

# Digital Photography

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Learn to use digital cameras and work with digital images. This class will focus on the basic operations of a digital camera, taking good photos, and using basic Windows software to edit digital images. Integrate the use of digital cameras into your instruction.

## Composition:

### Ten Tips for Good Pictures:

- Get down to their level
- Use a plain background
- Use flash outdoors
- Move in close
- Move it from the middle
- Lock the focus
- Know your flash's range
- Watch the light
- Take some vertical pictures
- Be a picture director

Go to the following web site to learn about these tips:

[http://www.kodak.com/eknec/PageQuerier.jhtml?pq-path=38/39/317&pq-locale=en\\_US](http://www.kodak.com/eknec/PageQuerier.jhtml?pq-path=38/39/317&pq-locale=en_US)

### Physical factors to consider when taking great photographs:

- Sunlight
- Cloudy/Overcast
- Night-time Photos
- Golden Hour
- Flash
- Red-eye
- Rule of Thirds
- Camera Positioning
- Using Lines
- Background

Here are a couple of sites that will demonstrate how to use these factors to your benefit..

Go to this website and click on **Continue** under **Simple tips for taking better photos**.

[http://www.hp.com/united-states/consumer/digital\\_photography/tours/beginners/index.html](http://www.hp.com/united-states/consumer/digital_photography/tours/beginners/index.html)

Click here for another example of the rule of thirds: <http://tlc.ousd.k12.ca.us/~acody/digi4.html>

## Camera Settings

A **pixel** (picture element) is the smallest piece of information in an image. Pixels are normally arranged in a regular 2-dimensional grid, and are often represented using dots or squares. The measures dots per inch (dpi) and pixels per inch (ppi) are sometimes used interchangeably, but have distinct meanings especially in the printer field.

### Pixel resolution

Resolution is often referred to by the number of pixel columns (width) and rows (height) eg. 640 by 480. Another convention is to refer to total number of pixels in an image (megapixels) eg. (1280 X 1024) / 1,000,000 = 1.3 Megs. Resolution is also described by pixels per inch or square inch.

**PPI** stands for "Pixels per inch" and is almost exclusively used for *printing*, not video display. If you take an image that is 800 pixels wide and 600 pixels high, and you print it with a PPI setting of 100 pixels per inch, the print will be 8 inches wide by 6 inches high. If you print at 200 PPI you get a print 4" wide by 3" high. Now the print at 200 PPI will be higher in quality but smaller. Most people seem to agree that around 320 PPI is the highest number you really need. Above that it's very hard to see any improvement in image quality. 240 PPI is

often used and even that is often regarded as high quality. Most people notice a quality drop when they go below 180 PPI.

#### 240-ppi printer resolution

#### 300-ppi printer resolution

Megapixel camera	Photo Pixel Count Maximum Setting	Printer Resolution	Print Size
1	960 x 1280	240 PPI	4 x 5.3
2	1200 x 1600	240 PPI	5 x 6.7
3	1536 x 2048	240 PPI	6.4 x 8.5
4	1704 x 2272	240 PPI	7.1 x 9.5
5	1944 x 2592	240 PPI	8.1 x 10.8
7	2304 x 3072	240 PPI	9.6 x 12.8
8	2448 x 3264	240 PPI	10.2 x 13.6

Megapixel camera	Photo Pixel Count Maximum Setting	Printer Resolution	Print Size
1	960 x 1280	240 PPI	3.2 x 4.3
2	1200 x 1600	300 PPI	4.0 x 5.3
3	1536 x 2048	300 PPI	5.1 x 6.8
4	1704 x 2272	300 PPI	5.7 x 7.6
5	1944 x 2592	300 PPI	6.5 x 8.6
7	2304 x 3072	300 PPI	7.7 x 10.2
8	2448 x 3264	300 PPI	8.2 x 10.9

**White Balance:** White balance (WB) is the process of removing unrealistic color casts so that objects which appear white in person are rendered white in your photo. Most digital cameras contain a variety of preset white balances.

**Sensitivity (ISO):** ISO is the number indicating a digital camera sensor's sensitivity to light. The higher the sensitivity, the less light is needed to make an exposure. However, the higher the ISO the more "noise" associated with the picture.

**Digital Zoom VS Optical Zoom:** Most cameras have both optical zoom and digital zoom. Optical zoom works just like a zoom lens on a film camera. The lens changes focal length and magnification as it is zoomed. Image quality stays high throughout the zoom range. Digital zoom simply crops the image to a smaller size, then enlarges the cropped portion to fill the frame again. Digital zoom results in a significant loss of quality

#### Image Formats:

**JPEG:** is a commonly used method of compression for photographic images. The degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality. JPEG typically achieves 10 to 1 compression with little perceivable loss in image quality

**TIFF:** image files optionally use LZW lossless compression. Lossless means there is no quality loss due to compression. Lossless guarantees that you can always read back exactly what you thought you saved, bit-for-bit identical, without data corruption

**RAW:** contains minimally processed data from the image sensor of a digital camera or image scanner. Sometimes called a digital negative

**Memory** (see web example)

#### Digital Camera Interface

**USB 2.0** - A development of USB but much faster - up to 480 megabits/second.

**IEEE 1394 (Firewire)** - Though this is an older interface than USB, it's capable of high speed transfer (400 megabits/second) and it's now found on some PCs or it can be added to them via a plug-in card. It is more common on digital video cameras than still digital cameras.

**Card Reader:** sometimes its easier to remove the memory card from the camera and insert it into a dedicated card reader.

The following websites describe the terms above:

<http://photo.net/equipment/digital/basics/>

<http://www.microsoft.com/windowsxp/using/digitalphotography/learnmore/bestquality.msp>

## Camera Controls:

Let's look at the CyberShot: [http://www.steves-digicams.com/2007\\_reviews/sony\\_S650.html](http://www.steves-digicams.com/2007_reviews/sony_S650.html)

## Are you ready to take pictures?

Remember, If the camera has the storage space take "BIG" pictures. This gives you the flexibility of emailing them to all the staff at your school (probably not a good idea), or printing a 10 by 13 to hang on the wall.

**Your Assignment:** (This idea is from Ms. Garland, a math teacher at the Ninth Grade.)

[Geometric Shapes in Your World](#)

----- **GO Forth and Photograph** -----

## Downloading Pictures:

Microsoft Camera and Scanner Wizard

[Downloading Pictures From Your Camera](#)

## Editing :

[Microsoft Office Picture Manager](#)

Microsoft Photo Editor

## Upgrading our project to Full Digital:

We still use one of the programs below to display our pictures with their descriptions.

### Microsoft Photo Story:

[Quick and Easy Photo Story](#)

### Microsoft PowerPoint Photo Gallery:

[Instruction Sheet for PP Photo Album](#)

### Microsoft FrontPage Photo Gallery:

Folder with pictures must be saved in your website folder.

[Instruction Sheet for FrontPage Photo Gallery](#)

- Use of photos of students on websites - how to tell if photo release has been given in SASI
- Copyright (ethical/legal use of images from the Internet, images that are scanned from printed material, or images taken by others)
- Teaching with digital images - ideas for using them in instruction