Software specification for *iMedia Unit 1 Digital Graphics = **Serif PhotoPlus***

1 Use digital sourcing hardware to obtain bitmap digital graphics material

1a *Use digital sourcing hardware to obtain source graphics*

Digital Cameras

Fact file 1 – Ten golden rules of photography

It doesn't matter whether you're using the most basic disposable point-and-shoot camera or state-of-the-art professional kit, and whether your camera is digital or film, a good photograph is made even before you release the shutter button, through the eyes of the photographer. There are only three key words to remember: composition, composition, composition! Are you really seeing what the camera will record? Here are some top tips to get better shots.

1. **Landscape or portrait format?**
   Don't forget that you can turn your camera around; it doesn't always have to be held horizontally. Try the same shot both ways. The terms are now familiar even to non-photographers because they are used to describe the orientation of documents in ICT and they are self-explanatory. However, don't think that all portraits have to be portrait format and all landscapes landscape. Use your photographer's eyes.


© David Milner

2. Viewpoint

Not every photo has to be taken at your eye level. Stay safe, but think of different angles to shoot from: crouch down and your subject will look more powerful and dominant; get on a chair or up some steps and look down at your subject - it will seem more vulnerable and defenceless; an even higher viewpoint will give a dramatic bird's eye view. What's your message? The viewpoint can help you get it across. The familiar landmark of St Paul's Cathedral is given fresh impact with a low viewpoint. The high viewpoint makes the sheer scale of the Louise Bourgeois sculpture very evident, as the figures seem so insignificant in comparison.


© RKM
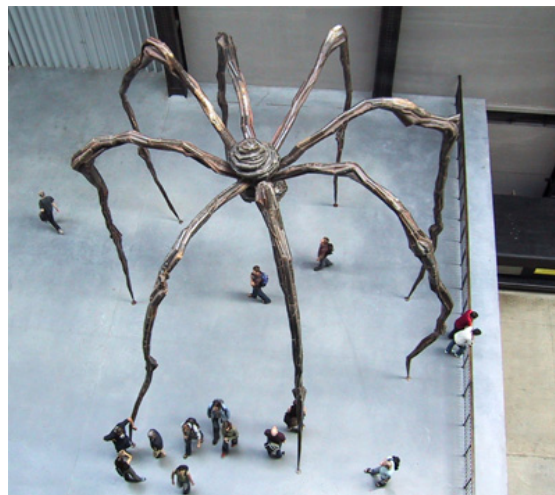
© RKM

3. Rule of thirds

Photos where the main subject is dead centre are boring. Placing the subject off-centre makes the composition more dynamic. Artists and photographers often use an imaginary grid to compose their pictures– they mentally divide the scene into thirds along horizontal and vertical lines and avoid putting the main interest into the middle square. This called the rule of thirds. Of course, deliberately choosing to break the rule by moving the subject to one of the top corners, for example, introduces an element of surprise that can make your picture more memorable.


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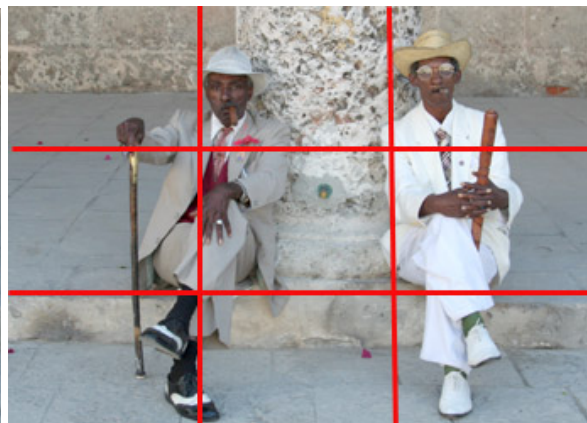
4. Lines

Strong diagonal lines and repeated or contrasting shapes are powerful elements in a shot that can give dramatic effect to a composition and draw the eye in. They emphasise perspective and give depth to the view. The diagonals of the kerb and the double yellow lines converge towards an invisible vanishing point and lead the eye in towards the baby's face in the photo below.
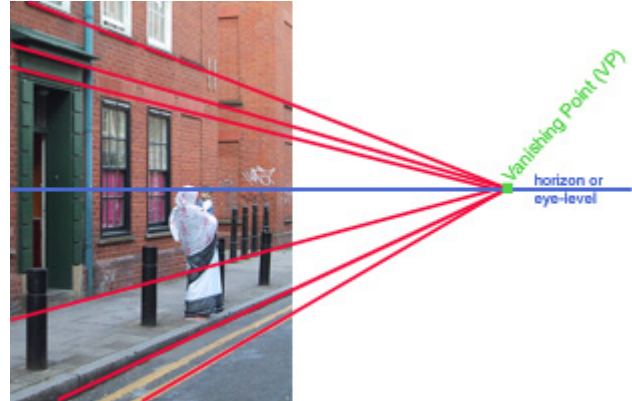
© RKM

5. Framing

Add visual interest to routine shots by using something in the foreground to create a frame around the subject. This may be on one side only, it doesn't have to be all round. This is another device photographers use to create a sense of depth in their pictures, especially with landscape shots. By shifting your viewpoint slightly, you may be able to use a windows, doorway, arch or foliage as a convenient frame. The view of the Welsh wind farm is framed by a car wreck. The mountain biker is framed by tree trunks.

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6. The tree-growing-from-head syndrome

A common fault with otherwise good pictures is that you just don't notice what's there because you're so focused on the main centre of interest. Double check the edges of the frame and make sure nothing appears to be growing from your subject's head (unless you are deliberately doing surreal trick photography). Just shift your position slightly, or ask your subject to move a little. The cross behind the girl's head in the photo of the French cemetery was airbrushed out later. A cluttered, distracting background can be avoided by finding a higher viewpoint or changing position.

© RKM

7. Get in close

Another common fault that amateur photographers make is to have lots of unimportant background filling the frame, especially with portraits. Get in CLOSE and encourage your subject to look directly into the lens. If you ask them to look away and call them to turn their head just at the last moment, you will avoid frozen, stiff poses and unnatural fixed smiles. On the other hand, it is sometimes important to establish location by including enough background detail. Although the toddler in the picture on the left fills the frame, the closer shot is more arresting and still shows the context. He isn't looking into the lens, but the image captures a pensive moment when he's totally absorbed he is in what he's watching.

© RKM

8. **Shutter lag**

One disadvantage of digital fixed lens cameras is the significant time lag between the moment you press the shutter button and the moment the image is captured. With moving subjects you have to think ahead, or you'll miss the shot - so anticipate and press just before the moment you want. Take lots of shots to make sure you capture the perfect moment. The advantage is that it's easy to preview and delete unwanted images and you haven't wasted any film! The photographer tracked the mountain biker through his viewfinder before taking the shot below, standing still but moving his camera with the subject: this is called panning and is not only a technique used in shooting movies. The rider is in focus, but the trees behind are blurred. This gives a sense of movement. Notice the composition too – his head is in the top third of the frame and the ground below the wheels gives a sense of the height of the jump.

© Danny Milner

9. **Tune in to colour**

Colour is not just something artists and graphic designers are tuned into – photographers use it as a tool too. With many photos colour is just something that's there – you don't take it into account. But it can be one of the key elements of the composition. Colours react together in one of three ways: they clash violently, they contrast dramatically or they harmonise. Based on an artist's colour wheel these are called complementary colours like purple and yellow; contrasting colours like purple and orange; or harmonious (or analogous) colours like blue and green.

Complementary colours are opposite eachother.

Contrasting colours are 4 shades away

Harmonious colours are 2 steps away

How do the main colours react in these photos – the turquoise of the door with the magenta flowers, the red of the Chevy and the flag with the green of the palm tree and grass?

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10. Don't move

Finally, hold the camera steady with your feet slightly astride and your elbows against your body. When you press the shutter button, breathe in, hold your breath and press down smoothly and gently, don't jog the camera.

Experiment and have fun keeping the rules and breaking them all, but think before you shoot and, above all, learn to really SEE.

Activity 1

To see how these rules have been successfully applied (or broken) by some famous photographers, visit the website of the National Museum of Photography, Film & Television in Bradford: http://www.nmpft.org.uk/photography/

Choose one photo that you really like. Copy it to a Word document for your digital sketchbook, or use the prepared worksheet in the Extras section. Make a note of the photographer's name and the title of the picture if it has one. Copy and paste the URL of the page where you found it and note the date you accessed the site. Write two or three sentences to describe the subject matter of the photo, its composition and why you like it. Does it follow one of the golden rules? Save the file as *1Aphoto_choiceXXX* (replace XXX with your own initials or naming convention agreed by your ICT teacher).

Fact file 2a

Different types of camera: fixed lens

It is important to understand the basic difference between two main camera types: fixed lens and single-lens reflex.

Fixed lens or ***compact cameras*** can be digital or film and, as the name suggests, their lens cannot be removed. They are also called ***point-and-shoots*** or ***p/s*** cameras.

Digital fixed lens cameras have continuous viewing via a Liquid Crystal Display screen (LCD) at the rear of the camera, but, like traditional compact film cameras, most models also have simple optical viewfinders. The optical path from object through the lens to the sensor runs parallel to the path from object to the viewfinder, so what you see is not exactly what you get. This is called "parallax error". It explains why heads or feet are sometimes missing from your photos when you thought you'd framed them carefully. The LCD gives more accurate framing for digital cameras than the viewfinder. Digital compacts have a small image sensor or CCD (Charge-Coupled Device – see the section on scanners). Most point-and-shoots have built in flash, while higher-end models also have auto-focus, red-eye reduction with a pre-flash system and zoom lenses. Some may also have the facility to take movie clips. Fixed lens cameras may be altered through the use of add-on converters for the lens such as telephoto or wide angle, though these tend to give inferior image quality. Another disadvantage is that compacts have a significant delay, called shutter lag, between the time of releasing the shutter button and capturing the image, and a further delay while processing and storing the data, which makes them unsuitable for action and sports photography. They also have a limited effectiveness in low light situations. Many p/s cameras are small and lightweight for convenience, but there are also medium and large models on the market, so size is not an indicator of camera type. Although generally more expensive than analogue point-and-shoots, digital compacts are becoming more affordable at the lower end of the market.
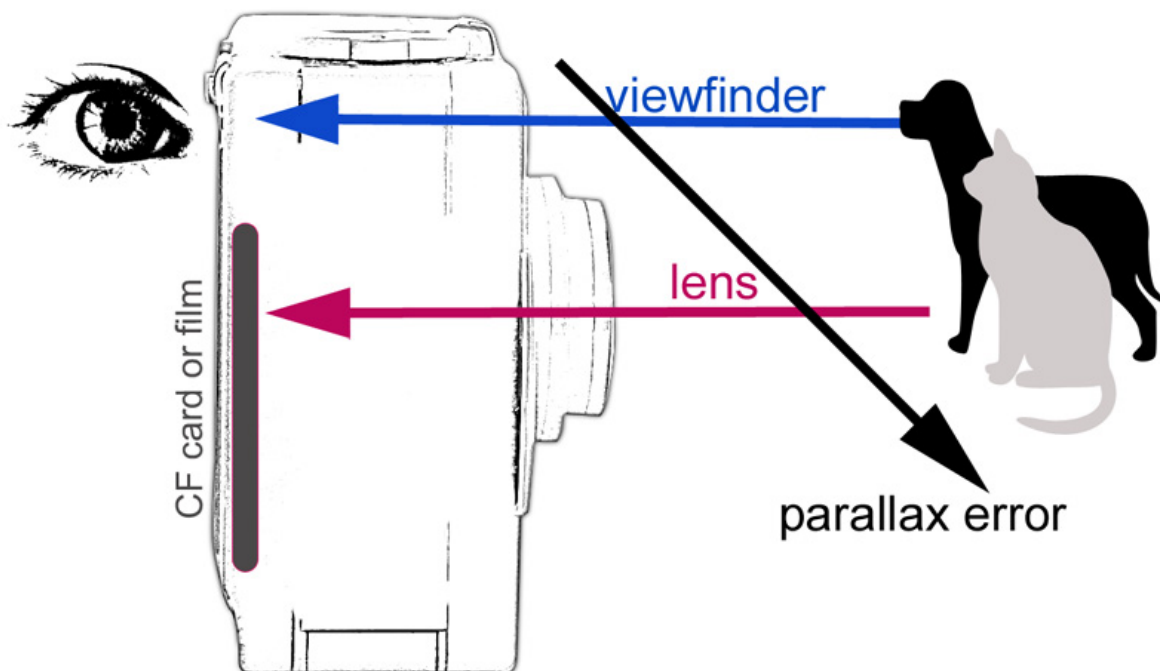
Activity 2

Use a search engine to find a picture of a fixed-lens analogue camera and a fixed-lens digital camera on the Internet. How much do they cost? Copy and paste the pictures and type the cost into the prepared worksheet in the Extras section for your digital sketchbook. Save the work as *1Acamera_typesXXX*

Fact file 2b

Different types of camera: single lens reflex

Single-lens reflex cameras, which like compacts can also be digital or film format, are increasingly used by professional as well as serious amateur photographers. They are often referred to as *SLRs* or *DSLRs* (Digital SLRs).

Unlike compact cameras, their lenses can be removed, allowing a wide range of interchangeable professional lenses to be attached. In a single-lens reflex camera the light from the object reflects from a mirror and is taken through the viewfinder to the eye of the photographer, so that what is seen in the viewfinder is exactly what will be recorded on the image. Compared to most fixed-lens compact cameras, SLR lenses permit photographs to be taken in lower light conditions without flash and to have a greater range of technical options. There is no shutter lag, so these cameras are ideal for action shots. During exposure when the shutter is open, the mirror flips up out of the light path to uncover the electronic sensor or CCD. However, as a result the LCD on DSLR cameras cannot show the image while you are composing a photo; and, for the same reason, neither can they be used to take short movie clips. They tend to be significantly higher cost than compacts.
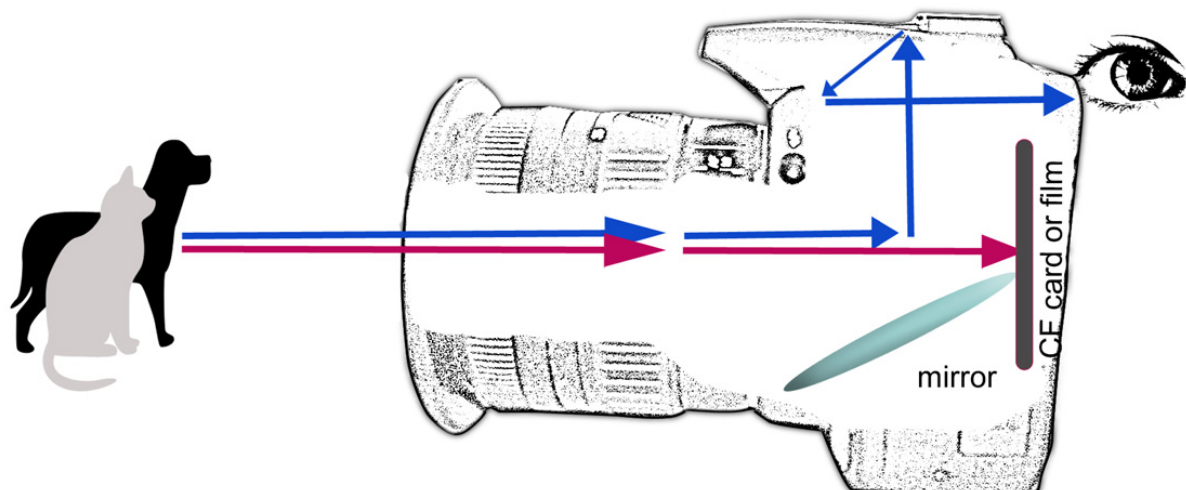
Activity 3

Use a search engine to find a picture of an analogue SLR and a digital SLR (DSLR) camera on the Internet. How much do they cost? Add the pictures and prices to the document you started in Activity 2. Save your work.

Activity 4

Four people are looking to buy or use a **digital** camera for a particular purpose. Which type of camera would you recommend in each case – digital compact or DSLR? Add this information to your *1Acamera_typesXXX* document and save it.

Case 1: Carla is going on holiday soon with a group of friends. She wants to be able to take her camera everywhere and shoot some video clips of the trip as well as still photos.
Case 2: Jo is a teacher and is looking for an adaptable, easy to use camera for school.
Case 3: Duncan loves sports photography, especially football, and would like to have a continuous shooting option to take many frames in quick succession.
Case 4: Ashley goes to a lot of music gigs in clubs in his free time and would like to photograph the bands for an online fanzine he wants to launch.

Activity 5

Look at fact files 2a and 2b again. On the same worksheet (*1Acamera_typesXXX)* make a list of 5 advantages of digital cameras. What are the main disadvantages of digital compacts? List them too. Do digital SLRs have any drawbacks? If you think so, add them to the final column. Save your work.
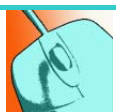
Activity 6 - Extension

Other types of specialist cameras exist that are mainly film format, not digital. Choose one from the list below to research on the Internet. Find a picture of the type you choose and explain what it does and for what purpose it would be used. Record your findings for your digital sketchbook and give your sources by copying and pasting the URL of the web page where you found the information. You can use the prepared worksheet in the Extras section or make your own. Save your work as *1Aspecial_cameraXXX*. Your class could use the information to make a group PowerPoint or other multimedia presentation.

Specialist camera types:
Twin lens reflex
Large format
Field camera
Monorail
Panoramic
Instant
Pinhole

Fact file 3 - Cameras: how they work

*Like a scanner, a camera is also an image capture device.*

Origins

The word 'camera' comes from the Greek word for room, whilst 'photography' literally means 'drawing (graph) with light (photo)'. Sir John Herschel, a 19th century astronomer and one of the first photographers, invented the term in 1839. In daylight a chink in the blinds or curtains of a darkened room will allow an image of the scene outside the window to be projected onto the wall opposite. Visitors to the surviving Victorian Camera Obscura (literally 'dark room') attractions in Edinburgh or Bristol can still see this effect clearly. Photography was made possible when someone discovered a chemical method of recording the reflected image or "light drawing" permanently. From the simplest pinhole camera to the most complex technology the principle of how cameras operate is the same, consisting of three basic elements: optics (lens/pinhole), a lightproof container (camera body/ darkened room) and a recording support (film/electronic sensor/wall). Rays of light from an object are redirected through the lens so that they converge back to one point, forming the image, but because light travels in straight lines the projected image is reversed and upside down.

lens or pinhole
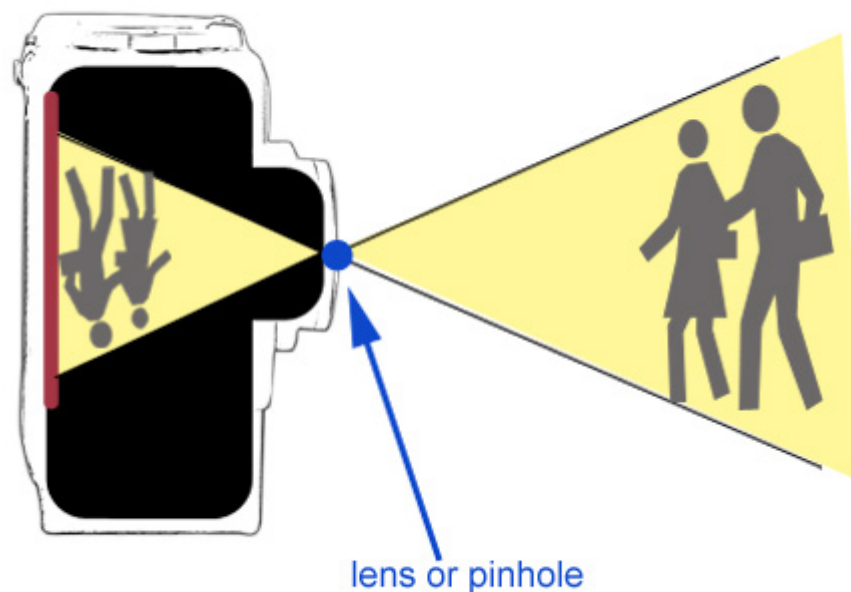
Digital

One of the most influential technological breakthroughs of the past two decades has been the way in which visual and audio data is handled: conventional analogue information (represented by a fluctuating wave) is converted into digital data (represented by ones and zeros, or bits). Whereas conventional cameras depend on chemical and mechanical processes, digital cameras have a built-in computer and record images electronically by focusing the light that passes through the lens onto a sensor or CCD, rather than film. Some cameras use a different kind of sensor called a CMOS (Complementary Metal Oxide Semiconductor), but whatever the technology both types of sensor perform the same function: they turn light into electricity.
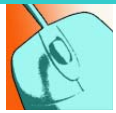
Activity 7

Use the prepared worksheet in the Extras section to label the main components of a fixed lens digital camera, or prepare your own diagram. Save the file for your digital sketchbook as *1Acamera_partsXXX* (replace XXX with your own initials or naming convention agreed by your ICT teacher).

Fact file 4 - other sources of digital graphics

Digital scanners and cameras are the two most common sources of digital graphics, but they are not the only ones. You can also obtain digital graphics from the Internet, from CD-ROM or DVD photo-libraries and from graphics pads, which allow you to make original digital drawings on a pressure-sensitive pad with a stylus rather than a mouse.

Primary sources
These are original graphics you have created yourself. They could be photos you've taken with a digital camera, slides captured from a digital microscope, as well as sketches, drawings, paintings, collages, plans or diagrams you've made with traditional implements and scanned, or created digitally from scratch.

Secondary sources
If you decide to use any images or information from secondary sources such as the Internet, CD-ROMs, or scanned books, magazines and newspapers, you must do two things: check for copyright restrictions and name your sources in your reference list, and next to the work itself whenever possible.

Copyright
You are probably already aware of the tough measures that record companies have taken in recent years to prevent anyone downloading free copies of their music from the Internet. You may also know that people who are caught selling bootleg copies of videos are routinely prosecuted and fined. But did you know that these laws of copyright also extend to printed and electronic texts and images, as well as software?

IPR
The rights and regulations protected by the Copyright Designs and Patents Act 1988 are called intellectual property rights, or IPR. They are designed to make sure the owner of the copyright is not commercially exploited, can keep control over their original work and can get

a fair financial return for it. If you plan to use images taken from the Internet in your work, you must make sure that they are copyright free, or ask permission from the copyright owner – most websites have copyright information that you should read. Some schools have online access to archives of copyright free images like SCRAN, so always check with your teacher: http://www.scran.ac.uk

For further information on how copyright regulations might affect your work in school, visit the Intellectual Property and Copyright section of the Superhighway Safety site published by the DfES:

http://safety.ngfl.gov.uk/schools/document.php3?D=d69

Plagiarism

Ideas are also subject to intellectual property rights if they have been recorded or published in some way, whether on paper or electronically. Passing off someone else's ideas as your own is called plagiarism. Plagiarism is regarded as a serious offence by examiners because it is seen as a form of cheating or stealing. On the other hand, if you read something useful that you want to include in your own work, this is encouraged and will get you higher marks, as it demonstrates that you have researched widely and can support your own ideas with comments from experts. So it's essential that you reference your sources carefully, identifying clearly the original author of the ideas or words.

Referencing

Get into good habits by listing all the secondary sources you use in your projects and where you found them. Ask the copyright owner's permission to use any images that are not copyright free by writing or emailing. Start a reference or sources log when you begin your project and keep adding to it as you go along. Don't wait until the end to do it!

The Harvard System

The most commonly accepted referencing format is called the Harvard System. It's not difficult to use:

- 🏆 **For books**
    - make a note of the author or editor's surname followed by their initials, the date of publication, the book title, the publisher's name, plus the edition and page number if relevant
    - e.g. Williams, R and Tollett, J (1998) The Non-Designer's Web Book, Berkley, California, Peachpit Press

- 🏆 **For magazines and journals**
    - note the author, the title of the article, the name of the publication, its issue date and number, and also its volume number if relevant
    - e.g. Simionato, A (2004) Contemporary Magazine Design, Computer Arts Projects, issue 63, October, pp 22-27

- 🏆 **For websites**
    - copy and paste the URL of the page onto your reference list, note the author's name if available, the date published to the web if available (check the bottom of the page), the type of electronic format if relevant, and also the date you accessed the site
    - e.g. Kinsey Milner, R (2004) Graphic Design - Club Flyers, online presentation, available: http://www.virtualartroom.com/presentations1.htm#Flyers [accessed 1 August 2006]

Activity 8

Start a reference log now. Open the template in the Extras section and save it with your own initials as *sources_logXXX*. Add information to it every time you use a secondary source, image or text. You can identify graphics from secondary sources with a thumbnail too if you like.

Mini brief - Photo story

Your local newspaper has announced a competition for young photographers on the theme *Get the buzz!* You must take 5 photos that show a sense of action, excitement or creativity, as well as your skills as a photographer. Think about the top tips to get good results and try to illustrate one of the golden rules with each picture. Download or scan your pictures to a new folder in your work area called *buzzXXX.*
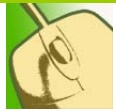
Review

Show your photos to a friend and to your teacher and ask them for feedback. What do they think is good about them and what could be improved? Do you agree with their comments?

Download a blank feedback and review form to use and save it to your digital sketchbook or project folder as *1Areview_buzzX XX*

Self-review

Open the **Part 1** skills and evidence checklist you started before and complete **1a Digital camera** How much have you learned about using a digital camera? Is there anything you are unsure of? Save the document again.
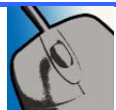
Extras for this section

📁 Activity 1 – scaffolded worksheet for photo choice

📁 Activities 2, 3, 4, and 5 - types of camera

📁 Activity 6 – Special camera types

📁 Activity 7 – camera parts

📁 Activity 8 – sources log

📁 Feedback and review form

📁 Self-review: skills and evidence checklist