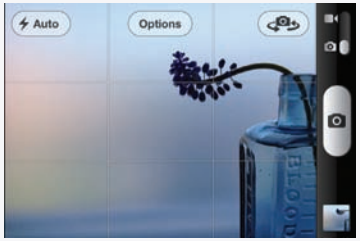
There are various compositional devices which can be explored and exploited. Some have mathematical concepts behind them, some are creative and others are simply common sense.

Rule of thirds

The first idea to think about in terms of composition is the 'rule of thirds'. Before we go any further, though, it is important to point out that these compositional 'rules' are just guidelines – and that sometimes rules are made to be broken!

Imagine placing a grid of lines over your image to divide it into nine equal spaces. An image is most pleasing to the viewer if the main points of interest are placed at the intersections of these lines. It's a mathematical rule – literally dividing the image into thirds. Most cameras and phones have the facility to display this grid on your screen to help you when composing your photographs. In order to activate the point of focus on a phone, you usually need to tap the screen wherever you want the point of focus to be, otherwise your phone will automatically focus on the centre of your image.

To take a screen shot (such as the image below) on an iPhone or iPad, click the on/off button followed by the main circular button at the bottom of the device.



If you wish to focus on different parts of your screen/image there are two main options:

1. Focus on your primary subject and hold the shutter halfway down – this will lock the focus. You can then recompose using the rule of thirds and place your main object to one side – then press the shutter and take the photograph. Your image will then be pleasingly composed as well as having your main object in focus.
2. If you are using a digital camera which allows for this, you can set the point of focus using your menu buttons.

Other ideas that can be used to improve your composition include:

- Leading lines – these are basically anything that 'leads' your eye into the photograph. It could be a road, a fence, a line of trees, etc.
- Perspective – remember that you don't always have to look straight at your subject. In its most basic form, do you want a landscape or portrait shot? Try both and see which is the most pleasing. Think about taking shots looking upwards or downwards as it is possible to distort your image and get a completely different effect, or try some 'forced perspective' images.

See Chapter 13: Quick wins
Perspective and forced perspective

- Lighting – do you have enough light to take your photographs? Do you want natural light or do you need spotlights and torches to add light to specific areas in your image?
- Backgrounds – there is nothing worse than concentrating really hard on your subject only to later notice something in the background of the photograph which ruins the image. The photographer Ernest Haas said that the best wide-angled lens is 'two steps backwards'. Walk around before you take your image – are you in the best position? If you wish, pupils can create their own backdrops by drawing scenes or buildings onto long rolls of paper. You can also purchase ready-made backdrops but these tend to be expensive.

You cannot depend on your eyes when your imagination is out of focus.

Mark Twain

Types of camera

- DSLR – these are advanced and have interchangeable lenses, but can be expensive. If you intend to take up photography as a serious hobby then it is worth investing in a DSLR. The range on offer is literally mind-boggling and you could read reviews for weeks before making a decision. My advice would be to opt for one of the major manufacturers (e.g. Canon, Nikon, Pentax, Samsung). They all have entry level DSLRs which, although expensive, will not break the bank. This will give you chance to practise and to purchase specialised lenses, such as fish-eye, zoom or prime, at a later date.
- Bridge – these are cameras which literally bridge the gap between a DSLR and compact camera. Most are comparable in size to a small DSLR but do not have interchangeable lenses. There are a huge variety of these cameras and their specification will vary depending on the manufacturer and the cost.
- Compact – these are small, light, easy to use and fairly cheap. It would be unrealistic to try and give advice on the literally thousands of models and makes available. These are ideal to keep in your pocket or bag so that you have a camera with you at all times. The low cost of these means they are more likely to be within a school's budget.
- Toy – these are specialist retro cameras (e.g. Lomo Plastic), which use special effects to create stylised images. You can also create toy camera effects by using an iPad and 'toy camera' apps.
- Polaroid – these are now being reintroduced. However, you can also use an iPad and Polaroid apps (see Chapter 4).
- iPhone/iPad – these devices have in-built cameras which can produce reasonable quality images. Apps such as KitCam can give you more control.

Whatever camera you are using, the principles will still be the same. The buttons and dials, however, are another matter – they will be all over the place! However, once you know what you are looking for, a quick look at the camera handbook should show you where to find the correct controls.

As a beginner, you can use your camera in automatic mode, which means that the camera will work out all the settings for you. In some cameras this is a 'P' on the dial, in others a green rectangle. P stands for programmed automatic. If you press your shutter halfway, you will be able to see what shutter speed and aperture your camera thinks is best for a particular shot. This can really help when you first start to use the camera in manual mode as it gives you a useful starting point. In P mode, you can decide on settings such as flash, ISO and white balance (although you can also leave these on automatic), so it's a halfway house between being fully automatic and you deciding upon settings manually.

There are five key aspects that will allow you to take control of your images: shutter speed, aperture, ISO, white balance and metering. Each of these will have an impact upon how your photograph turns out. The effect that you are aiming for will determine which of them takes priority. For example, if you want to freeze the action of a sporting event or wildlife in motion, then you will need a fast shutter speed. If you want your subject in focus and the background blurred then you will be led by the aperture settings.

Auto	Sets everything for you
P	Sets shutter speed and aperture
TV	Shutter speed (you set this, camera then sets aperture)
AV	Aperture (you set this, camera then sets shutter speed)
M	Manual (you set everything)
SCN	Scenes (for particular settings e.g landscape, candle light,etc)

Shutter speed

By taking control of your shutter speed, you can decide what sort of shot you want to take. The higher the number, the faster the shutter speed – for example, 1/200 is one two-hundredths of a second whereas ¼ is a quarter of a second. With a fast shutter speed you can freeze action, and with a slow shutter speed you can create the feeling of movement. Assuming that most people using this book will be shooting with compact cameras or kit lenses, a very general rule of thumb is that you can only shoot hand-held (i.e. without a tripod) at no lower than 1/50 of a second.

If you wish to delve further into shutter speeds, there are hundreds of books dedicated solely to explaining how it can affect your photographs (a good example is *Understanding Shutter Speed* by Bryan Peterson[1]).

Shutter speed experiment

Choose a subject – preferably a static one – and set your ISO (this sets the camera's sensitivity to light – see below) to a fixed amount. If you are inside, set it at 400 and if you are outside set it at 100.

Take several images but each time reduce your shutter speed. So, begin by taking a shot at 1/400, then 1/250, 1/100, 1/80, 1/50, 1/25, 1/15 and 1/4. You will see the numbers change to 0"3, 1", 1"3, etc. which means 0.3 seconds, 1 second, etc.

Print off the images or look at them on your computer – what conclusions can you draw? Which images are darker? Which images are clearer? At what point did your images become blurred?

Next, take two images of water running from a tap. Take one at 1/15 (use a tripod or rest your camera on something) and one at 1/400 – look at the difference in the images.

1 B. Peterson, *Understanding Shutter Speed: Creative Action and Low-Light Photography Beyond 1/125 Second* (New York: Amphoto, 2008).

Aperture

The aperture setting allows you to determine how much of your image is in focus. Do you want the whole of your image sharp or do you want the main subject (e.g. a person or flower) in focus and the background blurred? This is referred to as depth of focus or depth of field.

By opening the aperture to its highest setting (e.g. f2 or f1.4), you will let in a lot of light but only focus on a small amount of your image. By using a small aperture (e.g. f16 or f22), you will not let in much light but all of your image will be in focus.

The 'f' number is the aperture – f16 is a small aperture and f2 is a large aperture.

An easy way to remember (even if it's not technically correct) is:

The smaller the number the less of the image will be in focus – but the actual aperture will be wide open so there is lots of light.

Low number Less in focus Lots of Light

ISO

The ISO button or setting controls the sensitivity to light. If you use a setting of ISO 100 then your image will be sharp and not have any grain (often called 'noise'); however, you need a lot of light for this to work or your image will look dark. Modern cameras can have ISO settings as high as 3200, which will let you take an image without flash in a dark setting, but you will get a very grainy result. Most cameras have an 'auto' setting, so until you are more confident, it is best to leave this as your default setting.

White balance

White balance sets the colour cast for your images – you will have settings for sunny, cloudy, indoors and so on (all with obvious icons of a sun, a cloud, etc.). As with your ISO settings, you can leave this on auto until you become more confident with your camera.

Metering

Metering allows your camera to work out how much light is available – the exposure. If you 'spot meter' it will take a reading from one place (e.g. a person's face) or you can take an overall reading based on however many focus points your camera setting allows, and the camera will give you an 'average' setting.

Additional resources

It may be worth investing in some further resources to develop your work. The following are merely suggestions and are not essential.

- Tripod – if you buy just one extra item, I would recommend a tripod. This will allow you to work on creative images using the shutter-speed setting which will enable you to take photographs in situations where you don't have a great deal of light. It doesn't have to be a really expensive one – if you are using compact cameras you can pick up a mini tripod for a few pounds.
- Card readers or extra camera leads – a card reader will allow you to download photographs from the card in any camera. Prices for these start at £2.99 so they're good value.
- Memory cards – it is helpful to have a couple of spares. Prices vary according to the type of card.

- Storage boxes/cases – to keep cameras safe from knocks and dust.
- Prop box – develop your own by collecting mirrors, hats, fabric, magnifying glass, jam jars, old CDs, pipettes, plasticine – anything which might be useful.

It is worth pointing out that all cameras will come with a manual, often with online support to help you get started. Sites such as www.photojojo.com also have a wealth of information and exciting projects which are designed specifically for smartphones. The website www.digitalcameraworld.com is in magazine format and offers advice, tips, projects and often free downloads of borders or textures that you can use to embellish your photographs.

Editing software

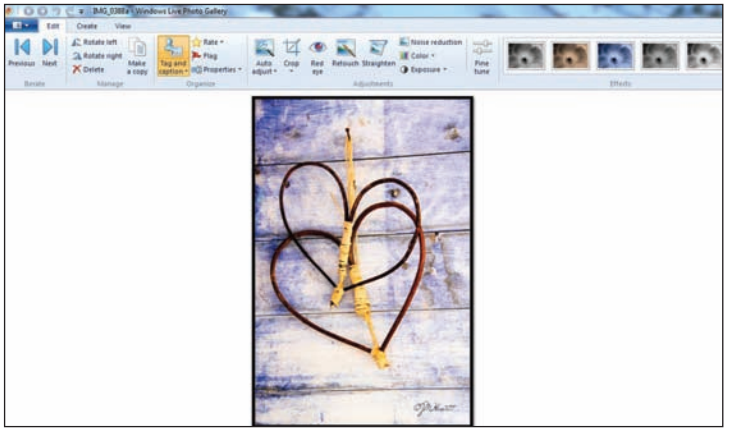
Once you have taken your images and transferred them to your computer, it is a good idea to back them up onto an external hard drive or CD – it is often impossible to recreate an image if your computer crashes.

There are many photo editing software packages available. Obviously, cost is a factor: while packages such as Photoshop and

www.photfunia.com

Lightroom are excellent, they are expensive and require training. However, Photoshop Elements is available for under £100.

Windows has some in-built editing functions – if you open an image and then click on the edit tab (in the top left-hand corner), this will open a new window and allow you to carry out some basic edits, such as rotating, cropping, straightening and changing the tones.



There are a number of free online sites which enable pupils to edit and have fun. For example, www.photofunia.com allows you to place your photograph into different 'settings', such as bill boards, magazine front covers and artist's boards. It is very easy to use and pupils will pick it up almost immediately. This is a good website to use if you have a 'Pupil of the Week' board or page on your blog, as it adds a fun dimension and pupils can then take a copy home as an unusual form of certificate.

Legal issues – an overview

The debate around where it is acceptable to take photographs is a complex one but, as a school, you obviously need to decide what constitutes 'responsible policy'. My advice would be that if your photographs are for curriculum-based work, and are being shared just within the school, then your standard waiver is sufficient. However, I would strongly encourage senior leadership teams to involve parents and governors in what teachers are doing – opposition often comes from lack of understanding. In the same way that you have a policy on the responsible use of ICT, which explains the importance of Internet access, Skype, blogging and so on, then explaining why the use of photography supports teachers' practice will hopefully avoid any misunderstandings.

Many school policies in these areas are almost apologetic in tone: they quote the Data Protection Act and are very jargon based. Obviously, the Data Protection Act is important and every school should strive to protect their pupils' rights. However, schools don't send out letters informing parents that pupils will be using chemicals in a science lesson, which could be dangerous if used incorrectly, or that knives could be an issue in food technology lessons, so why would we need one for photography?

However, if you do decide to contact parents, it is important to adopt a positive tone and stress the importance of pupils' learning, with a proviso that obviously the safety and well-being of the pupils is paramount.

A starting point could be:

> *At _____ School we value and celebrate the work of our pupils and want to be able to showcase this. We know that you enjoy sharing in our celebrations and we would like to share our day-to-day work with you.*
>
> *We will be using images created by the pupils themselves in our displays and also via our blogs and website. We are proud of our pupils and their achievements and using photography is a way of allowing us to publicise this. Obviously, we will ensure that sensible and caring protocols will be in place around the use of photographs.*
>
> *We would love you to look at our work, to comment and share. If you have any questions, please feel free to contact us – we would welcome the opportunity to share our ideas with you.*
>
> *Could you please sign below to show that you support us in our work and are happy for your child to take photographs and also to be featured in photographs.*

You are celebrating your pupils' achievements, after all, so there should be no need for you to go into great detail about where images will be stored or about not adding personal details to images. This should all be part of your school ethos: parents should be aware that pupil safety is key, so itemised policies are not what they want or need.

It could be a worthwhile exercise to ask pupils to create this 'policy' and for them to be the ones to illustrate it for parents. Pupils' photographs could be included in the policy letter as examples of good practice so parents can see the policy in action.

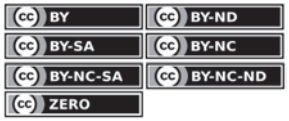
Can I use images that belong to other people?

The copyright of any image belongs to the photographer and you may not use that image or alter it in any way without the photographer's permission. Many teachers do not seem to be aware of this – how often have you seen a presentation which includes an image with a copyright watermark embedded across the middle? This is breaking the law – not to mention how unprofessional it looks. You may have also been at presentations where the image used has been enlarged and become pixelated – thus rendering it worthless. The photographer will have uploaded a small image file to the Internet precisely to stop people from using their work without permission.

So, how can you find amazing images that you *can* use in your lessons or presentations legally? It is easier than you think and you will be surprised at the quality and wealth of materials that are available. Any media that is marked as having a Creative Commons licence is useable in education.

First, you need to understand the concept behind the Creative Commons. There are six basic types of licence. Some will allow you to use, alter and redistribute the image, even for commercial purposes. For example, the image below is licensed under CC-BY-3.0

If you are only using the images within the classroom, and simply using them, rather than editing or Photoshopping them, you can basically use any image that is marked as 'for use' under a Creative Commons licence. Here are some of the different types of image you may encounter:



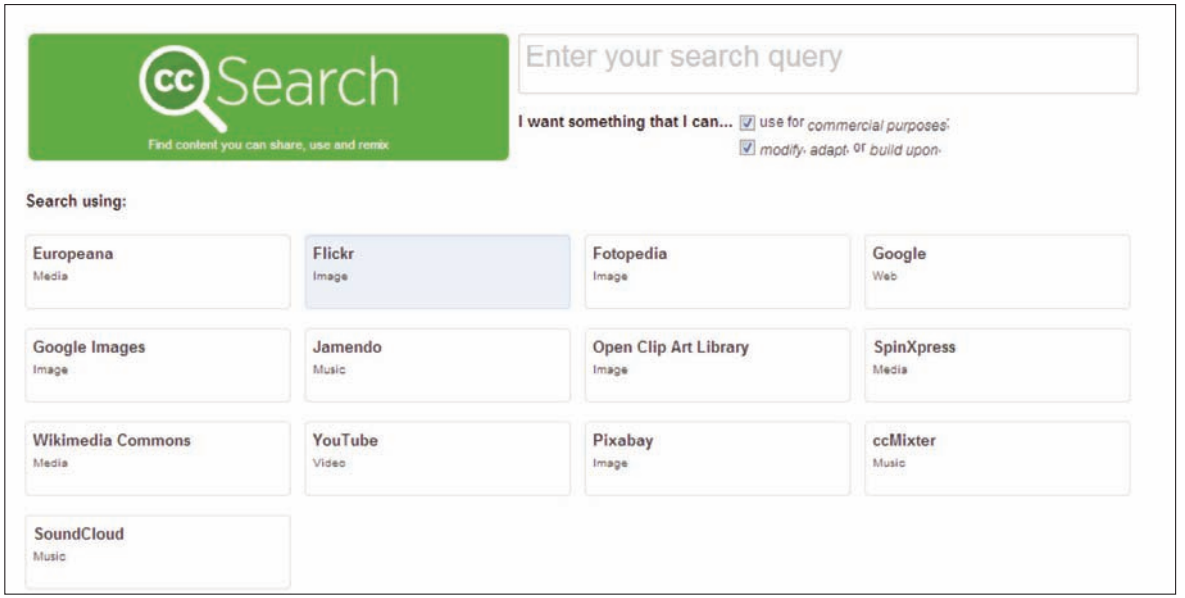
CC-BY	Creative Commons – BY If you use this type of image you must attribute it. This means that you must say who took the photograph and who it belongs to. BY applies to all of the licences. There are no other restrictions so you can build on the image, change it and even use it in a commercial project.
CC-BY-SA	Creative Commons – BY-ShareAlike This is exactly the same as CC-BY, but if you change the photograph you must license this 'new image' in the same way as the original, i.e. ShareAlike.
CC-BY-ND	Creative Commons – BY-No Derivatives You can use this image in any way you like as long as you attribute it and do not make any changes.
CC-BY-NC	The same as CC-BY but you cannot use the image for commercial purposes.
CC-BY-NC-SA	The same as CC-BY-SA but you cannot use the image for commercial purposes.
CC-BY-NC-ND	The same as CC-BY-ND but you cannot use the image for commercial purposes.

You will probably never need to refer to this table, unless you decide to publish work that you have created from other images.

To make it really easy to find images without checking individual licences, you can use the search facility at http://search.creativecommons.org/ which allows you to search for the sort of licence you need. For example, the image below is licensed under CC-BY-3.0.

If you just want images or videos for classroom usage, simply untick the two boxes at the top and type in your key word – try Fotopedia to begin with as these tend to be images from semi-professional or professional photographers who are willing to share their work.

If you want to check out the quality of the images available, go to Fotopedia and, as a starting point, look at the amazing images provided by NASA. However, be warned: this has a tendency to become addictive and you could lose several hours of your time before you realise it!



Camera basics glossary

Key word	Definition
Aperture	How wide the shutter is open. This can alter how much of your image is in focus. This is shown as 'f' numbers – f16 is a small aperture and f2 is a large aperture.
Auto mode	Setting which means that everything is 'set' for you – the equivalent of point and press.
Bridge camera	A bridge between a compact camera and a DSLR – it has some of the advantages of a DSLR but is often less expensive.
Card reader	Device which allows you to transfer photographs from your camera's memory card to your computer.
Compact camera	Small lightweight cameras with an in-built lens and no additional lenses.
DSLR	Digital single lens reflex camera – it has interchangeable lenses and can be expensive. For the more experienced photographer.

Key word	Definition
Forced perspective	A technique to alter the way we see a person or object (e.g. by placing them in the distance to create optical illusions).
ISO	Light sensitivity
Leading lines	Lines which lead your eye into a photograph (e.g. a winding road or a row of trees).
Manual	You decide upon all the settings – aperture, shutter speed, white balance, ISO and metering.
Memory card	Storage device inside your camera (the digital equivalent to film). Available in different formats (e.g. CompactFlash, Secure Digital) depending on the make of camera. Remember to 'format' this occasionally when in your camera as this will clear the card completely and keep it from becoming cluttered.
Metering	This allows you to set for light in different parts of your image – you can use spot metering, centre weighted or evaluative meter settings.

Key word	Definition
Perspective	The way you look at something – the angle or viewpoint from which you take your photograph.
Polaroid	Camera (or app) where the photograph is printed instantly.
Rule of thirds	A compositional device where you divide your image into three both horizontally and vertically. The points of interest would be placed where the lines cross.
Shutter speed	The amount of time the shutter stays open. Setting button 'S' or TV (Canon). A fast shutter speed will freeze action but allow in less light. A slow shutter speed will blur motion (but will require a tripod).
Toy cameras	Retro cameras (often plastic) which all have differing special effects, such as colour leaks.
White balance	This affects the colour cast of your photograph. Settings such as 'sunlight' or 'cloudy' will help to capture true colours.

The painter constructs, the photographer discloses.

Susan Sontag

Overview

Soap film/bubble images

Experimenting with paint

Bokeh

CDs and water droplets

Aspects covered

Science – light/strength of solutions

DT – incorporating designs into objects

Music and science – what does music look like (using paint and speakers)

Chapter 2

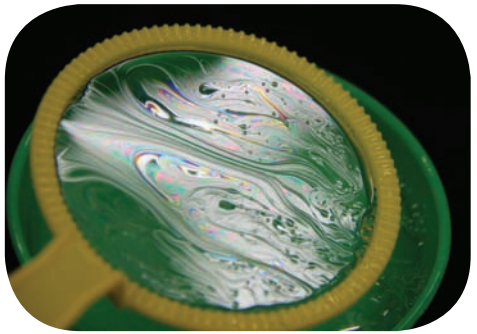
Experimental photography

The beauty of experimental photography is that you can't get it wrong. It's abstract, it's conceptual, it's basically playing! Some results have more of a wow factor than others, but because it is all subjective, it is very low stress. It is also often messy so protective clothing may be a good idea for some of these activities.

Soap film/bubble images

Ingredients

- 1 bottle of bubble solution (you can buy this from any toy store or supermarket) or make your own using washing-up liquid – it will need to be a concentrated solution
- 1 bottle of glycerine (this is used in baking so you should find it in supermarkets)
- 1 bubble wand – or one wire coat hanger bent into a loop
- 1 flat-bottomed container
- 1 dark background – black paper or a black towel
- Natural sunlight or a torch



Method

- Mix the bubble solution with a teaspoon of glycerine (this helps the soap solution to stay on the loop for longer) in the flat-bottomed container.
- Dip the bubble wand into the solution then shake it until it is covered in a film. Lift gently and hold still – the solution will begin to 'settle' and colours will start to appear.
- By tilting the wand slightly, into the light or away from the light, you will get different effects and colours.
- You can vary the effects by the amount of light, the position of the wand and the angle of the camera.
- If the solution seems fairly strong (you can always add more glycerine) you can blow on it slightly – this will cause a different effect.

Variations

- Try making different shaped wands using wire coat hangers or pipe cleaners – can you make a square bubble? Can you design a pyramid shape? How does it affect the colours and patterns? You could use this as the basis of a science experiment and look at the different types and strengths of bubble solution as well as the shapes and sizes of the wands.
- Try blowing on the bubbles to which glycerine has been added and photograph them as they float.
- Set your camera to a fast shutter speed in continuous shooting mode and capture the bubble as it bursts.

See Chapter 1: Camera basics
Using shutter speed

If your camera has manual focus, it might be better to use this – otherwise the camera may focus on the loop itself and not the bubble solution.

- Buy or make a huge bubble wand – take this outside as it tends to get messy. Pupils will have to factor in weather conditions when they take their photographs, especially wind speed and direction.
- Aim to take a photograph of a whole bubble showing the reflections in it. This will involve thinking carefully about where to take the image and what will be reflected in the bubble. The example on page 40 was taken in an enclosed area with glass bricks which caused wonderful colours and shapes. You can also see the reflection of the group of photographers.

Editing

- Crop a section of your image so that you are left with just the pattern (i.e. cut out the loop) – you can use any photo editing software to do this (see Chapter 1).
- Edit the image by over-saturating the colours in Photoshop or another editing program such as Snapseed (see Chapter 4).
- When you have found an image that you like, use it to create a design for an object that could be sold, such as a mug, t-shirt or card.
- Send your image to one of the poster sites on the Internet and have a huge one printed for your classroom wall.
- Put your best images into a slideshow to be used as wallpaper or screensavers for your class computers.

See Chapter 1: Camera basics
Editing software

See Chapter 4: iPhoneography and apps
Apps

Experimenting with paint

Martin Klimas is a German artist who wanted to find out what 'music looked like'. He achieved this in an amazing series of images. He set up a speaker with a Perspex sheet on top covered with different coloured paints – then turned up the volume. The photographed results were stunning.

Look at the images in the Telegraph picture gallery.[1] Play the tracks Klimas used and ask the pupils which image they think are which songs. Perhaps you could have a joint art/music/science/photography project to recreate these images.

Hindu festival of Holi

Holi is a religious festival which celebrates good overcoming evil and the arrival of spring. It is a vibrant and colourful celebration which involves much throwing of powdered paint – there are some amazing images on the Creative Commons website. I've always wanted to get a group of pupils dressed in white in an open space with a white canvas or sheet on the floor and allow them to throw paint while other pupils and myself photograph them. Alas, I have not yet been that brave – but if you are, send me some images!

See Chapter 1: Camera basics
Can I use images that belong to other people?

1 See <http://www.telegraph.co.uk/culture/culturepicturegalleries/9113526/Photos-of-paint-splashes-in-mid-air-by-Martin-Klimas-show-what-music-looks-like.html/>.

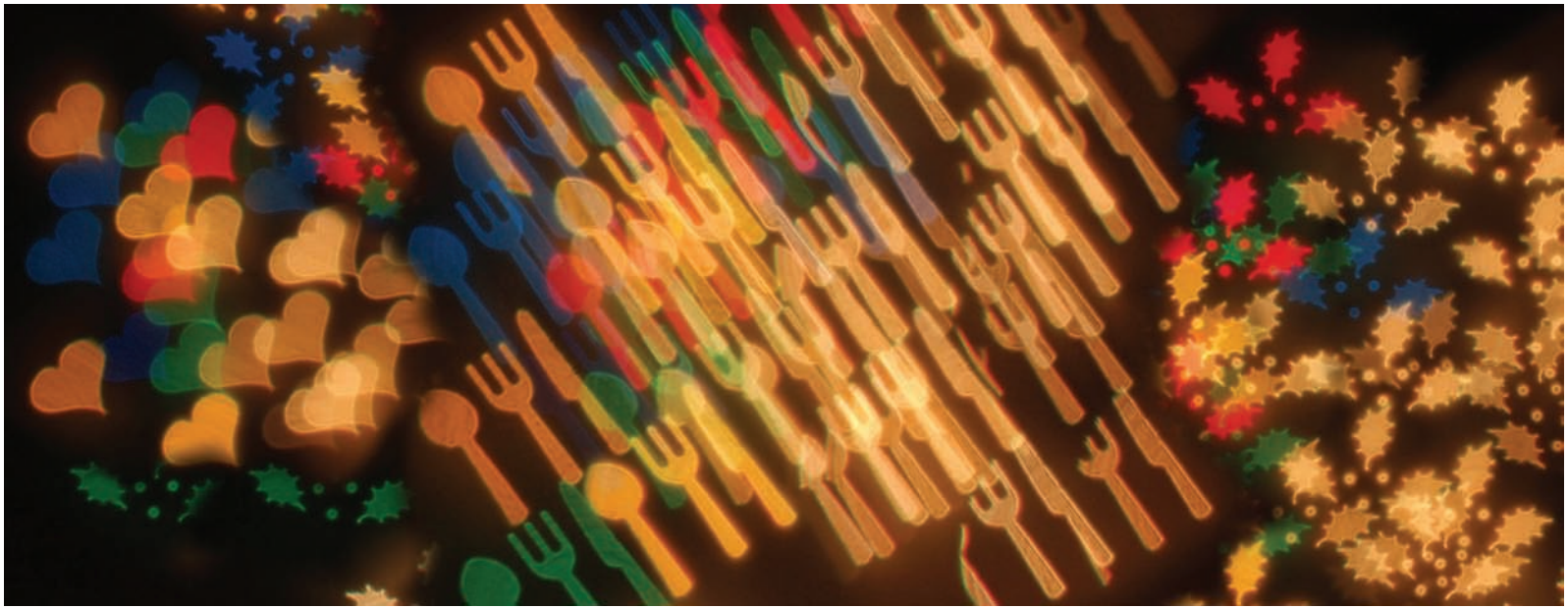
Bokeh

Bokeh is a Japanese term for the out-of-focus areas in a photograph. It comes from the Japanese word 'boke' which means haze. It often manifests as circles of light in the background of an image. It is a pleasing and deliberate blur rather than just an out-of-focus photograph.

Bokeh is created by using an aperture setting of f1.4 or f2.8, which allows the main part of the image to be in focus whilst the background is blurred and out of focus.

See Chapter 1: Camera basics
Aperture and depth of focus

You can experiment with different filters which will turn lights into shapes. You would normally need a filter kit and an expensive fast lens with the ability to take photographs at a wide aperture, as in the image on the left. However, there is a way to create your own Bokeh images without spending a great deal of money (although ideally you need a DSLR camera which allows for manual focus).



Ingredients

- DSLR camera with manual focus
- Fairy lights – you can buy these from supermarkets for less than £2 at the right time of year
- Thin black card or paper
- Decorative hole punches *or* a craft knife and clip art shapes
- Rubber bands or masking tape
- A darkened room (all teachers should have one of these to lie down in occasionally!)

You can create your own bokeh filters either by cutting shapes into black card or working with your DT department and using laser cutters.[2]

See Chapter 1: Camera basics
Shutter speed
ISO
Additional resources

2 See <http://www.diyphotography.net/diy_create_your_own_bokeh/>.

Method

- Create your filter from a hole punch and black card.
- Cut the card into a circle which is 5 cm bigger than your lens.
- Place the card in front of the lens and carefully secure with a rubber band or masking tape.
- Tape the fairy lights to a plain wall in a random fashion but not too far apart.
- Set up your camera – if you have a tripod, you can set the camera to a shutter speed which will allow in enough light. You will need to experiment, depending on how much light there is in the room.
- Set your focus to manual (it will be set as auto as default) – the switch is usually on the lens itself.
- Focus on the lights – by moving the lens and yourself you will eventually find the 'spot' where your lights are focused and actually become the shape that you have created from your black card. You may need to move around and experiment with the distance between you and the lights.
- You can then edit images into collages or cards.

CDs and water droplets

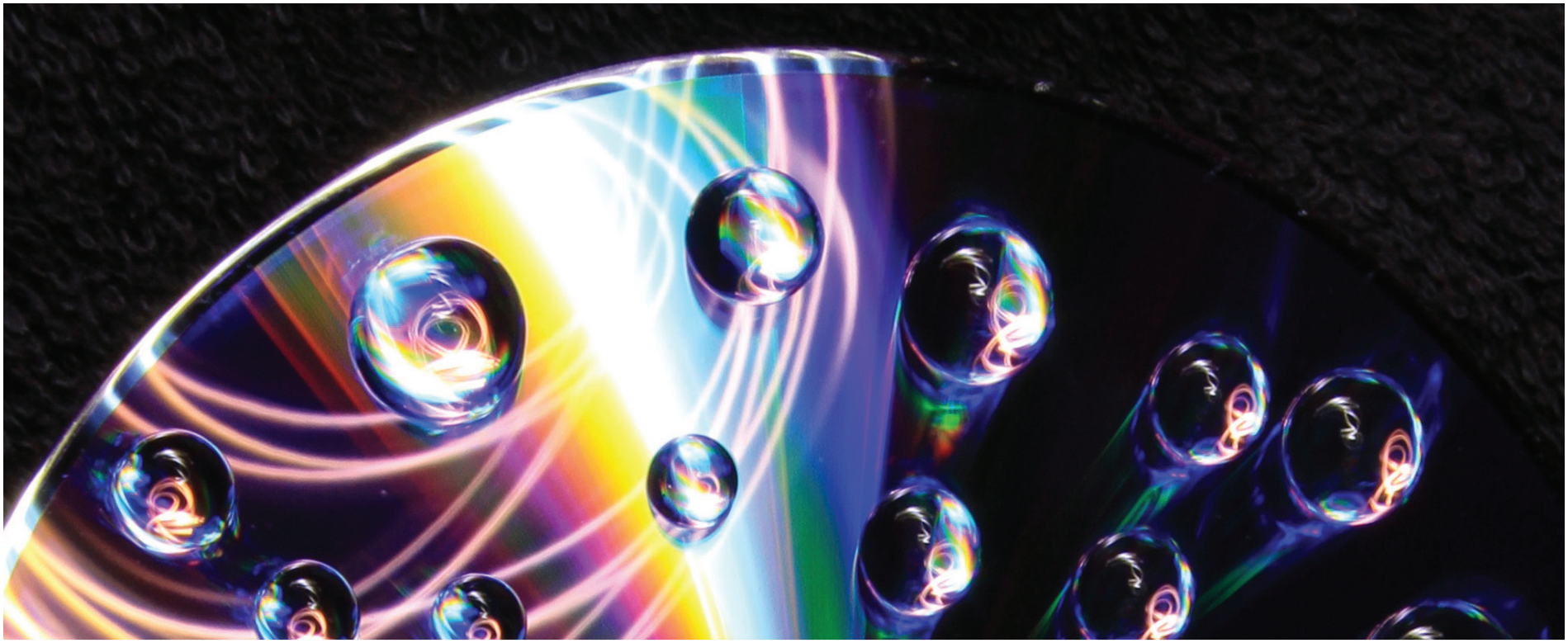
If you hold a CD up to the light and move it around you will get some amazing rainbow streaks of light. By working in pairs, pupils can tilt the CD into the light to achieve some simple but very effective photographs. If you drop water droplets onto the CD using a pipette or a straw, it is then possible to see images of the light reflected in the water drops.[3]

If you want to take it even further, you can create the image in a fairly dark space and shine a torch over the CD – this will produce light streaks, bubbles with light reflected in them and trails of light from the torch!

Create tutorials for bokeh, soap bubbles or CD and water droplets using a mixture of text, images and video.

You could use apps such as Explain Everything or Creative Book Builder.

3 For some examples see <http://photoextremist.com/how-to-take-psychedelic-photos-of-cds/>.



For me the camera is a sketchbook, an instrument of intuition and spontaneity.

Henri Cartier-Bresson

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Jane Hewitt taught, mainly at secondary level, for 30 years. She still loves learning, discovering new ideas and photography and is rarely found without a camera around her neck.

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