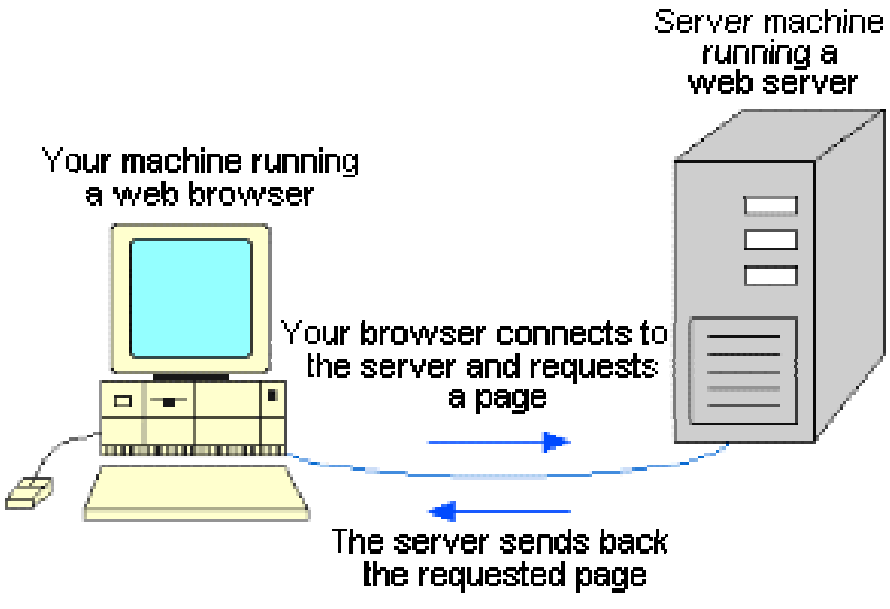
How the Internet Works

The Basic Process

Let's say that you are sitting at your computer, surfing the Web, and you get a call from a friend who says, "I just read a great article! Type in this URL and check it out! It's at http://www.uen.org/greatarticle.htm". So you type that URL in to your browser and press return. And magically, no matter where in the world that URL lives, the page pops up on your screen!

At the most basic level possible, the following diagram shows the steps that brought that page to your screen:



Your browser formed a connection to a Web server, requested a page and received it. If you want to get into a bit more detail, here are the basic steps that occurred behind the scenes:

- The browser broke the URL into 3 parts:
    1. The protocol ("http")
    2. The server name ("www.uen.org")
    3. The file name ("index.html")
- The browser communicated with a name server to translate the server name "www.uen.org" into an **IP Address**, which it uses to connect to the server machine.
- The browser then formed a connection to the server at that IP address.

- Following the HTTP protocol, the browser sent a GET request to the server, asking for the file " http:// www.uen.org/index.html ".
- The server then sent the HTML text for the Web page to the browser.

The browser read the HTML tags and formatted the page onto your screen.
If you've never explored this process before, that's a lot of new vocabulary.

The Internet
So what is "The Internet"? The Internet is a gigantic collection of millions of computers, all linked together on a **computer network**. The network allows all of the computers to communicate with one another. A home computer is usually linked to the Internet using a normal phone line and a modem that talks to an Internet Service Provider (**ISP**). A computer in a business or university has a Network Interface Card (**NIC**) that directly connects it to a Local Area Network (**LAN**) inside the business. The business then connects its LAN to an ISP using a high-speed phone line like a **T1 line**. A T1 line can handle approximately 1.5 million bits per second, while a normal phone line using a modem can usually handle 30,000 to 50,000 bits per second.

ISPs then connect to larger ISPs, and the largest ISPs maintain fiber-optic "backbones" for an entire nation or region. Backbones around the world are connected through fiber-optic lines, undersea cables or satellite links. In this way, every computer on the Internet is connected to every other computer on the Internet.

How the Web Page Works
Have you ever wondered how a Web page works? Have you ever wanted to create your own Web page? Have you ever heard the word "HTML" and wondered what it means?

So let's set the stage. At this moment, it is nearly guaranteed that:

- You are sitting at your computer.
- You are using a **Web browser** to read this page, and that browser is either Netscape Navigator or Microsoft Internet Explorer.
- You want to learn how Web pages work, and perhaps learn the art of creating your own pages.

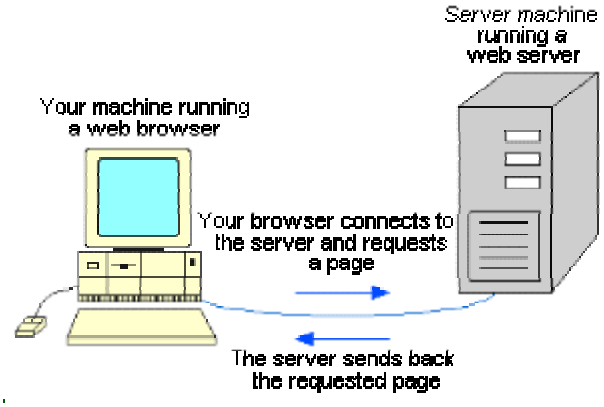
Because you are sitting at a computer, you have a Web browser and you possess the desire to learn, you have everything you need to get started. You can learn HTML and experiment with your Web browser to find out how to create any kind of Web page you can imagine.
In order to talk about Web pages and how they work, you will want to understand four simple terms:

- **Web page** - A Web page is a simple text file that contains not only text, but also a set of **HTML tags** that describe how the text should be formatted when a browser displays it on the screen. The tags are simple instructions that tell the Web browser how the page should look when it is displayed. The tags tell the browser to do things like change the font size or color, or arrange things in columns. The Web browser **interprets** these tags to decide how to format the text onto the screen.

- **HTML** - HTML stands for **Hyper Text Markup Language**. A "markup language" is a computer language that describes how a page should be formatted. If all you want to do is display a long string of black and white text with no formatting, then you don't need HTML. But if you want to change fonts, add colors, create headlines and embed graphics in your page, HTML is the language you use to do it.

- **Web browser** - A Web browser, like Netscape Navigator or Microsoft Internet Explorer, is a **computer program** (also known as a **software application**, or asimply an **application**) that does two things:

    - A Web browser knows how to go to a **Web server** on the Internet and request a page, so that the browser can pull the page through the network and into your machine.
    - A Web browser knows how to **interpret** the set of **HTML tags** within the page in order to display the page on your screen as the page's creator intended it to be viewed.



- **Web server** - A Web server is a piece of computer software that can respond to a browser's request for a page, and deliver the page to the Web browser through the Internet. You can think of a Web server as an apartment complex, with each apartment housing someone's Web page. In order to store your page in the complex, you need to pay rent on the space. Pages that live in this complex can be displayed to and viewed by anyone all over the world. Your landlord is called your **host**, and your rent is usually called your **hosting charge**. Every day, there are millions of Web servers delivering pages to the browsers of tens of millions of people through the network we call the Internet.

It is extremely easy to experiment with Web pages without using a server. Your browser can view the Web pages you create from your personal machine. Once you understand how to create your own pages, it is likely that you will want to put them "out on a server," so that people around the world can load your pages and read them.

Viewing the Source

First, let's take a look at the "guts" of a Web page. This is the original text and **HTML tags** typed by the author and interpreted by the browser to produce the Web page you actually SEE on the Internet. With your mouse, right-click on any blank portion of a web page and choose "View Source." A new window will appear, displaying words and characters, some of which may look pretty technical and foreign. These words and characters are, collectively, the HTML programming **code** you are about to learn. Each element within that code is known as an **HTML tag**. Don't be intimidated by how complex it looks -- you'll be surprised at how easy it really is. When you are done looking at the page's source code, simply close out the source page to the page.

You can look "behind the scenes" of almost any page on the Internet this way. When you become more involved in Web designing, you'll probably find yourself viewing the sources of complicated Web pages in order to learn the codes that the authors, or page designers, used to create such interesting arrangements.

Updating

Keep your site current. There are some projects that may not ever need new information, but most sites benefit from current and regular updates.