

STUDENT WORKSHOP #4

Presentation Workshop #1

This workshop is designed to introduce students to using digital technology as a way to archive and present their work. In the next sessions we will be learning about digital photography, Photoshop, Microsoft Word, PowerPoint, and Creating a CD of images and information to sent out into the world. Students should come to each session with questions and issues that they would like to discuss. The best way to understand what we cover is to try it at home! The Library has Photoshop on every computer and I am sure you can get your hands on a digital camera of some kind and do your own research.

Digital Photography / Files Formats and Sizes

The quality of a digital image is the sum of various factors. Pixel count (typically listed in megapixels, millions of pixels) is only one of the major factors, though it is the most heavily marketed. Pixel count metrics were created by the marketing organizations of digital camera manufacturers because consumers can use it to easily compare camera capabilities. It is not, however, the major factor in evaluating a digital camera. The processing system inside the camera that turns the raw data into a color-balanced and pleasing photograph is the most critical, which is why some 4+ megapixel cameras perform better than higher-end cameras.

Image resolution

This describes the detail an image holds. The term applies equally to digital images, film images, and other types of images. Higher resolution means more image detail.

Pixel resolution

The term resolution is often used as a pixel count in digital imaging. When the pixel counts are referred to as resolution, the convention is to describe the *pixel resolution* with the set of two positive integer numbers, where the first number is the number of pixel columns (width) and the second is the number of pixel rows (height), for example as *640 by 480*. Another popular convention is to cite resolution as the total number of pixels in the image, typically given as number of megapixels, which can be calculated by multiplying pixel columns by pixel rows and dividing by one million.

- A **Megapixel** is 1 million pixels, and is a term used not only for the number of pixels in an image, but also to express the number of sensor elements of digital cameras or the number of display elements of digital displays. For example, a camera with an array of 2048x1536 sensor elements is commonly said to have "3.1 megapixels" ($2048 \times 1536 = 3,145,728$).

- **Pixels per inch (PPI)** is a measurement of the resolution of a computer display, related to the size of the display in inches and the total number of pixels in the horizontal and vertical directions.
- **Dots per inch (DPI)** is a measure of printing resolution, in particular the number of individual dots of ink a printer or toner can produce within a linear one-inch (2.54 cm) space.

JPEG/TIFF/RAW

These are terms used to talk about image compression and file formats in relation to digital photography and image editing.

- **JPEG** is probably the most common file format and the one you hear of most. The JPEG standard specifies and defines how an image is compressed into a stream of bytes and decompressed back into an image, and the file format used to contain that stream. The compression method is usually lossy compression, meaning that some visual quality is lost in the process. You can use the JPEG format but the term lossy refers to the fact that every time you open and close a JPEG file you lose some information. JPEGs are usually used to save images that will be used on the web since the file sizes are usually small and image quality is not as important.
- **TIFF** files are larger than JPEG files, but they retain the full quality of the image. They can be compressed or uncompressed, but the compression scheme is lossless, meaning that although the file gets a little smaller, no information is lost.
- The contents of **RAW** files include more information, and potentially higher quality. Each pixel in a raw file has a greater bit-depth (compared to typical 8-bit renderings), and can thus store more subtle variations and range in color and detail. Hence, large transformations of the data, such as increasing the exposure of a dramatically under-exposed photo, result in less visible artifacts when done from raw data than when done from already rendered image files. Raw data leaves more scope for both corrections and artistic manipulations, without resulting in images with visible flaws.

The main reason to shoot JPEG is that you get more shots on a memory card and it's faster, both in camera and afterwards. If you shoot RAW files you have to then convert them to TIFF or JPEG on a PC before you can view or print them. You shoot RAW when you expect to have to do some post exposure processing and are interested in retaining as much visual information as possible.