

TO: TC 310 Students
 FROM: Dr. Turns
 RE: Materials for Photoshop Class
 DATE: 18 October 2001 (Thursday)

Plan:

Topics	Learning Strategy
0. Getting Acquainted (from Tuesday)	Tutorials
1. Conceptual Basics <ul style="list-style-type: none"> • Pixels, Resolution, Screen Size, Printed Size, File Size (see definitions, next page) • File formats and image compression <ul style="list-style-type: none"> ○ JPEG ○ GIF ○ ... 	Conceptual Issues “Lecture”
2. Program Basics <ul style="list-style-type: none"> • Selection tools • Drawing tools • Layers • “Windows” 	Explore Menus
3. Exploring Specific Capabilities <ol style="list-style-type: none"> 1. Layer Mask 2. Type tool 3. Image filters 4. Eyedropper tool/ stamp tool 5. Channels and colors 6. Layer effects / Layer Options 7. “Painting” tools (bucket, air brush, etc) 	Learning by <u>doing</u> , exploration <u>Divide</u> and conquer Learn by <u>teaching</u> Task: Each team (DIVIDE) <ul style="list-style-type: none"> • DO: Explore the functionality of the assigned element • DO: Identify 3+ ways this might be used in designing web/print • TEACH: Demonstrate functionality and uses to class
4. Graphics for Web/Print: <ul style="list-style-type: none"> • Design issues: <ul style="list-style-type: none"> ○ In each case, what issues should you take into account? ○ How to address issues in design? 	Design-driven learning (Discussion)

<p>5. Resources</p> <p>Tutorials</p> <ul style="list-style-type: none"> • www.phong.com • www.adobe.com • www.the-internet-eye.com • www.webmonkey.com/design/graphics • Others? <p>Short Courses</p> <ul style="list-style-type: none"> • Graphics for the Web, UW-CTLT Short Course, http://depts.washington.edu/ctlstaf/gw <p>Image Archives</p> <ul style="list-style-type: none"> • http://elib.cs.berkeley.edu/photos/about.shtml • http://www.artofgregmartin.com • http://dgl.microsoft.com/mgo1en/eula.asp • Others • 	<p>Tutorials</p> <p>Formal Training</p> <p>Playing!</p>
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DEFINITIONS (From the web encyclopedia at, <http://www.pcwebopedia.com/>)

Pixel

Short for Picture Element, a pixel is a single point in a graphic image. Graphics monitors display pictures by dividing the display screen into thousands (or millions) of pixels, arranged in rows and columns. The pixels are so close together that they appear connected.

The number of bits used to represent each pixel determines how many colors or shades of gray can be displayed. For example, in 8-bit color mode, the color monitor uses 8 bits for each pixel, making it possible to display 2 to the 8th power (256) different colors or shades of gray.

On color monitors, each pixel is actually composed of three dots -- a red, a blue, and a green one. Ideally, the three dots should all converge at the same point, but all monitors have some convergence error that can make color pixels appear fuzzy.

The quality of a display system largely depends on its resolution, how many pixels it can display, and how many bits are used to represent each pixel. VGA systems display 640 by 480, or about 300,000 pixels. In contrast, SVGA systems display 800 by 600, or 480,000 pixels. True Color systems use 24 bits per pixel, allowing them to display more than 16 million different colors.

Resolution

Refers to the sharpness and clarity of an image. The term is most often used to describe monitors, printers, and bit-mapped graphic images. In the case of dot-matrix and laser printers, the resolution indicates the number of dots per inch. For example, a 300-dpi (dots per inch) printer is one that is capable of printing 300 distinct dots in a line 1 inch long. This means it can print 90,000 dots per square inch.

For graphics monitors, the screen resolution signifies the number of dots (pixels) on the entire screen. For example, a 640-by-480 pixel screen is capable of displaying 640 distinct dots on each of 480 lines, or about 300,000 pixels. This translates into different dpi measurements depending on the size of the screen. For example, a 15-inch VGA monitor (640x480) displays about 50 dots per inch.

Printers, monitors, scanners, and other I/O devices are often classified as high resolution, medium resolution, or low resolution. The actual resolution ranges for each of these grades is constantly shifting as the technology improves.

GRAPHICS FILE FORMATS AND COMPRESSION (adapted from the web encyclopedia at, <http://www.pcwebopedia.com/>)

- **BITMAP (.bmp):** A representation, consisting of rows and columns of dots, of a graphics image in computer memory. The file format .bmp refers to a format that stores the image as the entire series of dots (i.e., no compression).

Bit-mapped graphics are often referred to as raster graphics. The other method for representing images is known as vector graphics or object-oriented graphics. With vector graphics, images are represented as mathematical formulas that define all the shapes in the image. Vector graphics are more flexible than bit-mapped graphics because they look the same even when you scale them to different sizes. In contrast, bit-mapped graphics become ragged when you shrink or enlarge them.
- **JPEG (.jpg):** Short for Joint Photographic Experts Group, and pronounced jay-peg. JPEG is a lossy compression technique for color images. Although it can reduce files sizes to about 5% of their normal size, some detail is lost in the compression.

Lossy compression: Refers to data compression techniques in which some amount of data is lost. Lossy compression technologies attempt to eliminate redundant or unnecessary information. Most video compression technologies, such as MPEG, use a lossy technique.
- **GIF (.gif):** Pronounced jiff or giff (hard g) stands for graphics interchange format, a bit-mapped graphics file format used by the World Wide Web, CompuServe and many BBSs. GIF supports color and various resolutions. It also includes data compression, making it especially effective for scanned photos.