

week::seven

Web Imagery

Medium: The Computer Monitor

- Uses RGB (Red, Green, Blue) to create images on screen.
- Uses **additive color model**:
 - All three colors add up to be white.
 - Generates its own light (opposed to print which uses reflected light).
- Base unit is a pixel.
- The color of a pixel is represented in the computer as a series of bits.
 - The number of bits determines the number of possible colors that can be displayed at one time.
- More bits == more simultaneous colors.
- Why do we care about color depth?
 - Unlike print, we do not control the medium that our work will be displayed on.
- Color Depth Chart:

Color Depth	Number of Simultaneous Colors
24 bit	16,777,216 colors (Millions or True Color)
16 bit	65,536 colors (Thousands or High Color)
8 bit	256 colors

Content: Raster Images

- Like monitors, the **base unit is a pixel** (not inches or centimeters).
- More bits == more simultaneous colors == **larger file size**.
- Primary Types:
 - **RGB** Maximum of 16,777,216 colors
 - **Index** Maximum of 256 colors
- Color Depth Chart:

	Color Depth	Maximum Number of Colors	Image Size
RGB Images	32 bit	16,777,216 colors with an 8-bit channel for transparency (the alpha channel)	157K
	24 bit	16,777,216 colors (Millions or True Color)	118k
	16 bit	65,536 colors (Thousands or High Color)	79k
Index Images	8 bit	256 colors	39k
	6 bit	64 colors	29.4k
	4 bit	16 colors	19.6k
	2 bit	4 colors	9.8k
	1 bit	2 colors	4.9k

Color depth equation: 2 to the nth power, where n is the number of bits ($2^6 = 64$; $2^{16} = 65536$).
Image size is based on a white 200 x 200 pixel image without compression.

Web Imagery Characteristics

Size Measurement

- An image used on the web is always measured in **pixels**, not in inches or picas like print.
- **Image resolution on the web is 1:1**—every pixel in an image is displayed.
 - While it is possible to scale an image larger or smaller within Dreamweaver, the resulting image usually appears coarse and pixilated. Don't do it.
- In Photoshop, always work at a magnification of 100% (Command-1).
 - This will display the imagery exactly how it will appear on the web, ensuring that you see every pixel in your document.
- When creating web graphics with fonts in Photoshop, be sure to set your image pixels per inch (PPI) setting to 72. This will allow you to use familiar font sizes in Photoshop.
 - For example, if your image PPI is set to 36, a font point size of 12 will appear half the size you intended within Photoshop.

File Size

- Compared to print, web images are smaller and easier to work with.
- However, all images bound for the web require **optimization**.
- Optimization tweaks the image to reduce its file size, which helps reduce image download times.
- How does optimization make an image smaller?
 - Removes unwanted colors (GIF, PNG)
 - Removes non-essential visual data (lossy compression; JPEG, PNG)
 - Removes embedded previews, thumbnails, icons and metadata (not always a good thing—think copyright information).
 - **Compresses** the image (through JPEG, GIF and PNG file types)

Formats

- Either **JPEG, GIF, or PNG**.
- Which one you choose depends on a number of factors...

PNG Images

Features

- PNG (Portable Network Graphics) is an emerging file format that combines the best of the JPEG and GIF into one open format.
- Supports precise color selection and loss-less compression (like GIF).
- Supports 24-bit color (like JPEG), though not lossy compression.
- Provides excellent **8-bit transparency support**.
- Is an open format—no one company owns the technology behind PNG.

Use

- **PNG-8** mimics the GIF file format.
- **PNG-24** is like GIF (non-lossy compression), but with 24-bit color support.

Good for:

- Any image that you would have saved as a GIF image.
- Images that have 8-bit transparency (like in Photoshop).

Bad for:

- Images that contain photographic information only.
- Internet Explorer for Windows 6.0 and earlier users (IE 7 and above are OK).

GIF Images

Description

- Limited to a maximum of 256 colors.
- Uses compression to reduce image size.

Features

- **LZW Compression**
 - Is a loss-less method of compression, meaning that the pixel data is unaltered when compressed.
 - Works especially well on large areas of continuous color.
- **Transparency**
 - Colors in the CLUT can be set as transparent. This affects all occurrences of a color.
 - GIF uses a simple 1-bit transparency: A color is either transparent or opaque.
- **Color Look-Up Table**
 - Contains all of the colors (up to 256) available for a particular GIF image.
 - Reducing the number of colors in the CLUT reduces the image size.
- Simple Cell-based **Animations**

Optimizing Tips

- Always try to use as few colors as you can when saving a GIF. Experiment by trying various color depths and previewing them in the Optimize window in the Photoshop *Save for Web and Devices...* menu.
- When optimizing anti-aliased artwork, like text or vector graphics, you need at least **8 colors** per color transition to create a smooth appearance.
- When using anti-aliasing, you must matte your image to the same background color you intend to use in the web page.

Good for:


- Navigation elements
- Type as a graphic, with or without anti-aliasing
- Images with sharp edges or fine detail
- Images requiring transparency
- Images with a large area of a single color
- Animations

Bad for:

- Photographs
- Any image with more than 256 colors

Examples

- Note how the GIF image is not only perfect in appearance but is actually smaller in file size as well. (Images are enlarged 250%)

			
Photoshop Image 24-bit uncompressed 4,000 bytes	GIF Image 8 colors 257 bytes	JPEG Image 80% quality 1,538 bytes	JPEG 30% quality 825 bytes

JPEG Images

Description

- Can display millions of colors (True-color, 24 bit image).
- Designed from the beginning for photos.

Features

- **Excellent Compression**
 - Compression is "lossy", resulting in JPEG artifacts.
 - JPEG reorganizes an image's pixels to reduce file size.
 - JPEG offers selectable levels of compression:

Save for Web	0%	-----	50%	-----	100%
Photoshop	0	-----	5	-----	10
			small size		large size
			poor quality		perfect quality
 - Done correctly, these artifacts are only visible when the image is magnified.
- **True-Color Support**
 - JPEGs support millions of colors (24 bit).

Optimizing Tips

- Save photos for the web between the **60% to 80%** quality levels.
- Always save your original Photoshop files. Once an image is compressed using JPEG, you cannot revert to a previous, superior quality level without the original, uncompressed image.
- While it is possible to save CMYK images in JPEG format, don't use them. They are bigger than RGB versions and don't display in most browsers.

Good for:

- Photographs
- Any image requiring more than 256 colors
- Complex imagery with soft edges

Bad for:

- Animations
- Images requiring transparency
- Most navigation elements
- Images that need to be "pixel-perfect"

Example

- The 80% quality JPEG is much smaller in file size and displays the full range of color, making it a better choice than the 256-color GIF image.

