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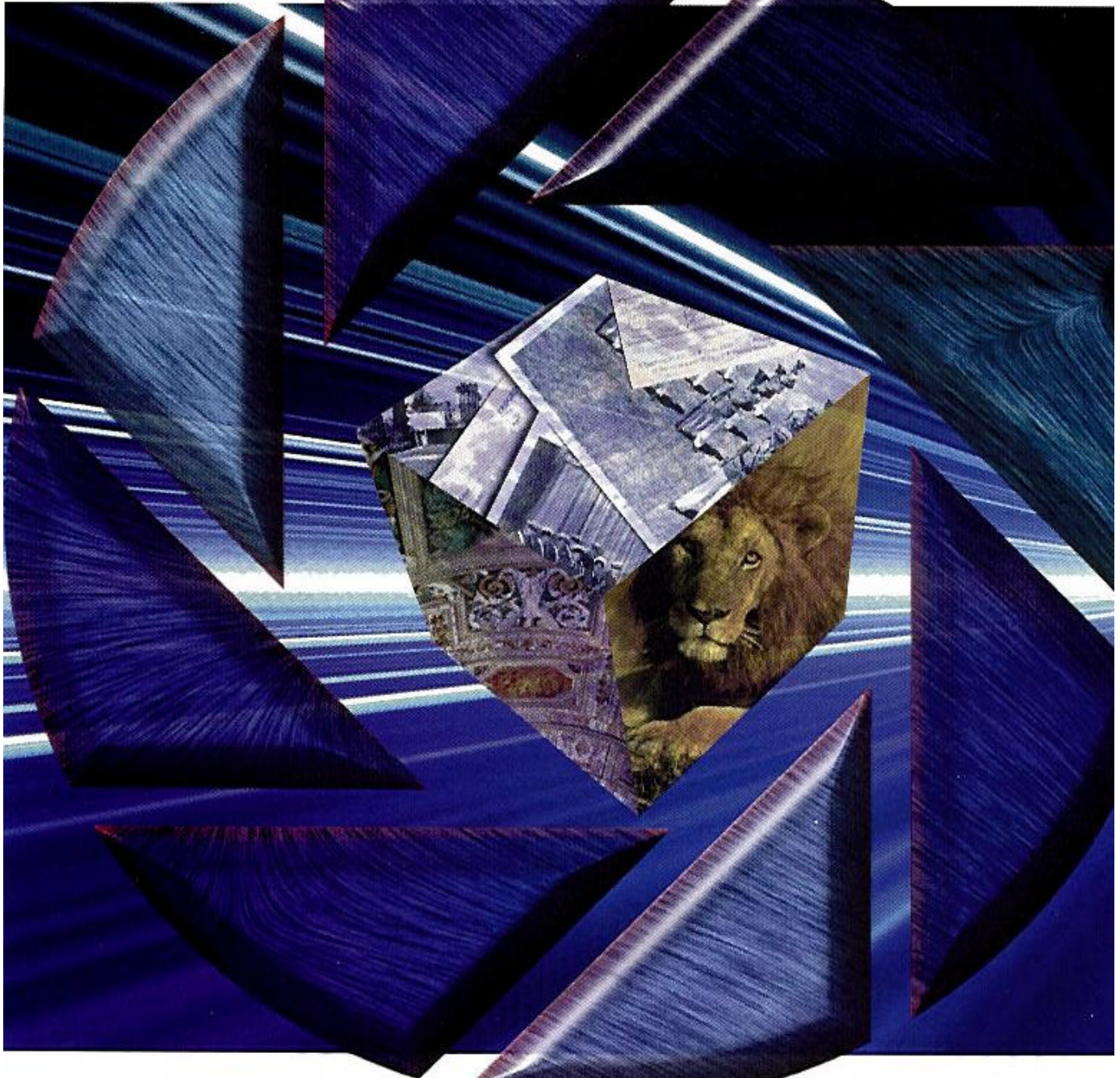Yahoo

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Digital Cameras:

Ready, Aim, Click!

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Wondering how to extend a field trip? Enrich student portfolios? Streamline administrative record-keeping? Consider using a digital camera.

Digital cameras can do just about anything that film cameras can do, often better. Basically, the operation of a digital camera is no different from any other still camera: Ready, aim, and click the shutter to capture the image. To take full advantage of the capabilities of the digital camera, use it with a computer and the software and cables that usually come bundled with the camera. Placing a digital camera in the hands of a student or teacher unleashes creativity and opens up new possibilities for all areas of the K-12 education spectrum.

THE TECHNOLOGY: HOW IT WORKS

Hardware and Software

The digital camera uses a relatively new form of technology which requires no film but instead stores images in a digital format within the camera's internal memory. The internal memory functions like a small hard drive where images can be saved or deleted. Certain cameras are equipped with removable flash card memory that can be removed and replaced like miniature floppy disks.

Most cameras communicate with desktop or laptop computers via serial, parallel, or dedicated cables. Cameras sporting PCMCIA-type memory cards allow the removable cards to be inserted directly into the computer's card slot. In both cases, you download the images to a computer running imaging software bundled with the camera. Then the images can be converted to convenient file formats such as bitmap or

JPEG for use in a myriad of applications. (A new camera from Sony completely eliminates the download and convert steps by using actual 3.5" floppy disks to store its images.)

Applications

The software that comes with the camera is used for viewing the images stored in the camera as well as for a range of other things—from retouching images to creating zany morphs. Typical imaging software will perform cropping, color changes, resizing, contrast adjustments, sharpness enhancement, and text editing on photos. Using the camera as a computer peripheral is a new approach to photography, but one that is easy for both teachers and students to learn.

Flexibility, control over the photos, and instant use of pictures are some of the advantages of digital photography. In addition, once the initial investment is made in the camera, there are no processing costs for pictures. The only ongoing expenses are for batteries, disks to archive the images, and media for printing images. Digital photographs have infinite uses and can be printed endlessly on glossy paper, transparencies, iron-on transfer, Post-it notes, labels, envelopes, certificates, posters, banners, and many other media. Digital images can also enhance your school's Web page with photographs of school events (see Figure 1).

Practical Considerations

The quality of the printed product depends on the quality of the paper, printer, copier, and, of course, the resolution of the camera. Digital cameras can be had for under $200 with low resolution images and basic features. Adding higher resolution, flash, zoom, and video output will boost the price to $200-$750. Professional quality digital cameras cost over $1,000. Each camera offers its own suite of features, accessories, and capabilities as outlined in the accompanying chart. For the latest information in the dynamic field of digital photography, contact the manufacturers via the Web sites listed at the end of this article.

Figure 1
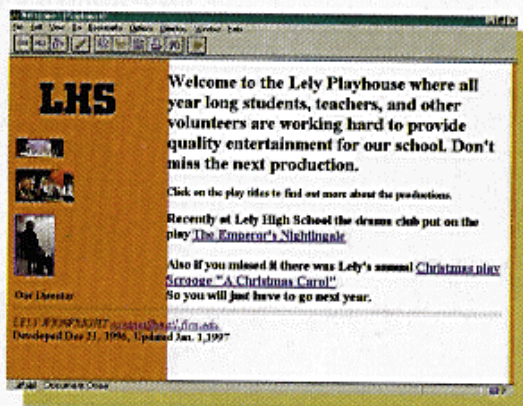
Digital photos are an excellent way to enhance a school's Web site. Here, clicking on the photos gives the user more information about student theatrical productions.

When choosing a camera, carefully consider how you will use it. To print photos, put your money into high resolution images. For digital applications, look for cameras with large memory, flash, zoom, and attachable lenses. Cameras with built-in viewing panels like small television monitors are easiest to use because they need not be connected to a computer in order for you to view the images. The view screen will let you know immediately whether you have a good picture, and you can select images to delete when the camera memory gets full. A bonus with some cameras is the ability to connect directly to a television or video cassette recorder for viewing and recording video images. Most cameras are compatible with both PC and Macintosh computers.

CURRICULUM TOOL

As a curriculum tool, digital cameras add a multimedia dimension to learning. Beyond simply recording events, digital images transform documents, presentations, and communications into personalized, custom productions. Using software such as PowerPoint or HyperStudio, projects that showcase school activities come alive with digital photos. Students quickly master the art of shooting photos and recording them on a video cassette recorder to share their learning in class, at home, or far beyond through network technologies (see Figures 2 and 3).

Digital photographs can be encorporated into various student projects: activity sheets illustrating maps or science equipment, posters of sports positions or choreography, iron-on transfers of national flags, creative crests with faces, and fliers for community or school events. Students can write stories to accompany the photos they shoot. Video productions incorporating digital images directly from the camera can be produced instantly and dubbed with a student speech or music track from the school band. These products can be shared in class or with broader audiences via e-mail or the Web. They can also be used at the annual "Open House" to show parents what their children are learning at school.

GRAB BAG OF CLASSROOM ACTIVITIES

Elementary School

During a class field trip to the zoo, elementary school students could take turns photographing animals with a digital camera. Back in the classroom, the images from the digital camera might be imported into something like HyperStudio. The students could create a booklet in the form of an animal alphabet and illustrate each letter with a different animal and description. Poster-size pages from the animal alphabet could be hung in the room, and a copy of the booklet sent to the zoo with a "thank you" letter from the class.

Elementary school-children could use a digital camera to document local historical sites, important people in the community,

Figures 2 and 3

Zoo Alphabet From Our Trip

A a

A is for Alligator

A Trip to Dinosaur National Park

- Located in Colorado
- Contains the Fossil Wall
- Fossil Skeleton Exhibit
- Fossil Processing Lab
- Desert Ecology

With presentation software, digital images can create a permanent record of school trips. Shown here is an alphabet book done after an elementary school trip to the zoo and presentation on the Dinosaur National Park done for a high school Earth Science course.

and portrayals of past events. The students might then assemble the photos into local history mural for display in a school or local community site such as a public library, city hall, or post office. The mural could even become the featured illustration for a local publication, publicity campaign, or banner.

Middle School

During the study of geometry, middle school students could photograph objects in nature which illustrate geometric shapes and properties. Using PowerPoint or HyperStudio, they might present their interpretations of the objects and share their findings with the class. With Adobe PhotoShop, students could crop portions of their photos to create a tessellation or a 3-D animation of a shape.

At the completion of a food and nutrition unit, the Health/Consumer Sciences class in the middle school could use digital images to demonstrate their knowledge of food groups and a healthy diet. Students would photograph a variety of foods and packages to make a game in which the object is to arrange the food pictures into healthy meals. The class might then use the game to teach the neighborhood preschool children about proper eating habits. The unit could culminate in a party in which the older students prepare snacks for the younger children and take pictures of them eating "healthy" food.

High School

A high school Earth Science class could take an electronic field trip to a distant location like the Dinosaur National Park by accessing the intranet or an Internet Web site created with photographs taken by a pen pal (or key pal) at the site. The digital images e-mailed from the remote site could be added to a PowerPoint presentation or an HTML document that describes

Camera "Snapshots"

Apple Quick Take 150
$600
standard resolution, up to 32 images, flash
http://imaging.apple.com/cameras/cam-main.html

Canon PowerShot 600
$950
high resolution, up to 18 images, flash, macro
http://www.powershot.com/

Casio QV-11
$300
low resolution, up to 96 images, LCD display, video, macro

Casio QV-100
$600
standard resolution, up to 92 images, LCD display, video, macro
http://pegasus.cc.ucf.edu/~ucfcasio/camera.htm

Epson Photo PC
$400
standard resolution, up to 32 images, flash, lens mount

Epson Photo PC 500
$500
standard resolution, up to 200 images, LCD display, flash, lens mount
http://www.epson.com/homeoffice/

Fuji DS-7
$700
standard resolution, up to 60 images, LCD display
http://www.fujifilm.co.uk/ds-7/exs.htm

Kodak DS-20
$300
low resolution, up to 16 images

Kodak DS-40
$600
standard resolution, up to 96 images, flash, lens mount
http://www.kodak.com/aboutKodak/bu/dai/hub/education/sharing InfoOnline.shtml

Sony DCS-F1
$850
standard resolution, up to 108 images, LCD display, flash
http://www.ita.sel.sony.com/technology/feature/cameraguide.html

▶

Beyond simply recording events, digital images transform documents, presentations, and communications into personalized, custom productions.

the photos, links to a glossary of scientific terms, and asks follow-up questions about the geologic features seen in the pictures. Each student could choose an image and use a program like PhotoShop to produce a 360-degree panorama of an area.

ASSESSMENT

A student portfolio is a powerful and authentic means of ongoing assessment. The portfolio collects samples of the student's best work as a testament to his or her abilities and growth, providing a more complete picture of progress than a test score. In a digital portfolio, the student's writing, presentations, audio clips, and other accomplishments are stored as digital images. Student portfolios become richer with the addition of images of student work and performances.

For example, as each art project is completed over the course of the marking period, high school students might use a digital camera to photograph their work. As the grading period draws to a close, each student evaluates the pieces he or she has created and assembles the best into an individual electronic portfolio or gallery for assessment. The teacher or the class might select images of outstanding projects to be viewed as a digital art gallery on the school's intranet.

Traditional test instruments are also improved with the realism of digital photos. Actual classroom or lab images offer a more authentic method of measuring knowledge. For example, a laboratory exam with photos of the lab equipment used by students more accurately tests their memory of the processes they learned. Concept learning is strongly associated with visual cues, so the images used to test learning should be as realistic as possible.

ADMINISTRATIVE SUPPORT

Digital photography streamlines many of the management tasks in a school. The tasks of equipment handling and record keeping are done more efficiently and can be quickly updated with digital images. Inventories and identification pictures kept on the school network make the data more accessible and take less space than paper files. Teacher tasks are also supported by digital photography. For example, our attendance rolls and seating charts are much more useful when they include student photos.

Photo ID cards, certificates, awards, and signs with the visual impact of photos of recognized faces are all quickly created with the help of the digital camera. School publications can incorporate photos in less time and at no cost when the photos are digital. Newsletters, brochures, and a digital yearbook that include digital photos require a shorter production time

because the photos are processed on the school site.

Some applications are more elaborate than others. For example, a high school can produce its own electronic yearbook with digital photos of students, staff, teams, and important events of the year. Thumbnail images of plays, athletic matches, and academic competitions can be added to the school's Web site for ongoing communication to the community as well as a lasting record for students.

LEARN MORE

Like most applications, once you begin to use a digital camera you will learn more about them and begin to develop your own educational applications. Some ideas are provided by camera manufacturers through help lines and World Wide Web sites; many include lesson plans, ideas, and updates. Teachers contribute classroom-tested activities to the Web databases. The Casio page can be found at http://pegasus.cc.ucf.edu/~ucfcasio/camera.htm, and the Kodak page is http://www.kodak.com/aboutKodak/bu/dai/hub/education/sharingInfoOnline.shtml.

The digital camera could soon become one of the most used and indispensable technology tools in school.

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