

Digital images

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**PIXELS,
RESOLUTION,
MEGAPIXELS,
DPI, ETC.**

Pixels are the little “dots” that make up a digital photo. It takes many, many pixels to form a digital image, often a million or more. That’s why digital cameras are described in terms of how many millions of megapixels, or **megapixels**, they’re capable of producing.



32x12 pixel image

Resolution describes the relative number of pixels used in a photo. The fewer the number of pixels in a photo, the lower the image quality, hence, **low-resolution**. An image with a larger number of pixels, and hence a richer image quality, is described as **high-resolution**.



Akhmatova at 10 dpi (low-res)



Akhmatova at 600 dpi (high-res)

Complicating this a bit is the fact that printers and scanners don’t cooperate in measuring images in this **pixel/megapixel** scheme. Printer and scanner output is measured in dots per inch, or **DPI**. Specifically, DPI is the number of dots in a one-inch line of an image.

Greyscale is the digital word that simply means “black and white.”

INPUT	<p>In general, there are two ways to create digital images:</p> <ul style="list-style-type: none">■ via a digital camera■ via a scanner <p>In addition, you can capture digital images from webpages and store them to your computer.</p>
DIGITAL IMAGE TYPES	<p>.jpg (“jay-peg”)</p> <p>The .jpg is the most common digital image format. The images produced by your camera or scanner will produce a file ending with .jpg, just as Microsoft Word documents end with .doc.</p> <p>.gif (“jiff” or “giff”)</p> <p>The .gif is the most common image format for web pages. It compresses the image size into a smaller file that loads quickly when viewed over the Internet. If you’re creating a webpage and want to include many graphics, you may need to convert your .jpg to .gif.</p> <p>.bmp (“bitmap”)</p> <p>.Bmp is a standard Windows-based graphic format. It is not used for webpage and can possibly only be viewed by other Windows users. You probably won’t produce a .bmp, but you may receive one via e-mail from a friend.</p>

DIGITAL CAMERAS

Digital cameras work much like a standard camera but produce a digital image instead of committing the image to film.

Storage

The digital image is saved in the digital camera to a card, disc, or some other device, instead of to film. The storage card or disc can vary in size and price. Be careful to note the storage/memory size before you buy a camera. If you buy a camera with too little storage space, don't panic. You can often update the memory at a later time, often for a low price.

Transfer

When you're finished photographing or you fill up your camera's card, the camera is hooked up to your computer using the cables that come with the camera and the images are transferred from the camera to the computer. Once you set this up the first time, it's pretty easy.

Digital camera upsides:

- Digital photos can be reviewed instantly on the camera itself. You can quickly delete unwanted images and keep the good ones. This can cut printing costs significantly and reduce waste.
- Digital photos are instantly ready for computer storage, manipulation, or sending to someone via e-mail.

Downsides:

- A basic digital camera is still more expensive than a non-digital camera with similar features. This may change in a couple of years.
- Digital cameras often lack features that advanced photographers may be accustomed to.
- Digital cameras may have limited space to store high resolution pictures. The cards or discs can fill up quickly.
- Digital cameras can have a very short battery life. So quickly, in fact, that you may want to be sure to buy a rechargeable battery with your camera.

Digital cameras come in 3-,4-, or 5-megapixel models.

3-megapixel	\$200-450	Good for basic images up to 4"x6". Has basic features such as zoom and flash. Often smaller
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			and easier to carry than more advanced models. The 3-megapixel camera is good for beginners, families, etc.
4-megapixel	\$300-500		Takes larger sized images. Often offers more advanced photography features. Interface may be more complicated than a 3-megapixel camera.
5-megapixel	\$300-800+		Can take very high-resolution images. Offers all advanced features. May be much heavier and larger (clunkier!) than a 3-megapixel camera.

Consumer Reports reviews digital cameras twice a year. New, expensive models are introduced frequently at the high end of the market and as a year or so passes the price of these models drops significantly. At the low end of the market, inexpensive cameras in the \$100-200 range continue to add features found in more advanced cameras.

The most current issue of Consumer Reports is available at the front desk of the library, and back issues are available on Stack 11.

Paul's recommendation
Olympus D-560 Zoom (\pm \$225) 3-megapixels. This is the baby brother of the D-550 that the Library has used for several years. We also have this model at home and use it frequently. It takes incredibly clear, reliable shots and has a quick transfer to the computer—about 3 minutes for 125 pictures. The user interface is easy to understand and its memory is very cheap to upgrade.
Consumer Report's recommendation
Kodak EasyShare CX6330 (\pm \$200) 3-megapixel. CR's Best Buy. Has excellent print quality but low battery life. Can hold more high-resolution shots than the above model. Most reviews point to the fact that this camera lives up to its reputation of being easy to use—apparently it's the easiest to use on the market.

SCANNERS

A scanner is a computer peripheral that creates a digital image from an object placed on the scanning bed. In practical terms, it's like a photocopier that spits out a digital image to your computer instead of producing a piece of paper.



a typical **FLATBED** scanner

Scanners vary in price like digital cameras, but unlike digital cameras, they've come down in price greatly, and have stabilized at those prices. You shouldn't need to spend more than \$150 on a very high quality scanner, and an \$80 may have all the features you need.

Scanners commonly allow adjustment at the time of scanning for:

- resolution (higher resolution=larger file, slower scan)
- file type (.jpg or .gif)
- color vs. greyscale
- color adjustment

All scanner models have different usage instructions but in general:

1. Open the scanner and place the image/object face down on the scanner bed. Close the lid.
2. Open up your digital image software.
3. Select "scan image."
4. Preview and accept the image from the scanner.
5. Save the image as a file to your computer.

Slides and negatives

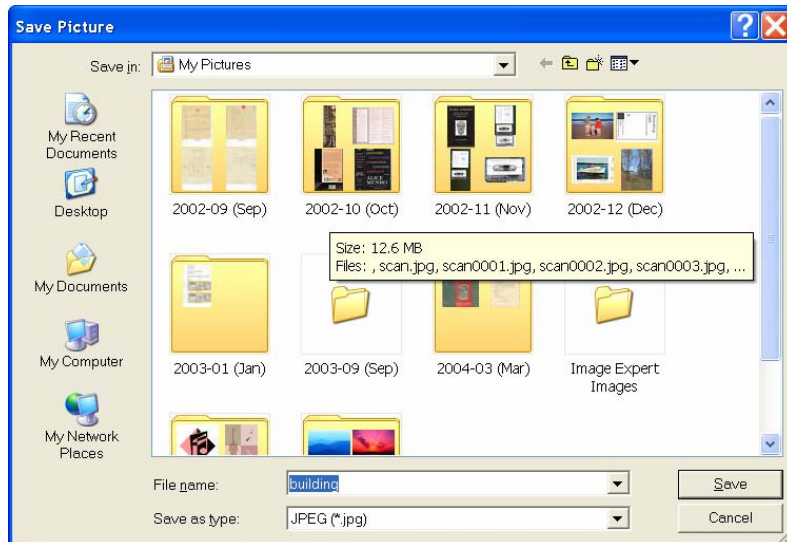
Some models can also scan from slides and negatives. In less expensive models, the slides or negative are placed inside a special adapter inside or on top of the scanner. The scanner produces an image that is usually of lower quality than scanning from a hard copy.

If you have a large number of negatives to scan, a dedicated negative scanner is available. They're more expensive than a flatbed scanner, but produce a much higher-quality image.

COPYING AN IMAGE FROM THE WEB

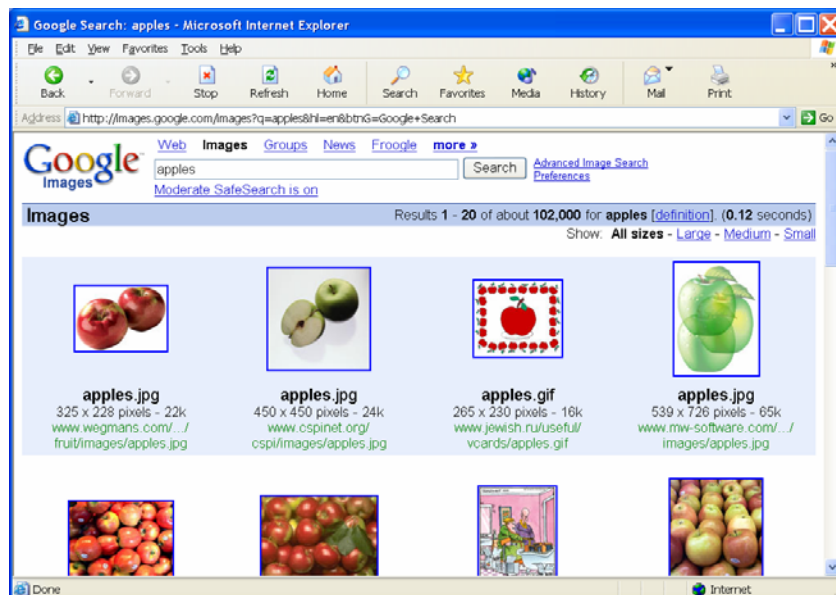
Most of the images you see on the Internet can be copied (legally or illegally) to your computer.

1. Place the cursor over the image on a webpage.
2. Click the right side of your mouse.
3. Save the image to your computer.



It's possible to search for images on the Internet much like we search for information.

Images.google.com <http://images.google.com/> is one site that allows such a search. Simply enter a search term in the box ("apple") and you'll receive a wide variety of images related to that term.



EDITING SOFTWARE

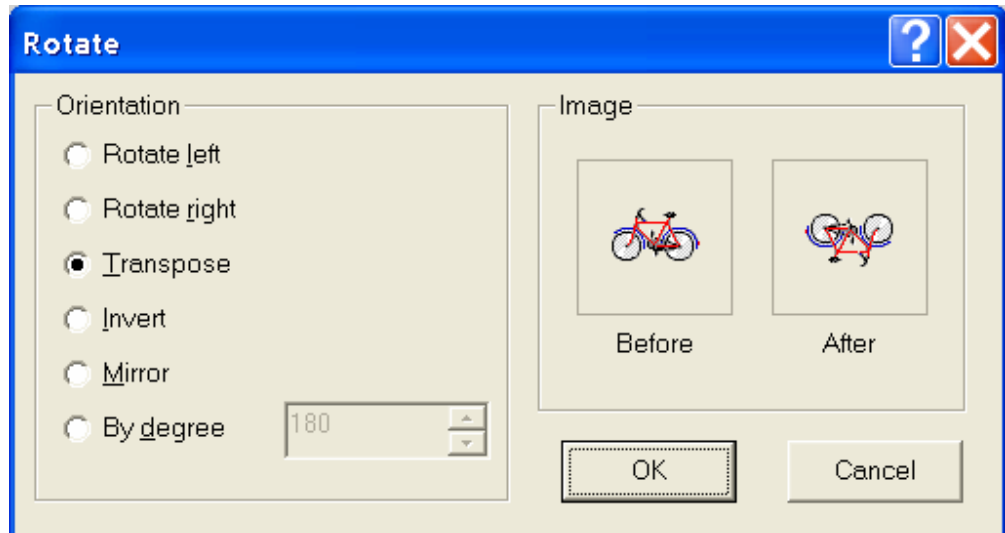
The images produced by a digital camera or scanner may need some sort of manipulation. Digital image editing software can be used for basic tasks such as resizing, rotating, removing redeye, enhancing saturation, and converting an image to grescale.

The software that comes bundled with new computers, digital cameras, and scanners can sometimes perform these very basic tasks. For more advanced photographic techniques a purchased software package may be necessary. These programs range greatly in price from \$50 for Microsoft Picture It! to \$650 for Adobe Photoshop.

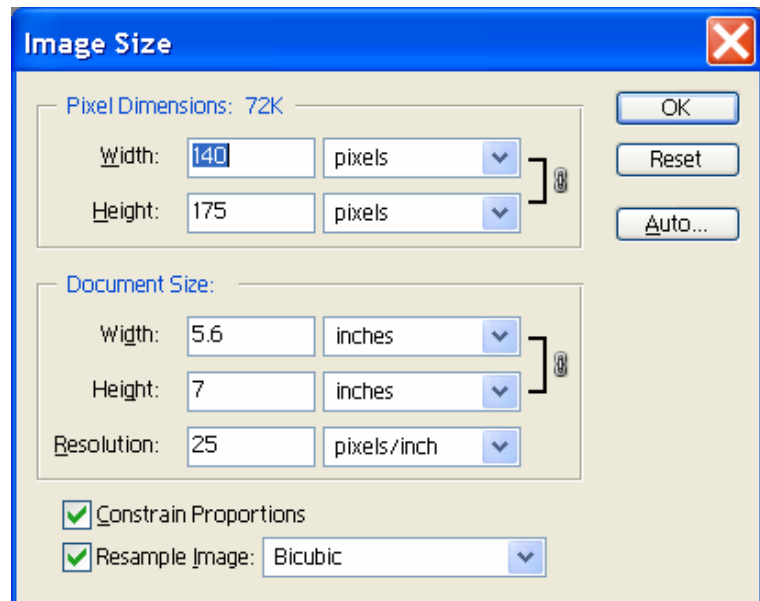
Editing programs have different features, but always begin by creating a copy of your image to protect the original. Open the image and choose "save as" to copy and save the image to disc.

Basic functions include:

Rotation



Resize image



Insert text



Greyscale



Image crop



Auto color: adjusts color balance

Auto contrast: corrects highlights and shadows



PRINTERS

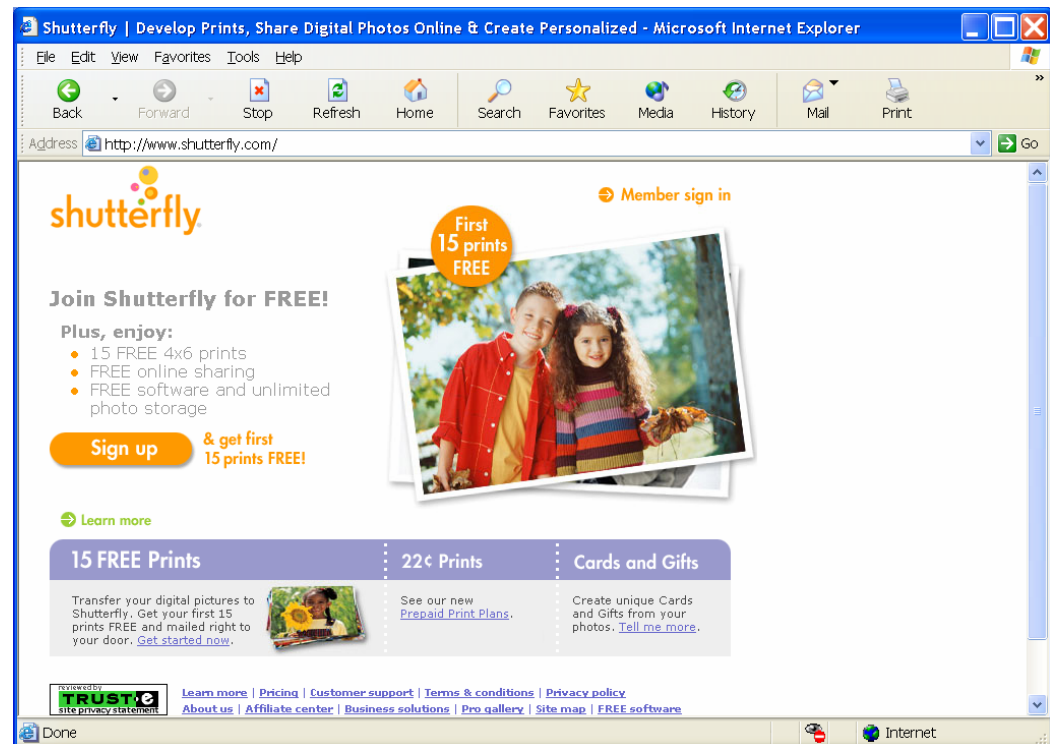
If you're equipped with a digital camera and computer it seems reasonable that you'd want to finish the project by producing your own photo prints on a printer. Unfortunately the standard inkjet printer produces a printed image that's obviously inferior to a professionally produced photo print. Some basic inkjet models produce better printed images than others. Using special (and costly) photo paper will also produce a better print.

Printers dedicated to printing photos, [photo printers](#), are available. They're more expensive than the basic inkjet printer (starting at \$200). You'll spend more time printing a photo than printing pages of text; a high-quality photo can take up to five minutes to print. In the end the quality of a photo printer print is still obviously lower than a professionally produced photo print. Also note that the longevity of a home-produced print is lower than a professionally produced print. All inkjet prints fade over time.

RECEIVING PRINTS IN THE MAIL

It is possible to send your digital images to be professionally processed into prints instead of printing them to a home printer. I recommend:

Shutterfly : <http://www.shutterfly.com/>



After registration you simply upload your digital photos to their website and the prints (4"x6", etc.) arrive in the mail a few days later.

You can also produce fully bound photography books, calendars, holiday cards, and other fun projects with Shutterfly.



**FURTHER
RESOURCES**

Microsoft Photography Glossary

<http://www.microsoft.com/windowsxp/using/digitalphotography/glossary/default.aspx>

Gives a very nice overview of the many technical terms used in digital photography.

Consumer Reports

Frequent reviews (twice yearly) of digital cameras, scanners, editing software, and printers. May 2004 had a special section on digital imaging. This issue is available on Stack 11. An upcoming issue will probably review cameras again.

Imaging Resource

<http://www.imaging-resource.com/>

A wonderful site for digital camera reviews and lots of technical information on digital photography.