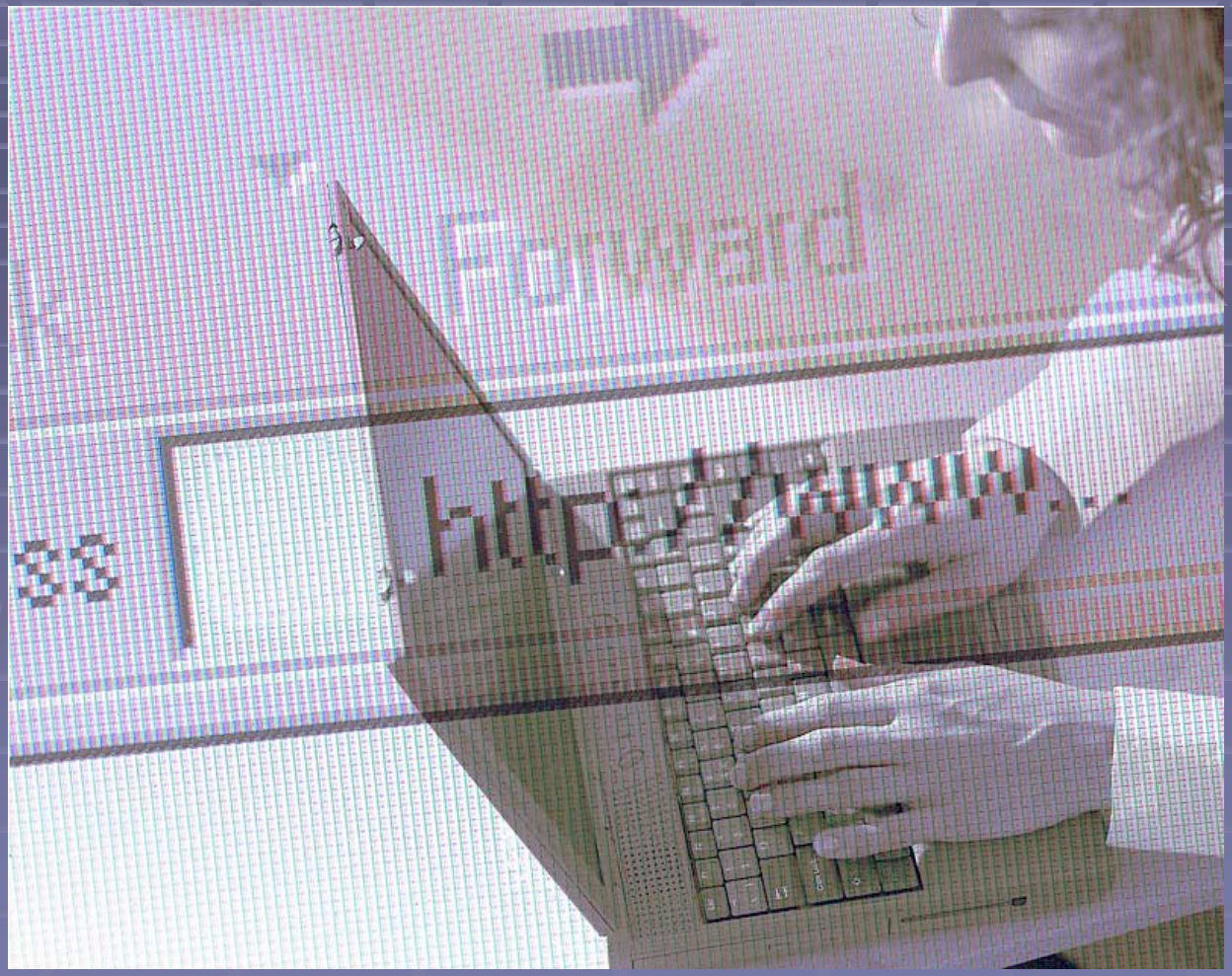
How Websites Work



An Overview of Web Development
(part 2)

Overview continued…

Last week we spoke about:

- What's the difference between the term "internet" and "world wide web"?
- Choosing a domain name and registration
- Web hosting
- Uploading/downloading files

This week we continue and will discuss:

- HTML, XHTML, & CSS
- Web browsers
- Web design software options
- Using graphics, type, and multimedia
- Site architecture
- File management

What is HTML?

HTML (HyperText Markup Language), is the coding language used to create web pages for the World Wide Web.

In HTML, a block of text can be surrounded with tags that indicate how it should appear (for example, in bold face or italics).

Also, in HTML a word, a block of text, or an image can be linked (hyperlinked) to another file on the Web.

HTML files are viewed with a World Wide Web (web page) browser.

What is XHTML?

XHTML is the next generation of HTML and is a hybrid between HTML and XML.

XML was designed to describe data. HTML was designed to display data.

XHTML is much stricter than HTML and therefore more consistently translated by different browsers.

For further information see:
http://www.w3c.org/MarkUp/

The history of HTML:

The history of HTML at W3C starts with HTML 3.2, code named Wilbur, which was followed a few years later by HTML 4.0, then HTML 4.01.

HTML 4.01 is the last version of HTML, and is also the final W3C specification to define the semantics of markup.

From HTML 3.2 to HTML 4.01, the language has improved a great deal, focusing on such issues as:

* Separation of presentation from structure
* Improved accessibility features
* Improve internationalization features
* Improved document rendering

HTML vs. XHTML

XHTML is not very different from the HTML 4.01 standard.

You should start NOW to write your HTML code in lowercase letters, and NEVER skip ending tags (like </p>).

The Most Important Differences in using XHTML are:

* XHTML elements must be properly nested
* XHTML elements must always be closed
* XHTML elements must be in lowercase
* XHTML documents must have one root element (nested within the <html></html> elements)

HTML vs. XHTML

XHTML is now the standard markup language for web documents and the successor to HTML 4.

If you want your site to work well in today's browsers and non-traditional devices, and to continue to work well in tomorrow's, it's a good idea to author new sites in XHTML, and to convert old pages to XHTML.

What is CSS?

* CSS stands for Cascading Style Sheets
* Styles define how to display HTML elements
* Styles are normally stored in Style Sheets
* Styles were added to HTML 4.0 to solve a problem
* External Style Sheets can save you a lot of work
* External Style Sheets are stored in CSS files
* Multiple style definitions will cascade into one

Why was CSS added to the use of to HTML?

Styles Solve a Common Problem

HTML tags were originally designed to define the content of a document.

They were supposed to say "This is a header", "This is a paragraph", "This is a table", by using tags like <h1>, <p>, <table>, and so on.

The layout of the document was supposed to be taken care of by the browser, without using any formatting tags.

Why was CSS added to the use of to HTML?

To solve this problem, the World Wide Web Consortium (W3C - http://www.w3schools.org) - the non profit, standard setting consortium, responsible for standardizing HTML - created CSS in addition to HTML 4.0.

All major browsers support Cascading Style Sheets.

Style sheets save a lot of time!

Styles sheets define *HOW* HTML elements are to be displayed, just like the font tag and the color attribute in HTML 3.2.

Styles are normally saved in external .css files.

External style sheets enable you to change the appearance and layout of all the pages in your Web, just by editing one single CSS document!

Read more about HTML, HTML, XHTML and CSS…

http://www.w3schools.com

What is a web browser?

A web browser is a software application that enables a user to display and interact with text, images, videos, music and other information typically located on a Web page at a website on the World Wide Web or a local area network.

Text and images on a Web page can contain hyperlinks to other Web pages at the same or different website.

Web browsers allow a user to quickly and easily access information provided on many Web pages at many websites by traversing these links.

How web browsers work…

Web browsers format HTML information for display, so the appearance of a Web page may differ between browsers.

Some of the Web browsers available for personal computers include Internet Explorer, Mozilla/Firefox, Safari, Opera, and Netscape

How web browsers work…

Web browsers are the most commonly used type of HTTP (Hypertext Transfer Protocol) user agent.

Although browsers are typically used to access the World Wide Web, they can also be used to access information provided by Web servers in private networks or content in file systems.

How web browsers work…

Web browsers communicate with Web servers primarily using HTTP (hypertext transfer protocol) to fetch web pages.

HTTP allows Web browsers to submit information to Web servers as well as fetch Web pages from them.

Pages are located by means of a URL (uniform resource locator), which is treated as an address, beginning with http: for HTTP access.

How web browsers work…

The file format for a Web page is usually HTML (hyper-text markup language).

Most browsers natively support a variety of formats in addition to HTML, such as the JPG, PNG and GIF image formats, and can be extended to support more through the use of plugins.

The combination of HTTP content type and URL protocol specification allows Web page designers to embed images, animations, video, sound, and streaming media into a Web page.

Most Popular Web Browsers

As of July 2007:

Internet Explorer 36.9%

Firefox 34.5%

Mozilla/Netscape 1.4%

Safari 1.5%

Opera 1.9%

(Balance is mostly older versions of assorted browsers)

Cross-platform issues: browser variations

Every Web browser interprets HTML and CSS tags a little differently.

Tables, forms, and graphic positioning and alignment tags will all work a bit differently in each brand or operating system version of Web browser.

These subtleties normally pass unnoticed, but in very precise or complex Web page layouts they can lead to nasty surprises.

Cross-platform issues: browser variations

Never trust the implementation of HTML, CSS, JavaScript, Java, or any plug-in architecture until you have seen your Web pages displayed and working reliably in each brand of browser.

If significant numbers of your readers are using the Macintosh, Linux, or UNIX operating systems, you should also test your more complex pages and programming functionality in those operating systems.

Unfortunately, platform-specific bugs remain common in the major Web browsers.

Web design software options:

When building a Web page, you might think that it really isn't important what editor you use.

You can write HTML in MS NotePad or you can use the tools on your hosting provider.

HTML editors come in two flavors: text editors and "what you see is what you get" (WYSIWYG) editors.

Your choice of editor will be influenced by what you want to do.

HTML editors range in price from free to several hundred dollars.

There are good editors in every price range.

Text HTML editors:

An HTML editor is a software application for creating web pages. Although the HTML markup of a web page can be written with any text editor, specialized HTML editors can offer convenience and added functionality.

For example, many HTML editors work not only with HTML, but also with related technologies such as CSS, XML and JavaScript, etc.

Text (source) editors intended for use with HTML usually provide syntax highlighting. Templates, toolbars and keyboard shortcuts may quickly insert common HTML elements and structures.

Wizards, tooltip prompts and auto-completion may help with common tasks.

WYSIWYG editors:

WYSIWYG (What You See Is What You Get) HTML editors provide an editing interface which resembles how the page will be displayed in a web browser.

Because using a WYSIWYG editor does not require any HTML knowledge, they are easier for an average computer user to get started with.

While WYSIWYG editors make web design faster and easier; many professionals still use text editors, despite the fact that most WYSIWYG editors have a mode to edit HTML code by hand.

WYSIWYG & Text editors:

Popular WYSIWYG editors:

Adobe Dreamweaver CS3
Macromedia Dreamweaver (earlier versions)
MS FrontPage
GoLive (now discontinued)

Text editors:

NotePad (installed on Windows computers)
Macromedia Homesite
Bbedit (mac)
NoteTab

Free! Web Design Software

http://www.coffeecup.com/freestuff/

http://www.download.com

http://www.tucows.com

Web graphics:

Images on the monitor screen

The primary challenge in creating images for Web pages is the relatively low resolution of the computer screen.

But today's computer screens can display thousands or millions of colors, and this wealth of color minimizes the limitations of screen resolution.

Complex graphics or color photographs often look surprisingly good on Web pages for two reasons:

Web graphics:

Images on the screen

True-color (24-bit) or high-color (16-bit) displays show enough colors to reproduce photographs and complex art accurately.

The light transmitted from display monitors shows more dynamic range and color intensity than light reflected from printed pages

Digital publishing is color publishing: on the Web there is no economic penalty for publishing in color. Web pages may in fact be the best current means of distributing color photography — it's a lot cheaper than color printing, and it's also more consistent and reliable than all but the most expert (and costly) color printing.

Web graphics:

The screen versus printed color artwork

Relative to printed pages the computer screen is a low-resolution medium.

When you look at illustrations, photographs, and other sophisticated imagery, however, the differences in quality between conventional four-color printing and the computer screen are not as great as you might expect.

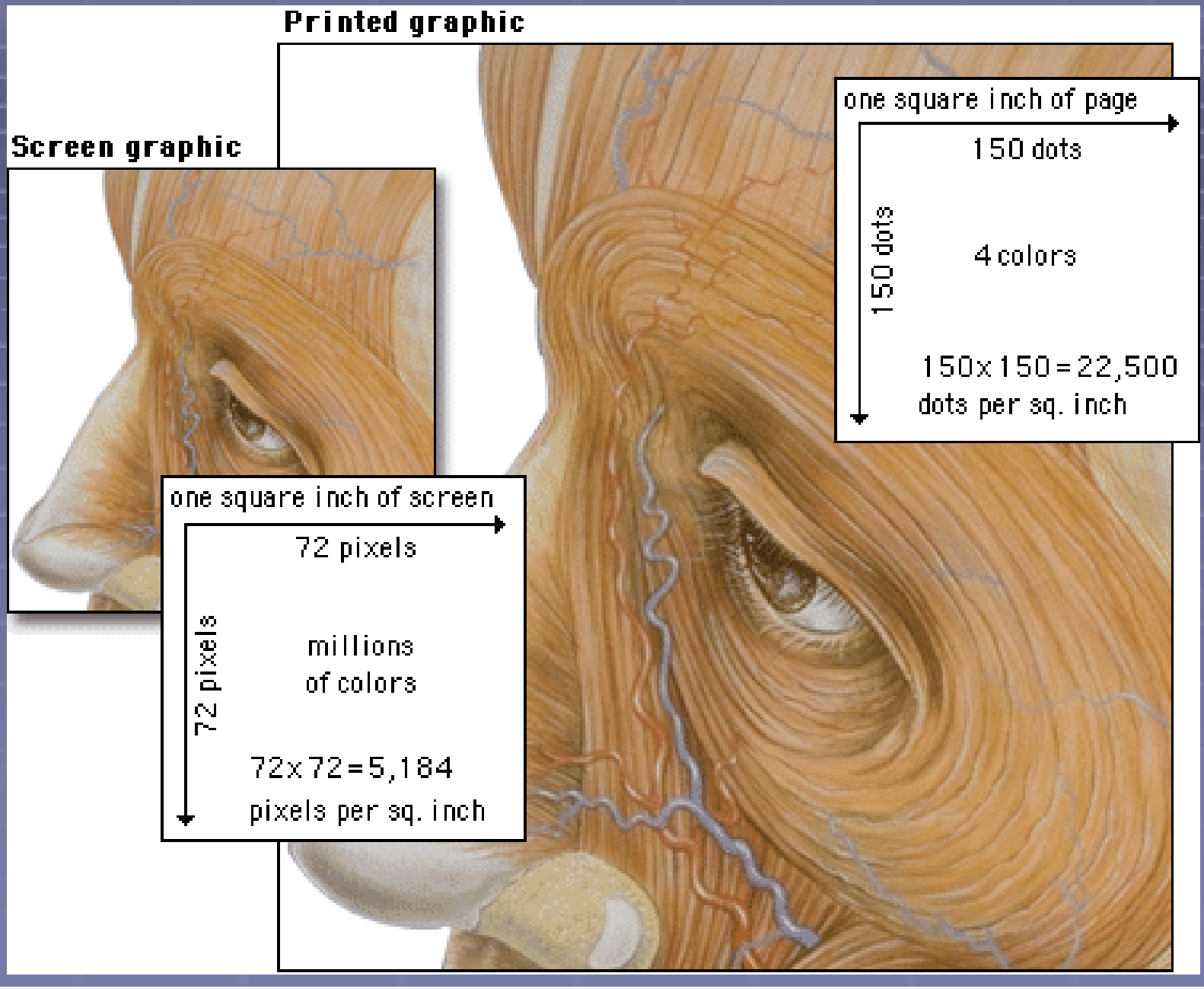
Web graphics:

The screen versus printed color artwork

In terms of resolution, the computer screen is limited to about 72 to 92 dots (pixels) per inch of resolution.

But most four-color magazine printing is done at 150 dpi, or only about four times the resolution of the computer screen (150 dpi is four times the resolution of 75 dpi because resolution is measured over area, 150 x 150 per square inch):

Screen vs. printed



Screen vs. printed

Color printed images are separated into four subtractive printing colors (cyan, magenta, yellow, and black).

By comparison, as mentioned, current computer monitors can display millions of colors, producing a richness of color that easily rivals the best quality color printing.

Also, computer screens display transilluminated images — the colored light shines out from the screen.

Transilluminated images deliver a much greater range of contrast and color intensity than images printed on opaque paper, which depend on reflected light.

Screen vs. printed

Computer displays show color images using the additive RGB (red-green-blue) color system, which can display a much broader and subtler range of colors than conventional four-color printing.

Bottom line: the computer screen is lower in resolution, but because of the other advantages of computer displays, images on Web pages can easily rival color images printed on paper.

Image formats for the web:

The JPEG Image Format

JPEG stands for Joint Photographic Experts Group.

This format was created to display full-color photographic images in a portable format with a small file size.

Like GIF images, they are also very common on the Web. Their main advantage over GIFs is that they can display true-color images (up to 16 million colors), which makes them much better for images such as photographs and illustrations with large numbers of colors.

Image formats for the web:

The GIF image format

GIF stands for Graphics Interchange Format. It is probably the most common image format used on the Web.

GIFs have the advantage of usually being very small in size, which makes them fast-loading.

Unlike JPEGs, GIFs use lossless compression, which means they make the file size small without losing or blurring any of the image itself.

Image formats for the web:

The GIF image format

GIFs also support transparency, which means that they can sit on top of a background image on your web page without having ugly rectangles around them.

Another cool thing that GIFs can do is animation.

You can make an animated GIF by drawing each frame of the animation in a graphics package that supports the animated GIF format, then export the animation to a single GIF file.

Image formats for the web:

The GIF image format

The major disadvantage of GIFs is that they only support up to 256 colors (this is known as 8-bit color and is a type of indexed color image).

This means they're not good for photographs, or any other image that contains lots of different color, but they are an excellent choice for logos and graphic text objects.

Type (fonts) for the web:

Web-Safe Fonts for Your Site

Choosing the right typeface for your website copy is important, since it will affect the way your readers perceive your page (serious and formal, or friendly and casual).

Aside from this, there are also important usability concerns.

Type (fonts) for the web:

Web-Safe Fonts for Your Site

For example, some font types are more easily readable than others, and some are more widely available.

You want to choose font types that:

1. fit the character of your site,

2. are easy to read on a computer screen, and

3. are widely available across many browsers and operating systems.

Type (fonts) for the web:

Web-Safe Fonts for Your Site

There are basically two types of fonts:
serif and sans serif.

Serif fonts are those that have fine cross-lines at the extremities of the letter.

Sans serif ("sans" being the French word for "without") are fonts that don't have serifs.

The most common serif font is probably Times New Roman.

Arial is an example of a common sans serif font.

What is multimedia?

A combination of various types of media, including sound, animation, video and graphics.

Some examples:

Motion:
Flash (.swf)
Animated .gif

Video:
Quiicktime (.mov)
Real Audio/Video (.ra, .ram or .rm)
Windows Media Video (. wmv)
Another Windows video type (.avi)

What is multimedia?

Examples:

Audio:

.wav (large file size – somewhat outdated)
.mid (digital sound file)
.mp3 (smaller file size)
.ra or .rm (Real Audio)
.wma (Windows Media)
.aiff (Macintosh)

Site architecture:

File directory organization:

Root directory “/” (main folder) – where the entire website is contained

Root directory “my_website” may contain:

- about.html (file)
- contact.html (file)
- index.html (homepage file)
- services.html (file)
- Assets (subdirectory)

index.html for homepage must always be located in the root directory of site.

example path: /index.html

Directory structure

Subdirectories in root folder (nested folders):

assets/

images/

daisy.jpg

logo.gif

face.jpg

sounds/

symphony.mp3

flash/

intro.swf

pdf/

guidelines.pdf

brochure.pdf

css/

styles.css

nav_styles.css

Directory structure

Larger websites can have more complex directories, each with their own home page:

services/

index.html

graphics.html

webdesign.html

Absolute path to services would be:
www.mywebsite.html/services

This will pull the index.html for that directory.

What is a file “path”?

The file path is the location of the file as it is stored in a series of directories.

Paths point to their location using a string of characters signifying directories, separated by a delimiting character, most commonly the forward slash "/” or backslash character "\”

In simpler terms, a path is the roadmap to where a file is located a computer.

“Relative” and “absolute” paths…

Relative paths are used when referencing directories and files within a website and are “relative” to the page from which the reference is being made.

Example relative path from the homepage to the image “face.jpg” would be: assets/images/face.jpg

Example of absolute path to image “face.jpg” that is on website (or being referenced from different web site):

http://www.mywebsite.com/assets/images/face.jpg

Web site file directories…

Larger websites can have more complex directories, each with their own homepage:

Services (directory or folder name):
index.html (file)
graphics.html (file)
webdesign.htm (file)

Absolute path to services would be:
www.mywebsite.html/services

This will pull the index.html for that directory

What is index.html?

When you type in the URL of a web site, but do not specify an actual file name (eg http://www.google.com, the server will look for a file named "index.html" and will display it on your browser.

This is the home page for the web site.
You can display the same page by typing
http://www.google.com/index.html

When an client (generally a web browser) requests a url that points at just a directory rather than at a file within a directory the web server will generally serve up some kind of main or index page.

Web guidelines:

Web Guidelines – Naming Files, Subdirectories, and Links

The way you name Web files, subdirectories, and links makes it easier for users to find information and navigate your site.

A logical naming system also makes it easier for you to maintain your site.

Organize files into subdirectories

Web guidelines:

Web Guidelines – Naming Files, Subdirectories, and Links

If you are a Windows user, it may help to think of a subdirectory as being similar to a folder.

You can organize your HTML files by topic in subdirectories.

You might create several different subdirectories, such as a forms subdirectory, or a graphics subdirectory.

File names for the web:

The rules for naming Web page files are somewhat different from those for naming files on your personal computer.

* Name your top-most Web page file index.html or index.htm and reference any other files from within that.

* Do not include spaces in your file names. Without special encoding, a Web browser cannot find a file called myWWW file.html (it reads only up to the space, so thinks it should find a file called myWWW and can't, of course.)

File names for the web:

* It is best to avoid using characters other than letters, numbers, and the underscore (_) in your file names. Although they can work, special characters such as: $? @ # % - [ ] ' , : { } often have other meanings on the Web, and Web browsers can get hung up trying to interpret them.

* It is important to pay attention to upper case vs. lower case characters. A file called RoyRogers.html is different from a file called royrogers.html, and different yet from ROYROGERS.html. The case used in a link must match the case used in the file's name.

File names for the web:

* Here are some examples of acceptable Web page file names:

myhouse.html
our_kids.html
our_1st_puppy.html
house_plan1.gif
map_to_house.gif
horses.gif
MyHouse.htm
our_1st_puppy.jpg
mugShot.jpg