

Understanding Digital Images

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Outline

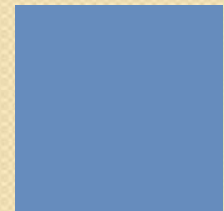
- What is a digital image?
- How do you acquire one?
- Resolution
- Image sizes for print and online viewing
- How do you detect image size/resolution
- How do you change image size/resolution



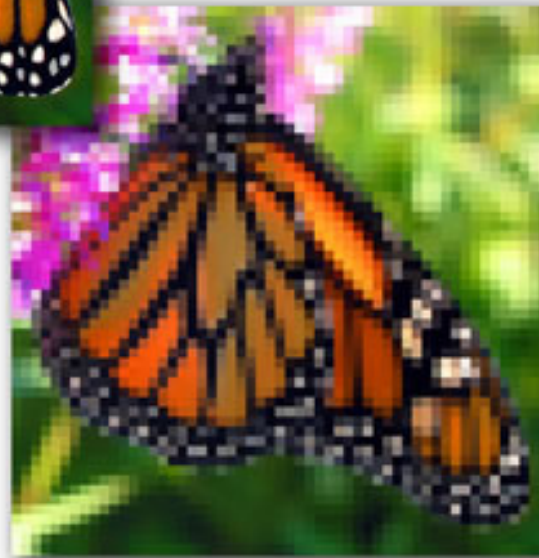
"I've just got a digital camera – would you like to see 14,000 pictures of my kids?"

DIGITAL IMAGE – WHAT IS IT?

- Pixels - Pixel is short for *Picture Element*
It's the "atom" of digital imaging: The smallest possible unit of a digital image.
 - It's two dimensional
 - It has *no* inherent height or width (it can be *any* size)
 - It has *no* inherent shape (though image editing software renders it as square)
 - It's all one color
 - It can be *any* color



Pixels combine to form images



Acquiring Digital Images

- **Scanning:** You can take pretty much any printed material and scan it to obtain a digital copy of it. Readily available scanners make scanning images on paper, printed photos, slides, and negatives a fairly simple process.
- **Digital Cameras:** Digital cameras (Figure 3) and camera phones are probably the fastest, easiest way to produce digital images.
- **Photo CDs:** You may obtain a collection of digital images from your photo processor, along with your developed prints or slides. Many photo-processing services now provide photo CDs with .jpg images on them.

Resolution

- The number of pixels used to create the image
- Usually expressed in ppi – pixels per inch
- Prints need much higher resolution to print well (200-300 ppi)
- For web or online display – 72 ppi is generally sufficient
- You may sometimes see dpi instead of ppi

Images sizes for printing

Print Size	Pixel Count	Megapixels
4 x 6	800 x 1200	1
5 x 7	1000 x 1400	1.5
8 x 10	1600 x 2000	3
11 x 14	2200 x 2800	6

Image sizes for web viewing

- An inch of resolution on paper is about 4 inches big on the screen.
- Images for web are always measured in pixels (400px x 500px)
- Monitors render images at 72 ppi
- 400px x 500px image will measure
 - $400/72 = 5.5$ in., $500/72 = 6.9$ in.

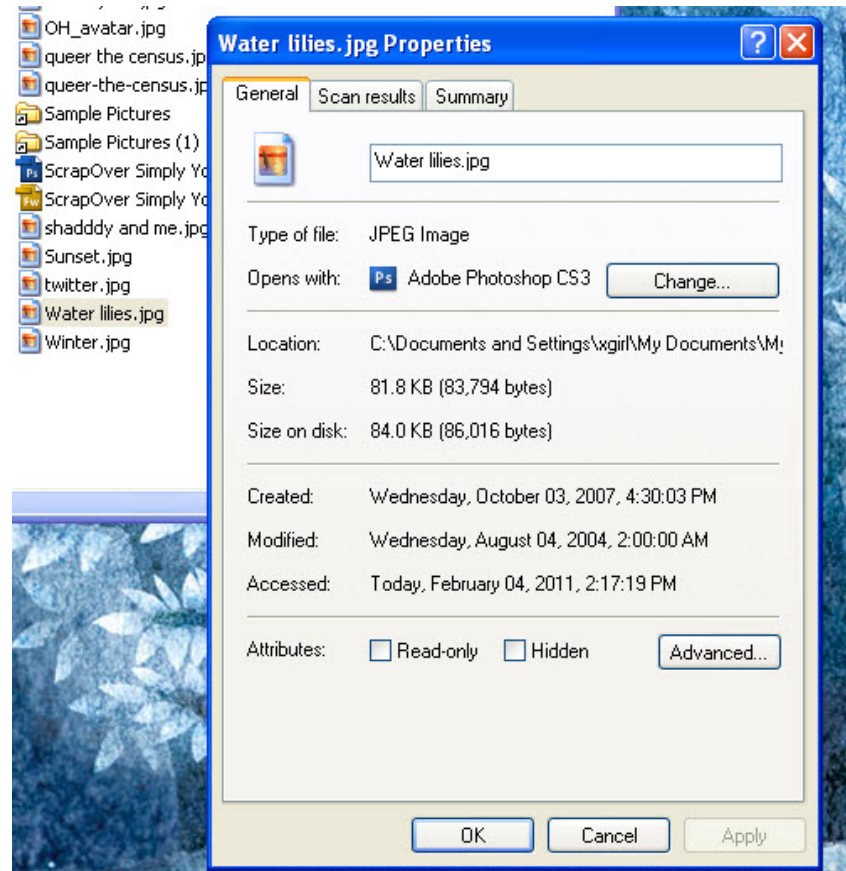
Most Common File formats

- jpg (jpeg) –
 - Most common file format
 - Compresses the image to make files significantly smaller
- tiff –
 - The leading format for files that will be used in print publications such as newsletters and magazines.
 - Preserves all image data but usually results in larger file sizes than JPEG and can't be displayed by Web browsers and e-mail programs.
- gif –
 - used for print and web.
 - are limited to 256 or fewer colors, and are not recommended for photos, but rather, images with flat fields of color, such as clip art.

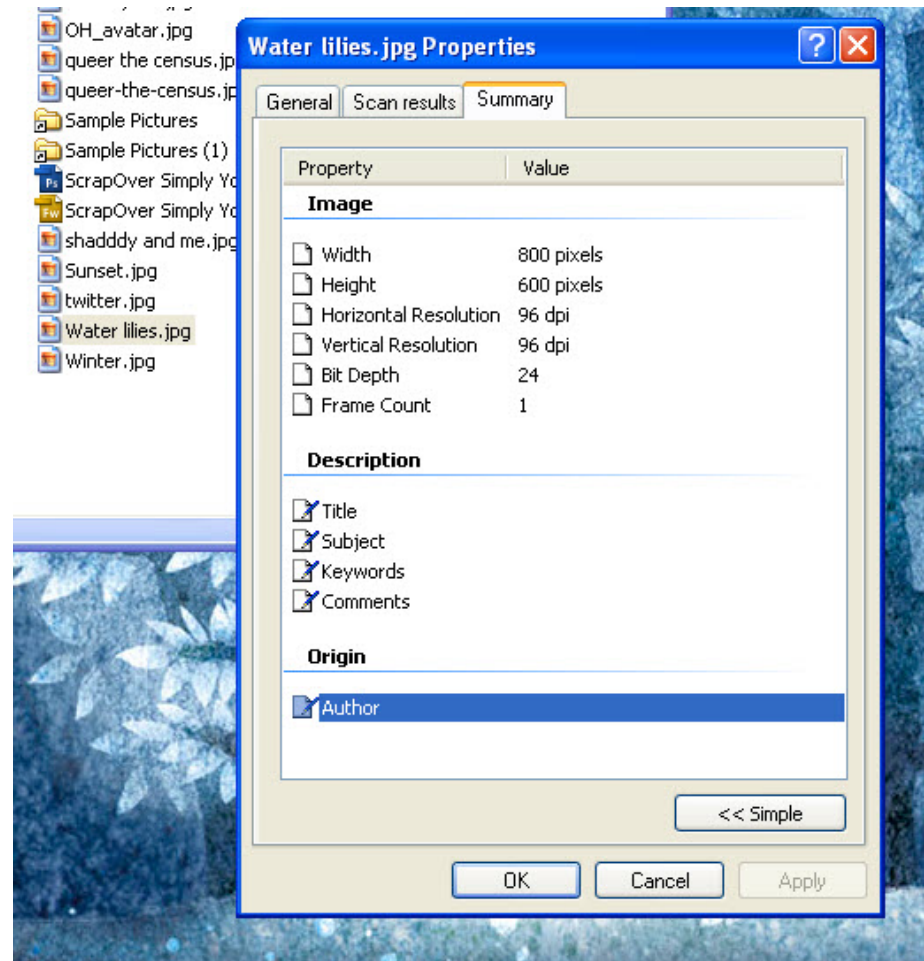
How do you know what the resolution is?

- PC - Right Click and go to “properties.” Then look at the “image” tab.
- Mac – Command Click

PC-Right Click



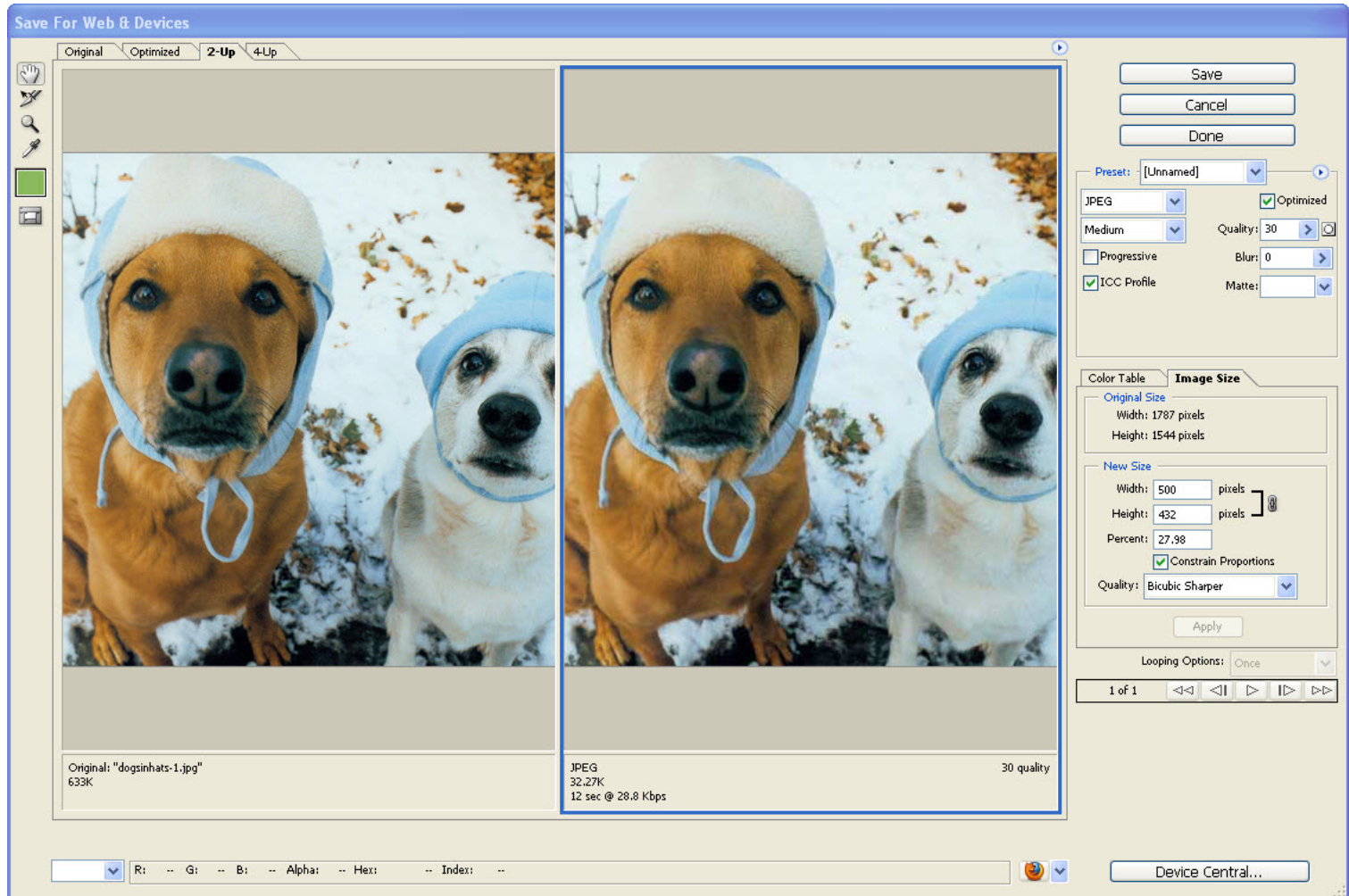
Right Click – summary tab



How do you change the resolution?

- Can never make the resolution better than the original file you have.
- You need to use a software program to “resample” the image or change the image size.
 - Photoshop
 - Photoshop Elements
 - iPhoto (mac)
 - Gimp (free open source software)
gimp.org

Photoshop –save for web



Tips

- **Always protect the original** image and work with a copy
- **Start big** – you can always reduce the size to match your needs
- **Name Files Accurately** - Develop a file naming convention that will help you accurately identify your files. Names that include descriptive information, version or size information, or intended use information can be helpful when managing large digital image collections.

Images for the PA website

- Copy files to a cd – up to 30 images
- text document with a biographical statement or
- The photos should be no smaller than 650px x 650px at a resolution of at least 72ppi. If your files are larger I can resize them, but if they're smaller than this - they will not be usable.
- The file name for each photo should be the name of the piece as you want it to appear in your gallery. For example if the title of your piece is "Mice on a Block of Cheese" your file name should be "Mice on a Block of Cheese.jpg" (without the quotation marks).