

Digital Cameras



The school's digital camera has been in constant use since it was purchased last year. First-year students used it during a trip to the zoo, printing out the best photos as soon as they returned, while third-year science students are currently using the camera every Tuesday to take pictures of the different stages of an experiment. The images will be used in their reports.

What is a Digital Camera?

A digital camera works in the same way as a normal camera but requires no film. Instead, the pictures are stored electronically on a small memory card inside the camera. When this card is full, the pictures can be transferred to a computer, allowing the memory card to be used repeatedly. Most digital cameras allow photos to be viewed on an LCD (liquid crystal display) screen embedded in the camera. This enables photos to be viewed immediately after they've been taken and deleted or saved as required.

Images captured using a digital camera can be:

- Downloaded to a computer for viewing, manipulation, slideshow creation, printing or for use on a Web page
- Displayed on a television screen
- Copied to a video cassette recorder, or DVD
- Printed directly from the camera or memory card

Digital cameras are powered by batteries and usually have many of the features of regular cameras, e.g. an optical viewfinder, a variety of flash and exposure modes, a zoom lens and a self-timer.

Possible Educational Uses

Digital cameras create exciting learning opportunities for students of all ages and abilities. They can be used to:

- Capture fieldwork, particularly in the Geography, Science and Nature subject areas
- Take images for inclusion in individual project work or for use on the school Web site
- Create multimedia presentations or enhance newsletters
- Teach children about photography
- Record images of art and craft displays and school events such as plays, recitals or parents' nights
- Develop personalised student resources— using pictures of students, their families, their friends and their local environment. This can be highly motivating, especially for students with special needs
- Create animated films using additional software such as Claymation or Photostory. These could then be used in multimedia presentations or uploaded to a website.

Technical Considerations

Most cameras have an LCD screen for viewing pictures and this should be considered an essential feature when assessing different products. By previewing pictures, poor or irrelevant images can be deleted immediately, thereby ensuring optimal usage of the camera's storage capacity.

Memory Cards and Other Storage Devices

Most camera manufacturers use one of the following memory cards inside their products: SmartMedia, CompactFlash, a memory stick, multimedia (MMC), secure digital (SD) or xD cards. Other older storage systems include floppy disks, (although they do not facilitate high resolution images) and mini CDs. The higher the pixel count of the image, the greater the size of the file to be stored and therefore, the greater the need for a large capacity memory card. The size of the memory card supplied with the camera should always be checked. Card readers that can download images from many different types of cards are an ideal purchase for schools and can be left permanently connected to a PC.

There is always a trade-off between the resolution at which images are recorded and the total number of images that the camera can store. This can be controlled in two ways:

- by reducing the image size
- by compressing the image when saving it as a file

Most cameras provide a choice of two or three image sizes, with two or three levels of compression available for each size. These compression options are usually described by words such as 'basic', 'standard' and 'fine', with "basic" resulting in the smallest files sizes and "fine" resulting in larger files. Choosing the smallest image size and highest level of compression will result in the smallest possible files and thereby allow more pictures to be stored on the card. These photos would however, be low quality images and would not be suitable for printing purposes. They would be ideal for on-screen display, e.g. on a Web site. If in doubt as to the final usage of the photo it is always wise to shoot with the highest quality the camera is capable of, as larger images can be compressed in size later.

Purchasing Considerations

As with film cameras, the quality and price of a digital camera varies greatly. Much will depend on the specification required. The main deciding factors for price are usually the resolving power of the camera, i.e., the number of pixels (dots) the camera can record for each image and the size of the optical zoom range (3X up to 10X). The higher the pixel count is, the more expensive the camera. Products range from approximately 3 mega pixel models, which are relatively inexpensive, to 8 mega pixel models, which can cost twice as much. The pixel count also has an impact on image quality — in general the higher the number of pixels, the better the quality.

Zoom Lens

A zoom lens adds to the overall cost of a camera but it is a recommended feature. An optical zoom provides good value, whereas a digital zoom, though useful, uses software to enlarge a section of the image with obvious loss of image quality. A 3X optical zoom should be regarded as the minimum requirement and if the camera is to be used frequently for sporting events such as football, hurling or track events a 10x or 12X zoom should be considered (with image stabilization if affordable). Currently, a recognised brand of camera with 5 or 6 mega pixels and a 3X zoom would be sufficient for most school usage and could deliver quality prints up to 255mm x 205mm as well as offering good value in terms of features versus price. Prices are around €250 for this level of quality/zoom camera with an additional €100 (approximately) for a zoom lens range of up to 12X.

Batteries

As digital cameras are extremely demanding on batteries, a model that includes rechargeable batteries and a charger as part of the kit should be purchased. In addition, the following components or add-ons are recommended:

- Lithium ion or Ni-MH (Nickel metal hydride not Nickel cadmium) batteries
- Spare batteries — each set should be marked differently or different brands should be bought so that uncharged and charged batteries do not get mixed up
- Normal AA style Alkaline batteries can be used in place of NiMH type rechargeable AAs in an emergency but they will deplete very rapidly as they are not suitable for this type of heavy current usage.
- A carry case
- A second memory card to store extra pictures — ideal for school excursions where there is no access to a computer to download images and clear the memory card

Always compare the specifications of a few models in a given pixel/price range. Newer models often have many additional features that are useful. Most have the ability to record short video clips and to present a slide show of images from the camera to a TV. Image stabilization is an emerging technology that would be useful where the camera uses a larger zoom range.

When comparing cameras, attention should be drawn to the following:

- Compatibility of the supplied software with the computer operating system (e.g., Windows XP/Vista or Mac OS)
- Ergonomic features for comfort and balance — it may be necessary to consider if children's 'small fingers' would easily find their way in front of the flash or the lens. Sometimes bigger is better!
- Does the camera have an optical viewfinder (look through). An LCD screen is vital but very difficult to see when working outside in bright sunlight. The best solution for schools is a camera that has both types of viewfinders.

Relevant Web Sites

Digital Cameras in the classroom

www.brunswick.k12.me.us/lon/lonlinks/digicam/home.html

Useful links and tips on purchase and use of digital cameras.

1,001 uses for a digital camera

<http://pegasus.cc.ucf.edu/~ucfcasio/qvuses.htm>

This site is designed as a reference tool putting educators in touch with creative educational applications for digital cameras in educational settings.

Digital Photography Review

www.dpreview.com

This is a leading web site for camera reviews and opinions, and the latest news on matters relating to digital photography. The forums allow one to browse other people's comments about a particular camera. The 'links' section has some good additional review sites.

Digital Camera Advice Centre (UK)

www.cameras.co.uk/html/digital-cameras-world.cfm

Advice section of this UK site – answers to key questions when purchasing a camera. There are also good links to camera reviews, models, ranges and manufacturers.

Kidz Online

www.kidzonline.org/TechTraining

This is a US based non-profit educational organization whose mission, vision and values are dedicated to preparing K-12 (Primary School) students and teachers to live and work in the information age through innovative peer-to-peer technology training distributed using advanced digital technologies.

Digital Camera HQ

www.digitalcamera-hq.com/digital-cameras/digital-cameras-the-top-10-things-you-need-to-know_roundup.html

Digital Cameras: The top 10 things you need to know, includes useful tips and reviews.

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