



## The Use of Digital Cameras to Enhance the Learning Experience

### Digital Cameras: Overview

It is likely that by now most people know what a digital camera is - or at least have heard of one. However, it is most unlikely that people would associate digital cameras with education. With the technology present today, nothing seems out of the realm of use for any activity, be it fun or learning. Video games traditionally were only thought of as kid distractions, but today they are being used as a teaching tool. Computers and the Internet are probably the most central components of the use of technology in education. And now, the advent of digital cameras makes learning fun.

Digital cameras are similar to conventional ones in that they range in quality and cost. Both have a lens that focuses an image onto a Charge Coupled Device (CCD), which then converts the image into electrical pulses. Both then store the image onto a "storage medium." However, the similarities stop here.

Digital cameras differ from conventional cameras in the way they function. Similar to a conventional camera, when a picture is taken, the shutter opens, allowing light to enter the camera and strike the CCD. Where a digital camera differs is that once light strikes the CCD, it is then sent to the internal memory of the camera, called the buffer. After the image information reaches the buffer, it is then compressed into JPEG format. The completed image is then transferred to the memory card on the camera (the storage device). For some cameras, this process causes a lag time, and therefore one cannot take another picture immediately. Others have enough of an internal buffer to allow for multiple pictures to be taken in a row, called burst shooting.

### What to Consider When Buying

When buying a digital camera, ask yourself a few questions. How will I be using the camera? Will I be emailing pictures, or doing a lot of printing? Will I be publishing on the web? Will it be for home use, or will I be doing professional layouts? Will I be using it indoors or out? Daytime or at

night? Will I be taking mostly portraits or landscape shots? Action or still?

With these questions in mind, here are several things to consider when buying a digital camera:

1. **Resolution:** this refers to the number of dots or pixels per an image. The more pixels there are the better the resolution and the quality of the image. Older cameras offered 1- to 2-megapixels. Newer ones are offering up to 4- and even 5-megapixels. As a rule of thumb, a 2-megapixel camera can produce a good 5-by-7 print; a 3-megapixel camera, an 8-by-10; and a 4-megapixel one, an 11-by-17 print. The way a camera will be used will help determine the amount of resolution you will need.
2. **Size, Weight and Design:** Cameras range in size from 6.8 ounces to 2.6 pounds. If portability is important, consider the size and weight of the camera. Smaller cameras are convenient, but also have smaller dials and buttons that could make using them more difficult.
3. **Zoom Lens:** Some cameras offer optical zoom, while others have digital zoom. Optical zoom moves the lens to magnify the subject, while digital zoom only captures fewer pixels and magnifies them. This clearly would jeopardize the quality of the image. It is recommended that for best results, to go with at least a 2X optical zoom.
4. **Focus:** Digital cameras often offer automatic focus, which for most of us is sufficient. For the few cases where in a close up shot the camera cannot get a focus lock, a manual focus would help.
5. **Storage:** In lay terms, storage refers to the medium where pictures are stored once taken. In a conventional camera, that would be the film. In digital cameras, it ranges from floppy disks, to compact disks, to memory cards. Floppy disks are the least expensive but storage on them is slow and the disks can only hold one or two high-resolution images. Compact disks store more images, but the cameras that use them are bulky. Memory cards are the most expensive, but allow the

most flexibility in camera size as well as storage capacity. While most cameras have onboard storage, investing in additional removable storage allows for expansion of storage capacity.

6. **Movies and Sound:** Some cameras offer the option of video capture. This is handy if you do not have a video camera, but since video takes up more storage than images, the clip is usually no more than 30 seconds.
7. **LCD Screen:** Probably one of the most compelling reasons to purchase a digital camera is that you can see the image right away and decide whether or not you like it and want to keep it. To do so, however, you need an LCD screen on the camera. Low-end models often omit this option, thus taking away one of the most exciting features. This is one feature you should not go without. However, be sure to try the camera before you buy it - some screens wash out in the sunlight, making it difficult to see.
8. **Memory Card Readers:** These are similar to external hard drives that attach to your PC. These allow you to download pictures directly from the storage medium, which saves time as well as battery life.

### Using Digital Cameras in the Classroom

Teachers are using digital cameras to enhance education inside and outside of the classroom and from all accounts, the students love them as much if not more than the teachers do. In addition to the above mentioned advantages offered by digital cameras, teachers believe that digital cameras help students to become more involved with the subject at hand. With any project, the use of a digital camera becomes a cognitive process as the students reason and plan what pictures to take and why those pictures are needed. As Craig Nansen, technology coordinator for Minot (N. Dakota) Public Schools, put it: "One of the main goals of students using technology is to become creators of content. Pictures of field trips or area events, local historical or geographical sites of the school and city, documentaries of athletic and cultural events, and artistic photography all are great examples of students creating content." Additionally, cameras enhance the skill of "purposeful observation," as put by another Minot Public School teacher.

Some tips on using a digital camera in the classroom include the following:

1. Purchase an inexpensive camera for the students to use and a more expensive one for the teacher. Consider the potential for damage and do one-on-one training sessions with the students to ensure proper usage of the camera.
2. Ensure that students take appropriate photographs. Go over basic photography rules with the students and make

sure they know the difference between what is appropriate and what is not.

3. Keep in mind privacy when publishing photographs and be aware of your school's policy regarding pictures and publication of pictures.
4. Let students work with the images, cropping, editing, etc. so they can learn to optimize images for the web.
5. Have at least one computer that has Photoshop Elements or a similar type image editor.

### Some Projects for Digital Cameras

Digital cameras offer teachers unlimited opportunities to engage students and to incorporate technology into their curriculum. Here are some examples:

1. Assign pairs of students to go on a walk through the school to find examples of geometric shapes (circles, triangles, parallel lines, obtuse angles, etc.)
2. Create a "School Rules" or "Class Rules" book complete with illustrations of acceptable behaviors with students posing in appropriate activities.
3. Have teams of students take pictures of everyday things and put into KidPix/Powerpoint with English and Spanish/French vocabulary. Print out for a classroom "Pictionary."
4. Use student photos for "Student of the Week" displays, special certificates and awards.
5. Take photos on a class field trip. In the classroom, each student can choose a picture to label with a short description of what was happening or why this was important. Print a copy for everyone.

These are but a minute list of the vast number of ways to use cameras in the classroom. Here are some sources where teachers have shared their ideas:

**Science Teacher Stuff** (this page contains links to other sources)

<http://www.scienceteacherstuff.com/techdigcam.html>

**Using a Digital Camera in the Elementary Classroom:**

<http://agassizsd.mb.ca/centennial/camera.html>

**1001 Uses for a Digital Camera:**

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

### Sources and References:

[http://aolsvc.pcworld.aol.com/computercenter/aol/bguides/0\\_guid\\_12\\_page\\_1.00.asp](http://aolsvc.pcworld.aol.com/computercenter/aol/bguides/0_guid_12_page_1.00.asp)

<http://bmrc.berkeley.edu/articles/9612-01.html>

<http://www.sony-digitalcamera.com/howwork.html>

[http://www.education-world.com/a\\_tech/tech147.shtml](http://www.education-world.com/a_tech/tech147.shtml)

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<http://www.tech4learning.com/services/teachingwithdigitalcameras.htm>

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