Workshop Handouts

Harnessing the Power of the Internet
Full Set

Workshop, presented by David Warlick
The Landmark Project
919-571-3292
david@landmark-project.com

http://landmark-project.com
or
http://landmarks4schools.org

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Collaboration

Finding Experts

If you use the Internet, then you collaborate. It is the nature of the medium. Each time you send a message or reply to one you have received; each time you share your e-mail address with a friend, associate, or an educator you meet at a conference, you are opening avenues to collaboration. Throughout this book, you will see examples of how Internet tools provide links between people, links that unfold within contexts of our professional and personal goals. Within these online collaborations and resulting virtual communities, people tend to accomplish things that are bigger than any one of them.

There are also a number of databases of mailing lists available on the Internet. Some of these databases are searchable. One excellent place to search for mailing lists is Catalist. This is an online database of Lists that utilize the listserv mailing list managing software by L-Soft. The URL for Catalist is:

http://www.lsoft.com/lists/list_q.html

As an example, let’s say that I am a science teacher preparing a new unit on earthquakes. I have just learned about mailing lists and assume that earthquake scientists are probably using this technology for collaboration. If I can find such a mailing list and perhaps even join that list, I would be able to eavesdrop on the conversations of these experts and learn things that could be included in my new unit.

When I enter the keyword, earthquake, into the search tool and click Start the Search, I am presented with two lists that include the keyword in their title or description. I select the second one because it seems most relevant to what I want my students to learn. In the report that appears, I learn that there are currently 293 members of this list and that it even has a web archive of messages posted to the list going back to October, 1989. I also learn that I can join this list by sending an e-mail message to:

listserv@listserv.nodak.edu

…and type in the body of the message:

subscribe quake-IThere are a number of services on the Internet that have organized opportunities for classrooms to collaborate with experts. Below are some examples.

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What is an Internet Mailing List?

An Internet mailing list is similar to the postal variety. It is a list of addresses, e-mail addresses, to which messages can be sent in a bulk-mailing fashion. One person sends the message to a central e-mail address, and the message is copied to all members.

Internet mailing lists have one important advantage over postal mailing lists: any member can send a message to all other members by addressing the message to the list address. Any member of the list can send announcements, solicit help, report successes and less successful projects, and open discussions of any type – and respond to those messages. An Internet mailing list can sometimes be like an ongoing conference meeting with continuing conversations on topics of interest.

To join most Internet mailing lists, you only need two pieces of information:

1. The name of the list, List Name.
2. The e-mail address of the computer that maintains the list, List Address.

Once you have this information, you simply address an e-mail message to the list address, and type in the subject of the message:

Subscribe <list name> <your name>

Then send the message. After a moment you will receive an automatic e-mail message from the computer welcoming you to the list and explaining some of the guidelines for participating in the discussions.
Most of these services allow the teacher or students to post questions to an expert. The queries are made available to a network of experts who respond as they are uniquely qualified or because it is their week to respond to questions. This serves two important purposes.

Finding Online Communities

Other sources of Internet mailing lists include:

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<td>Tile.Net</td>
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Using School Web Site Directories

Sometimes you would like your students to collaborate with a class in a specific geographic location. It is possible to find teachers from these places on a mailing list, but a more efficient way of locating classes by geography is to use school web directories. These are services on the Internet that allow schools to register their web sites so that they will be listed in a school sites directory. There are several of these directories, but perhaps the oldest and most established is Web66. The URL for Web66 is:

http://web66.umn.edu/

As an example, let's say that you are a social studies teacher, and you are preparing to teach a unit on Mediterranean culture. You would like to locate a class in Italy with which your students might create and exchange published travel guides for teenagers taking vacations in your respective regions. To locate such a class using Web66, you would follow these directions:

1. From the Web66 home page click International Registry of Schools on the Web. The Registry of Schools is a database of schools from around the world who have registered their web site so that other people can find them.

2. A map of the United States appears. We click the word Europe so that we can get the Europe registry page.

3. When the map of Europe appears, we click the outline of Italy and receive a list of elementary and secondary schools with web sites.
4. Next, you view a number of the web sites, make a record of the e-mail address of the site web masters, and then post your e-mail message to a number of them asking if they have any classes that might be interested in your project.

5. One of the issues that you may have to deal with is the language barrier. Traditionally, languages have not been much of a problem for Internet users, since most users were from industrial countries where English serves as a convenient common language. However, as more of the developing world comes online, language will increasingly become a barrier to collaborations within all communities of interest on the Internet.

6. To help us communicate through these barriers, several translation services have emerged on the Internet. Perhaps the most frequently used service is part of the Alta Vista search engine. You will find Babelfish at:

http://babelfish.altavista.com/

When you have loaded this web page, simply type or paste the text that you would like translated into the large text box, select the language you want the text translated to, and the click the Translate button.

Peer Collaboration and Project-Based Learning

Dr. Sylvia Chard, of the University of Alberta, uses the following definition of Project Approach learning on her web site (http://www.project-approach.com/).

A project is defined here as an in-depth investigation of a real world topic worthy of children's attention and effort. The study may be carried out by a class or by small groups of children. Projects can be undertaken with children of any age. They do not usually constitute the whole educational program. Younger children will play and explore as well as engage in projects. Older children's project work will complement the systematic instruction in their program.¹

Typically, when the Internet is an integral part of a project, student collaboration is one of the focuses. But beyond that, it is very difficult to characterize such a project. They can be simple or they can be complex. They can involve only three or four students, your entire class, or a dozen classes from around the world. They can focus on a specific discipline, or integrate a number of subject areas together.

Essentially, Net-based PBL is when students are accessing information from web pages or from other people, processing that information in some way, and assembling it into a valuable information product – all within the context of instructional objectives.

Perhaps the best way to understand Net-based PBL is through an example. The following describes a project that I conducted over the Internet a couple of years ago. It was called the Eco-Marketing Project.

The Eco-Marketing Project

The primary learning objective of this project was to help students develop descriptive and persuasive writing skills. Students in about fifteen classes in the U.S., Canada, and Europe were divided into teams of three or four students per team. Each team acted as a company. Their task was to develop an imaginative new product that they had never seen in a store or shopping catalog, but a product that they thought other kids would buy. Also, at least 50% of the materials that went into the construction of their product had to be recycled materials.

After fully developing the ideas around their product, each team had to collaborate to write a sales pitch, text that not only described their product and what it did, but also convinced the reader that he or she should buy this product. After they completed their work, each team installed their sales pitches on a web site, adding to an online catalog of student-created imaginative products. Other students were encouraged to come to the web catalog and shop, each shopper receiving 200 make-believe dollars with which they could select and mock purchase the products that they would most like to have.

The writers could periodically check their product sales, authentically evaluating the quality of their writing. If they were not satisfied, they could examine their sales pitches, and then edit them based on what they learned about writing descriptively and persuasively. Upon re-issuing their sales pitch, they could continue to evaluate their writing in terms of orders.

Components of PBL Activities

Developing project ideas for your class can be difficult. Sometimes the simpler projects can be the hardest to coordinate. At the same time that you are designing the project to help your students develop their skills, you can also add components that ease your management tasks, enabling you to spend more time facilitating students learning.

The following list may help by providing a flexible structure for your ideas. This list includes components that may or may not be present in your project idea, but each of which can add value to your teaching and learning experiences. I will also describe how each item is related to the Eco-Marketing Project, described above.

1. Explicit connections to established instructional standards
   The primary curriculum objective of Eco-Marketing was to help students develop writing skills described in the local or state curriculum standards. Additional objectives were also identified including skills and content from the science and social studies curriculum as well as mathematics and health.

2. Collaboration either among students in your class, between students and experts, or among students in a variety of classes
   Students, first of all, were working in teams to develop and sell their imaginative product. After they had installed their sales pitches, they were collaborating with other students from across the Internet to evaluate the quality of their writing -- collaboration between producers and consumers. Another feature of this project was that students could ask questions of students in three business colleges; questions regarding marketing, supply & demand, and other related issues.

3. Information research or accessing, either through survey
   Participating classes were encouraged to research materials to be used in their products in order to identify recycled materials that could be included in its construction. The depth of this research and its outcomes depended on the teacher. Students were also encouraged to conduct market research, testing the interest consumers might have in their product through surveys.

4. Information processing such that students are analyzing, formatting, or assembling information – in most cases using information processing software
   Students could use a spreadsheet program to analyze the market research data that they collected. They also digitally assembled information into a sales pitch, using word processing software.

5. The construction of a unique and valuable information product
   This is perhaps the weakest component of the Eco-Marketing Project. Although their sales pitches were not of particular value to other people, students knew that they would be read and that other students would be making decisions about the effectiveness of their products, resulting in orders. Some of the best projects on the Internet result in information products that people actually seek out and use. ThinkQuest is an excellent example of students constructing unique and valuable information products.

6. Self-assessment
   This is perhaps the most difficult component to design into your project, though it can be the most important. In the Eco-Marketing Project, students are encouraged to evaluate their own work and to improve it based on the student-centered outcomes...sales.
Types of Online Projects

No one has done as much thinking about online projects as has Dr. Judi Harris of the University of Texas in Austin. In 1994 and 1995, she published a column in The Computing Teacher, published by the International Society for Technology in Education (http://www.iste.org). In this column, called Mining the Internet, Dr. Harris described a structure of online instructional projects with categories that fell into one of three main genres. They were:

1. Interpersonal Exchanges
2. Information Collections
3. Problem Solving Projects

With Dr. Harris' permission, I am paraphrasing a number of the most commonly used project categories. You can read the complete text of her descriptions at:

http://ccwf.cc.utexas.edu/~jbharris/Virtual-Architecture/

"Keypals"

This is probably the first type of online project conducted over the Internet, and is a frequent first leap into instructional Internet projects for many teachers. In most cases it involves individual students in one class matched up with individual students in another class, usually in a different geographic location. The students send e-mail messages back and forth on topics of their choosing.

The value of these projects is improved writing and reading. Research has shown that students write more, in greater detail, taking great care with spelling, grammar, and punctuation when writing to distant audiences over the Internet.\(^2\)

The downside of "Keypal" projects is the coordination that they require. Managing the constant exchange of e-mail with specific matches for each student in the class turns this seemingly simple project into a management challenge, making sure that each student receives his or her correspondence in a timely manner. Students frequently lose interest in the project if the exchanges are not regular and rapid.

Global Classrooms

Global Classrooms are different from "Keypal" projects in two important ways.

1. The classes communicate with each other rather than individual students
2. The communication is more structured and on topics related to the curriculum

The North Carolina Center for International Understanding (http://www.ga.unc.edu/NCCIU/ispt/) organizes global classroom projects between rural schools in North Carolina and schools in other parts of the world. The teachers meet online and discuss project ideas. One issue that classes in the USA and Japan discussed was how teenagers spent their leisure time. This gave both groups special insights into the cultural differences and similarities between the two countries.

Electronic "Appearances"

We have all invited guest speakers into our classes to share information about their job, hobbies, or travels. The Internet provides a link with a world of guest speakers who are willing be interviewed by your class via e-mail, or even chat or video conferencing sessions. There are a number of projects on the Internet that offer experts of whom students can ask questions.

The Center for Improved Engineering & Science Education has a web page that links to a variety of "ask an expert" projects on the Internet. Just choose the

---

type of expert you are looking for.

http://www.k12science.org/ankanexpert.html

**Impersonations**

This one is fun. You have students communicating over the Internet with someone who is pretending to be someone else, or perhaps your students are impersonating another person.

Impersonation projects probably started at the University of Virginia, when educational history professor, Jennings Waggoner, "became" Thomas Jefferson over e-mail and offered himself to local elementary schools for interview through e-mail.

One of the first online projects that I developed was called *HistoryLink*. Fifth graders from two elementary schools drew out of a hat the names of famous people in history. Each student wrote an e-mail message to their famous person, asking them about their life and times. The messages were e-mailed to the local high school where senior English students conducted research and used a lot of imagination to pretend to be those famous people in history, answering the fifth graders’ questions. Then the historic figures sent questions back asking about their contributions and how they are currently impacting today’s society.

**Virtual Gatherings**

Virtual gatherings are characterized by students gathering from different geographic locations at a specific cyber location in real time. Frequently this is done through chat rooms or video/audio conferences. Perhaps the best example of virtual gatherings is when students meet in a Multi-User Domain (MUD). MUDs are text-based virtual realities where visitors read about their surroundings, moving from room to room and manipulate objects by typing two or three word commands. From inside a MUD, students can also communicate with each other within the context of a place. Students can also collaborate in building objects and places in the MUD, such as a 15th century Danish castle while studying Shakespeare.

**Information Exchange**

These are typically very simple but powerful projects that involve students sharing information with each other over the Internet. Usually, they involve a web-based or e-mailed survey that seeks information related to a topic the class is studying.

Dr. Harris describes one of my projects as an example of Information Exchanges, a project called the *Global Grocery List*. This project involves a web form that asks students to record the average local price for each item in a standard grocery list. The list also includes the price of gasoline, housing costs, and per capita income -- as well as the map coordinates of the students’ location. The data is compiled on the *Global Grocery List* web site (http://landmark-project.com/ggl.html) where classes can download it and use the information in a variety of classes including social studies, science, mathematics, home economics, and others.

**Finding Existing Online Projects**

The best way to start using Project Based Learning in your classroom is to participate in a project that has already been developed. There are a variety of web sites that host or list online projects. Here are just a few:
Perhaps the most valuable resource on the Internet for finding and announcing online projects is Global School House’s Projects Registry. The Projects Registry is an online database of projects that have been developed and implemented by teachers from around the world. Here you can search for projects for your class by subject area or grade level. You can also post your own project to the database for others to find as a way of soliciting collaboration from other classes. When a project has been posted, it becomes part of the databases, but it also is forwarded into a number of education related mailing lists. As a result, your project lands in the e-mail boxes of teachers around the globe within 24 hours of your submitting it. The Projects Registry can be found at:

http://www.gsn.org/pr/

Developing & Publishing Your Own Online Projects

Dozens of online projects are announced on the Internet every day, and each one is different. There are templates available to help you structure your proposal, and you should use them. But do a great deal of thinking and planning first.

Here are some steps that you will likely move through during the development and implementation of the project:

1. Identify a need. What is the problem that you want to solve? What instructional goals or objectives do you think could be more effectively learned by your students by participating in your online project?
   a. Are the goals or objectives that you want to achieve part of your state or local curriculum standards?
   b. Are the goals or objectives measurable?
   c. Are the goals or objectives common so that your project will be appealing to other teachers, potential collaborators?

2. Inventory the hardware, software, infrastructure, and skills that you have along with the staff that is available to you.
   a. Do you have access to computers that can run web browsers, e-mail and other communication programs?
   b. Do you have access to the software that you and your students will need to achieve the type of communication that you would like?
   c. Is your infrastructure such that your students can accomplish the communication that you would like and is the infrastructure reliable enough that other classes can depend on your project?

3. Design the project. The best approach to take in designing your project is to work backward.
   a. What do you want students to be able to do or know as a result of the project?
   b. What actions by the students will help them develop the target skill or knowledge?
   c. How could those actions be aligned with real-world applications? How can you add relevance to what the students will be doing?
   d. In what ways can you integrate what the students would be doing with other goals or objectives and other disciplines?
e. How will the project work? Remember the components of online projects from earlier in the book, and remember that not all projects must have all components, but each adds dimension and richness to the students' experience.

Note: Make every effort to economize your project. Find ways to automate the management as much as possible. Every minute that you are spending managing the project is a minute that your students are without your consulting.

4. Design a strategy for evaluation.
   a. How will you measure the success of your project?
   b. How can you design the performance measurement into the course of the project?

5. Write a project proposal. Once again, there are a number of templates available on the Internet for writing project proposals.

6. Promote your project.
   a. Look for mailing lists, news groups, and web forums that cater to the types of teachers who would be interested in participating in your project.
   b. Register your project on the Global School House Projects Registry (http://www.gsn.org/pr/).
   c. If you are going to a conference or other meeting where potential participating teachers might be found, draw up a flyer to pass out. Take great care in designing your flyer. Include the instructional objectives, the highlights of what the students will be doing, and the product outcome. Also take a picture of your class, digitize it and include it on the flyer. Most importantly, make your contact information as clear as possible.

   You've dropped your hook and worm into the water. Now wait for a bite.

Establishing Your Own Internet Mailing List

One of the oldest tools for collaborating over the Internet is still one of the most valuable -- Internet Mailing Lists (listservs). Traditionally, establishing a mailing list required having access to an Internet host computer, list management software, and a considerable amount of knowledge and experience with the UNIX operating system and server technology. In other words, you had to know a UNIX guru, and it was going to cost you a lot of chocolate chip cookies.

Over the last few years, a number of web services have emerged to help people establish and manage mailing lists. Unfortunately, many have also disappeared with the decline of dotcom. Two remain: Topica (http://www.topica.com), which is probably the least sophisticated, but very popular; and eGroups, which was purchased by Yahoo two years ago and renamed to Yahoo!Groups (http://yahoogroups.com).

Yahoo!Groups provides a wide variety of set up parameters allowing you to customize your list in a number of ways. As an example, let's say that you are a social studies teacher, and you would like for your students to learn more about their local heritage. To accomplish this you choose to create a mailing list that includes your students and a number of local history experts. The following is the procedure for setting up such a mailing list:

1. Establish an account with Yahoo and Yahoo!Groups -- go to the web site (http://yahoogroups.com) and click Register.
2. You will be asked for a Yahoo user ID (unfortunately a lot have already been taken, so you will have to be creative), a password, and a security question, your e-mail address, first and last names, language preferences and a little demographic information.

3. After you have established your account, you will click Sign In on the Yahoo!Groups page to add or manage your mailing lists.

4. To start a new mail list, click Start a Group or duplicate Start a Group. Since Yahoo!Groups organizes its public mailing lists in a directory, much like the Yahoo site, the first thing they ask for is the logical subject and topic for your list. Select the subject from the displayed list that most closely describes the objective of your list and then the topic within that subject that has the best fit. There will likely be a following list of sub-topics, or you can click Place my group in [topic] to have your list categorized.

5. On the next page, you are asked to fully describe your mailing list. The following information is required:
   - **Name your Group** – This is a descriptive name for your list, the name you will use in conversation. You are limited to 40 characters
   - **Enter your Group e-mail address** – This is a short abbreviated name for your mailing list. It will serve as the e-mail address that people will use to post messages to the list. It should be related to the common name of your list, but shortened or abbreviated. The e-mail address for your list will be the name that you enter here plus @yahoogroups.com.
   - **Describe your Group** – This should be a clear paragraph or two that describes the purpose of the list, the kinds of issues to be discussed and any specifics for the intended audience. If you choose to make your list public, this description will be available to people through the Yahoo!Groups web site.
   - **Select Primary Language** – The language that you select goes into the Yahoo!Groups directory to help people select lists in their native dialect.
   - **Select Directory Listing Type** – Your choices are *Listed* and *Unlisted*. *Listed* means that your mailing list will be considered public and it will be included in Yahoo!Groups directory. *Unlisted* means that the list is private, and the only people who will know about it will be those you or other members inform.
   - **Select Membership Type** – *Open* means that anyone can join the list by sending an empty message to subscribe-[listshortname]@yahoogroups.com. *Restricted* means that you will receive a notification when people request to join your list, and that you will have to approve their subscription. *Closed* means that only you can add members to the list.

6. Note: I have recently changed most of my Yahoo!Groups lists to *Restricted* because of the large number of people joining lists in order to spam them with various advertisements.
   - **Select Moderation Type** – *Unmoderated* means that any member of the list can post messages to the list at any time. This is the most common setting. *Moderated* means that when members post messages, it comes to your mail box first where you decide if it is appropriate for the audience and the goal of the list. If it is, you simply press your e-mail program’s Reply button, and the message is forwarded to all members. *Newsletter* (or most often referred to as a distribution list) means that you are the only member who can
post to the list. This setting is used for announcements, newsletters, and other broadcast style communications.

7. After you submit this data, you will receive a page with a large scrolling text box. You can enter the e-mail addresses of the people to be added to your list here. Beneath that box is another scrolling text box where you can post an e-mail message to be received by the new members of your list.

8. You also have the option of having the addresses you add automatically added to the list or to have them invited, where they will receive an e-mail message with a URL that they can return to in order to actually confirm their subscription.

Yahoo!Groups Web Page

All Yahoo!Groups mailing lists have an associated web site. The URL is:

http://yahoogroups.com/group/[shortname]/

Rich Information Resources

For years, teachers have collected supplemental information from a wide variety of sources to use in their classrooms. About twenty years ago, when my grandparents were moving out of the home they had lived in for nearly 50 years, they gave me 25 years worth of National Geographic magazines. I received this wonderful gift because I was the only schoolteacher in the family. Yet, because I was a schoolteacher, I had scissors in my hands as I leafed through those historic documents. I cut those precious magazines to pieces. I did this so that I could show my students pictures, graphs, and maps so they could learn more about the people and places they were studying. These pictures, converted into learning center activities, gave my students brand new glimpses into cultures and environments, and causes and effects that they had only heard or read about.

Today, the Internet provides teachers with a virtual warehouse of teaching materials. You can find text, pictures, sound files, animations, and video clips, and you find them in abundance. Not only is the information in abundance, but the nature of the information itself makes it far more valuable than the paper pictures that I cut from those precious magazines.

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Excerpts from *Raw Materials for the Mind: 3rd Edition* by David Warlick
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The Language of Search Engines

Search engines are your helpers. They are information assistants who aid you in finding the information that you need to solve a problem, answer a question, or make a decision. Like any other assistant, the degree to which they are able to help depends on the degree to which you are able to tell them what you want. Therefore, communicating with your search engine is a critical part of the search process.

Search engines need to know what information you seek, and they need this information communicated in a logical way -- they are, after all, computers. The language that we traditionally use to talk with computer-based searching tools is called boolean, named after George Boole, a mathematician of the 19th century.

In Boolean Logic we use keywords to describe what words to look for when searching the index. We also use operators to describe the relationships between our keywords and the information that we need. The most frequently used operators are AND, OR, and NOT.

Let's use an example to explore how we would use Boolean Logic to search for information on the Internet. We will look for information about Native Americans in the state of Ohio. In the table below we will explore several concepts involved in speaking Boolean and relate these concepts to our search.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Explanation/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyword</td>
<td>A keyword is a word or term that we believe will be present (or should not be present) in the web pages that we seek. These are the words that we want our search engine to look for. In our example, one word that would likely appear in a web page about Native Americans is Indian.</td>
</tr>
<tr>
<td>Example:</td>
<td>Indian</td>
</tr>
<tr>
<td>OR</td>
<td>In many cases, there may be a synonym of our keyword that might appear in the web page instead of the keyword we have already chosen. To make certain that we do not miss any of these pages, we add the synonym and then separate the two words with the operator, OR. In the case of our example, many web pages would likely use the term Native American, which is commonly used today in the place of Indian. In this case we would use the operator, OR, to say that we want web pages with either the word Indian or the term Native American.</td>
</tr>
<tr>
<td>Example:</td>
<td>Indian OR Native American</td>
</tr>
<tr>
<td>AND</td>
<td>Since we are looking for information about Native Americans in the state of Ohio, then an additional keyword that will be present in the web pages that we seek is Ohio. We want to narrow the web pages that we get to only those about Native Americans in Ohio, so we will say that both terms must be present. Here is where we will use AND.</td>
</tr>
<tr>
<td>Example:</td>
<td>Indian OR Native American AND Ohio</td>
</tr>
</tbody>
</table>
NOT

As we think through the information that we are likely to receive, we realize that there is a baseball team in Cleveland, Ohio, called the Indians. We will want to filter out all web pages about the baseball team. So we will add a new keyword, baseball, and connect it to our search expression with the operator, NOT. We are saying that desired web pages should NOT have the keyword baseball in them.

Example: Indian OR Native American AND Ohio NOT baseball

quotes

Just as we use commas, question marks, and other punctuation to help communicate with people, we use special symbols to clarify what we want from a search engine. One example is the use of quotation marks to define phrases. In our example, Native American is going to look like two separate words to the search engine, each of which could appear any place in the web page. To communicate that these two words belong together as a distinct phrase, we use quotes.

Example: Indian OR "Native American" AND Ohio NOT baseball

Parentheses

Each operator in a search expression defines a distinct keyword concept.

- keyword 1 AND keyword 2
- keyword 3 OR keyword 4
- keyword 5 NOT keyword 6

A keyword concept can consist of:

- A single keyword
  - [keyword 1]
- Two single keywords or phrases connected by an operator
  - [keyword 1 OR keyword 2] AND [keyword 3]
- Keyword concepts connected by an operator to other keyword concepts
  - [keyword 1 OR keyword 2 AND keyword 3] AND [keyword 4 OR keyword 5]

Individual keyword concepts are usually marked by enclosing them in parenthesis. In our example, the following are distinct keyword concepts:

- (Indian OR "Native American")
- ((Indian OR "Native American") AND Ohio)

The final keyword concept, the one that includes all constituent keyword concepts, is called our search expression.

Another way of thinking about search concepts and expressions is mathematical. George Boole was, after all, a mathematician. If you think in terms of order of operations, this is exactly what the parentheses do in our search expression. It defines what keywords to search, and what relationships to test first. You may find your best example in algebra, where these two examples illustrate the same concept in boolean searching and algebra.

Boolean -- ((Indian OR "Native American") AND Ohio)
Algebra -- ((A + B) X C)

Example: ((Indian OR "Native American") AND Ohio) NOT baseball

It is important to note at this point that Boolean Logic is much easier to understand than it is to teach. Yet those who understand know that it is a very effective way of communicating your information needs to your search engine.

Danny Sullivan, of Search Engine Watch (http://www.searchenginewatch.com) maintains a web article called Search Engine Features for Searchers. In this article, which was updated last on September 6, 2001 at the printing of this book, Mr. Sullivan lists Boolean operators that are supported by specific search engines. Here is the information as of that date. To get the latest information on Boolean supported search engines, read his article at

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To make things easier for casual users, Internet search engines have developed alternatives to traditional Boolean Logic. One of the most common conventions is called **Search Math**. It uses pluses (+) and minuses (-), to indicate which terms must (+) and must not (-) be present in the web pages listed by your search engine.

### An Alternative Search Convention

<table>
<thead>
<tr>
<th>Command</th>
<th>Supported by</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td>AltaVista, AOL Search, Excite, Google, HotBot, Lycos</td>
</tr>
<tr>
<td>AND</td>
<td>AltaVista, AOL Search, Excite, HotBot, Lycos</td>
</tr>
<tr>
<td>NOT</td>
<td>AOL Search, Excite, HotBot, Lycos</td>
</tr>
<tr>
<td>()</td>
<td>AltaVista, AOL Search, Excite</td>
</tr>
<tr>
<td>NEAR</td>
<td>AltaVista (10 words), AOL Search (specify number), Lycos (25 words)</td>
</tr>
</tbody>
</table>

**Pluses (+)**

Any keywords in your search expression that MUST appear in your desired web pages should be preceded by a plus symbol (+).

If the keyword is a phrase, then it should be enclosed by quotes.

**Example:** +basketball +"Michael Jordan"

**Minuses (-)**

Any keyword that must NOT appear in your target web page should be preceded by a minus symbol (-).

As when using the plus symbol, if the keyword is a phrase, then it should be enclosed by quotes.

**Example:** +basketball +"Michael Jordan" -Nike

**Pipe (|)**

This character is usually above the backslash (\) on your keyboard.

The pipe character helps you to fine-tune your search. Placing a pipe character between two search terms tells the search engine to search for the first term and then search for the second term within the first term's hits.

**Example:** Internet|Web

### Here are a Few Search Engines

<table>
<thead>
<tr>
<th>Service</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google</td>
<td><a href="http://www.google.com">http://www.google.com</a></td>
</tr>
<tr>
<td>Alta Vista</td>
<td><a href="http://www.altavista.com">http://www.altavista.com</a></td>
</tr>
<tr>
<td>All the Web</td>
<td><a href="http://www.alltheweb.com">http://www.alltheweb.com</a></td>
</tr>
<tr>
<td>Northern Light</td>
<td><a href="http://www.northernlight.com/">http://www.northernlight.com/</a></td>
</tr>
<tr>
<td>HotBot</td>
<td><a href="http://www.hotbot.com">http://www.hotbot.com</a></td>
</tr>
<tr>
<td>AOL Search</td>
<td><a href="http://search.aol.com">http://search.aol.com</a></td>
</tr>
<tr>
<td>Lycos</td>
<td><a href="http://www.lycos.com">http://www.lycos.com</a></td>
</tr>
</tbody>
</table>

**Kid Friendly Search Engines (Crawler style search engines that work to filter out adult material)**

<table>
<thead>
<tr>
<th>Service</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask Jeeves</td>
<td><a href="http://www.ajkids.com/">http://www.ajkids.com/</a></td>
</tr>
</tbody>
</table>

---


Conducting effective research on the Internet is rarely as simple as typing in a single keyword and having the solution to your problem surface to the top of your 54,000 hits. The Internet does not yield its gems easily. Yet, just as a detective looks for clues and evidence and is constantly in the process of adapting investigative strategies, the Net searcher who adopts this process approach to searching the Internet will unveil the most valuable resources for teaching and learning.

Teaching this process approach is difficult because it is never the same. Each problem reveals different clues and demands different strategies. However, there is a model that can be used as a springboard for developing this approach and for helping students develop deep research skills. The process is called S.E.A.R.C.H. It is an acronym that describes the process. You start with a Small database search tool, Edit your search phrase based on what you learn, Advance to a larger database search tool, Refine your search phrase, Cycle back and advance again, and finally, Harvest the information gems you have found.

Let's take a quick tour of the process and explore some of the by-products that can result from this approach to searching the Internet.

Start Small

We start small for two reasons. First, as a teacher, you do not have time to sift through 1,350,000 hits, which was the return delivered by Google when I searched for sites with the word "earthquake." However, when I started with Yahoo, with an index a small fraction of the size of Google’s, I received only 267 hits – far more manageable.

There is a second reason. Even though a search of Yahoo’s index revealed only 267 hits, that list included a very good cross-section of what is available on the Internet, both good hits (web pages that will help me solve my problem) and bad hits (web pages that will not help). Early in the search process, I am just as interested in the bad hits as I am in the good hits. For a good detective, it is just as important to know where not to look, as it is to know where to look.

I scan through the list of links produced by Yahoo from my search for "earthquake." I look at only a few pages, but look at those that appear to be useful, and at some that appear to be not so useful. I look for words that are common in the pages that will be useful to me and also for words that are common in the pages that will not be useful. These are clues. I notice that the word "seismology" shows up frequently in good hits, so I jot it down on my list of words that I want to attract.

In my scanning, I also find many web pages about preparation for earthquakes. If I am teaching in California, these will be useful pages because earthquake preparedness is probably part of the curriculum. However, here in North Carolina, we are far more concerned about hurricanes. So "preparedness" will not be useful to me and I add it to my list of words that I want to repel.

I also find a number of web pages about earthquake prediction, and become somewhat excited about the topic at first. However, as I examine these pages more closely, I discover that they are far too technical for my eighth graders and decide to put "prediction" in the repel list as well.

* Search results received on 17 September, 2001

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**Editing My Search Phrase**

I have entered four words into my text processor. The first two are words that will likely appear in web pages that will help me with my new unit on earthquakes. The second two are words that will most likely not appear in web pages that are useful to me.

- earthquake
- seismology
- preparedness
- prediction

My task now is to edit these words into a search phrase that will clearly describe to the search engine the information I am looking for. There are two styles for posing questions to search engines: Boolean and Search Math. Boolean uses operators such as AND, OR, and NOT. Search Math uses pluses (+) and minuses (-) to describe your information needs.

When posing the question in Boolean, it may look like this:

(earthquake OR seismology) NOT (prediction OR preparedness)

In English, this question reads, “Show me web pages that have either earthquake or seismology. Do not show me web pages that have either prediction or preparedness.”

Using Search Math, the search phrase may look like this:

+earthquake +seismology -prediction -preparedness

This question reads, “The pages listed must have earthquake plus seismology not prediction and not preparedness.”

**Advance to a Large Index Search Engine**

I copy and paste my edited search phrase into a large index search engine, such as Google or Alta Vista. The hits that I receive are slightly different between the Boolean and Search Math phrases, but the results from both are useful. One of the web pages that surfaces toward the top of the list is “Seismo-surfing the Internet.” This page includes a long list of web links to other web sites about earthquakes. This would be a very good web page to store in our personal Internet library, our bookmarks. Remember, a well-organized set of bookmarks makes a very good first place to go to find good information for your task.

As I scan down the list of pages, I run across a link to *Fingerquake: Recent Earthquakes Catalog*. What strikes me about this link is the idea of a catalog of recent earthquakes. As I had thought earlier about the types of web resources I might find during my search, data on recent earthquakes had not occurred to me. I click the link to see what I have found.

This new and unexpected web page includes a rather long list (9 pages) of data on individual earthquakes that have occurred over the past two weeks. The data includes the date, time, latitude, longitude, depth, and magnitude for each earthquake. As a teacher, I naturally start thinking of ways that I might use this information in my science unit. One idea might be to have two students print this web page every 14 days. Then each day, a different pair of students plots the geographic coordinates of ten of the earthquakes on a classroom map of the world. It will be interesting and revealing to the students as patterns begin to unfold.

I might also ask students to speculate whether they think there would be more earthquakes in the lower latitudes (closer to the equator), or in the upper latitudes (closer to the poles). Then have them test their hypothesis. Ask if they think the time of day would have an influence on the frequency of earthquakes. This could easily be turned into a lesson on the Scientific Method. In fact, because of the enormous amount of professionally collected scientific data available on the
Internet, a science teacher could teach a wide range of topics using the scientific method as a model, having students make observations, create hypotheses, and then test their hypotheses using the Net-based data.

The important point for teachers is that these ideas would probably not have occurred to me if I had not seen this web page with earthquake data. When we engage in a process approach to searching the Internet, we find types of information that we had not anticipated – images, maps, graphs, video clips, conversations, or tabular data. Invariably, these unexpected types of information will give us unexpected and creative ideas for new and powerful learning experiences for our students.

Refine Search Phrase

I continue to scan hits delivered by my edited search and run across a web page with a QuickTime VR file. Once again, I had not anticipated finding information of this type regarding earthquakes. At this discovery, I decide to refine my search phrase to see if there are more such pages. It is important to note that you are the one to decide when it is time to stop examining your hits and to refine your search phrase, cycle back, and use the search engine again. You might look at ten web pages, or twenty, or only three. You decide when you have collected enough evidence to move to the next phase of your investigation.

In Boolean, my refined search phrase looks like this:

(earthquake OR seismology) NOT (prediction OR preparedness) AND “QuickTime VR”

This Boolean phrase reads, “Show me pages that have either earthquake or seismology, but do not have either prediction or preparedness. The listed pages must also have QuickTime VR.”

Using Search Math, my refined search phrase will look like this:

+earthquake +seismology +“ QuickTime VR” prediction -preparedness

The Search Math phrase reads, “The web pages that are listed must have earthquake plus seismology plus QuickTime VR, not prediction and not preparedness.

Cycle Back and Advance Again

When I have refined my search phrase, I go back and search again. This cycling back is an essential part of the process approach to searching the Internet. With each refinement of my search question, and with each new list of links from a large index search engine, I learn more about my topic, gain new ideas for teaching it, and retrieve additional digital resources to use in my new unit.

On this advance, I receive a list of web sites that all mention either earthquake or seismology, do not mention preparedness or prediction, and all reference QuickTime VR. The page at the top of the list is entitled, Terremoto umbro-marchigiani del 26 settembre 1997. The site includes a number of QuickTime VR (QTVR) photographs of villages in the Umbria and Marche regions of Italy, just after suffering an earthquake on September 26, 1997.

Harvesting the Resources

Finally, as I have identified web resources that will help me teach my unit on earthquakes, I record the URLs, download text and images, and assemble it all into learning experiences for my students. There will be much more about harvesting digital resources later in this chapter.

Conclusion

It is undeniable that the Internet represents unprecedented access to information for students and teachers. This section has hopefully given you some ideas about more effectively finding the information that will help you teach. However, if these new tools are not affecting new styles of teaching and learning in our classrooms, then they are only trying to pour more water into an already full glass. We must use the tools to reshape the vessel.
The Problems with Net-based Information

There are three major considerations in evaluating Internet resources:

1. **Reliability**
2. **Credibility**
3. **Perspective & Purpose**

**Reliability**

The reliability of information from the Internet refers most often to the correctness of the information. However, the issue is complicated by time factors and other constraints that can render information undependable. In this day of rapid change and in a world where our audiences cross cultural boundaries with increasing frequency, it becomes more difficult to rely on information. We must go beyond asking if the information is accurate, and explore under what conditions it will remain accurate. What is true today may not be true tomorrow. What is true for this culture many not be true for that. Will the information remain reliable and relevant for the duration of the information product you or your students are producing and will it be relevant for all of the cultures represented by your audience?

**Credibility**

Credibility refers more to the origins of the information. Does the author and/or the publishing organization have the authority to produce the information and to present it the way that they have? There should be information about the author, other writings, or a biography. There should also be links to the information that lead the author to draw the published conclusions. If this information is not present, then your search is not over. In reality, very few web pages and articles provide this supporting information. You simply must research the author to find justification for using the web resource.

**Perspective & Purpose**

Perspective & Purpose refers to bias. What does the author or publishing organization have to gain by publishing this information? Is there a reason why they would want to present it in a particular way or from a certain angle? Are they selling a product? Are they supporting a specific political agenda? Do they have an axe to grind?

The tendency might be to arrange these three with Net-based information into a Venn diagram. The danger is that we traditionally see only the area where all three circles intersect as being the point of value. This is a mistaken perception for teachers since our content has traditionally been provided by textbooks and carefully selected reference materials in the library. An increasing reliance on real world information that is available on the Internet is forcing us to look at information a little differently, perhaps, a little more realistically.

If you are teaching a unit on the Civil War, and you find a web site that presents the content that you want to cover using an approach that is consistent with the way that you will present the unit, you will want to use this web site. However, upon further investigation, you find that the site was created by an 11th grader. Should you use it? Sure, if it helps you accomplish your goals.

If you are a computer science teacher, and you find a web site that effectively describes various networking topographies that you want your students to learn about, you will want to use the site. Again, upon further investigation, you find that the site was created by IBM, and you know that they put the site up to sell more IBM’s. Do you use it? Of course, if it helps you accomplish your goal.

Sometimes the information is not even true, but it still helps you teach what you want your students to learn. Use it! The truth of the matter is that the valuable information will often rise from outside
the intersection point of all three circles. The decision cannot be made by checks and Venn diagrams. It is a decision that has to be made by the researcher based on criteria that is unique to the task at hand. This theme will be carried a little further later in this chapter. 

Retrieving Information from Web Pages

After we have located information raw materials on the Internet, we must mine them out in ways that take advantage of their digital nature. For instance, simply printing a web page to paper devalues the information because it changes it from bits to atoms. Although there are very good reasons to print a web page, the information is far more valuable if it is harvested digitally, and imported into another information processing tool.

The most basic example of this is highlighting text from a web page and then pasting it into the word processing file that the student is using to write a report or essay. Admittedly this seems a little too easy to many of us. Personally, I remember the long hours that I spent physically copying text from an encyclopedia, letter by letter. That was hard work, and students today seem to have a magic wand, with which they only wave it across the text they wish to use, push a couple of keys, and their work is done.

Again, if all the students are required to do is to write a report about something, then their work is done and they probably haven’t learned very much. However, if their assignment is to compare and contrast two points of view, or to support a position, or to present a new viewpoint on an issue, then their work is not done. They have plenty of time left to consider the information they have copied, to analyze and manipulate the information, and finally to use it or reject it as a building block for accomplishing their goal. There will be much more information on the nature of these new assignments in the next chapter. For now, lets look at how one would technically move digital information from the Internet into a variety of information processing tools.

Text to Disk

Objective Task: You have found a web page of which you need the entire text saved to disk. Examples might be the Declaration of Independence or A Tale of Two Cities. You may be providing disk copies so that your students can easily annotate the document or conduct string searches of the text.

Note: Be aware that when using this technique, you will only be saving the text of the web page. The resulting file will be a text or ASCII file without images and other multimedia.

1. Load the web page into your browser.
2. Pull down the File menu and select Save as...
3. A standard file dialog box will appear (depending on the operating system: Windows 3.x, 95, or Mac OS). Use the dialog box to find a logical location on your disk to save the file.
   
   Enter a filename for the file with *.txt as the file extension. Make sure that the Save as type: section is set to Plain Text (*.txt).

4. Your browser will save the file to the target location on your disk as a text file. You should be able to load this file into any word processor and most web editors.

If you are using Microsoft’s Internet Explorer, it is now possible to save an entire web page to disk, including images and hyperlinks. This can be very helpful to teachers as a way to display web pages to students without having to be online. Here is the procedure:
1. Load the web page into your browser, Internet Explorer.

2. Pull down the File menu and select Save as...

3. A standard file dialog box will appear (depending on the operating system: Windows 3.x, 95, or Mac OS). Use the dialog box to find a logical location on your disk to save the file.

   Enter a filename for the file with "htm" or "html" as the file extension. Make sure that the Save as type: section is set to Web Page, Complete (*.htm * .html).

4. Your browser will save the file to the target location on your disk as a text file. You should be able to load this file into any word processor and most web editors.

Text to Word Processor

Objective Task: You may have found a web page with information about a historic event, specific location, or scientific phenomena. In writing a report or preparing a study guide, you would like to include only portions of the text in your report which are being composed with a word processor.

Note: Be aware that when using this technique, you will only be saving the text of the web page without images or other multimedia.

1. Load the web page into your browser.

2. Using your mouse, highlight the text that you want to include in your information product.

3. Pull down the Edit menu of your browser and select Copy. This will make a copy of the highlighted text, storing the copy in your computer's clipboard.

4. Now that your selected text is stored in your computer, you should start your word processor, or other processing tool. If you have already begun work on your information product, move the cursor to the position where you want the web text to be inserted.

5. In your word processor, pull down the Edit menu and select Paste. This will move the text from your computer's clipboard into the position of the cursor.
Tabular Data to Spreadsheet

**Objective Task:** You are teaching a unit on Africa, and you have found a web page with demographic data on the countries of that continent. You would like to have the columns and rows of data available as a spreadsheet for your students to analyze.

**Note:** There are two techniques for displaying tabular data on a web page, one uses a concept called *tables* and the other is called *preformatted text*. If the text is in courier or typewriter looking font and it does not display borders, then it is most likely a *preformatted* table.

If there are borders around at least some of the cells or if the font is something other than courier, then it is most likely displayed with tables.

**Preformatted Tabular Data**

These instructions apply to Microsoft Excel. You can also move preformatted tabular data into Microsoft Works spreadsheet for the Macintosh. I have not been able to get this technique to work on any other spreadsheet program.

1. Load the web page with the tabular data into your browser.
2. Using your mouse, highlight the rows of data that you would like to include in your spreadsheet file.
3. Pull down the **Edit** menu of your browser and select **Copy**. This will make a copy of the highlighted text, storing the data in your computer's clipboard.
4. Start Microsoft Excel and open a new spreadsheet file (or open an existing file in which you want to insert the web data). Select the cell in which you want the top left corner of the data to be stored. Pull down the **Edit** menu and select **Paste**.
5. The data will appear in your spreadsheet. As you examine the effects of pasting the data into the spreadsheet, you will learn that all of it was entered into the column of the cell that you had selected. If you move one cell over to the right into the next column, you will find that it is empty.
6. To repair this, highlight the entire column that the data flowed into.
7. When the entire column of the data has been highlighted, pull down the Data menu and select **Text to Columns**... This will produce a wizard or series of dialog boxes that will help you convert your data into a spreadsheet.

8. When the data has been preformatted, the Text to Columns wizard will default to Fixed width. This is good. Click Next to go to the next step.

9. In this dialog box, the program makes assumptions about where column divisions should happen. You can add new dividers, move, and delete the dividers that you do not need.

10. This dialog box allows you to determine the type of information for each column. You can designate a column, or combination of columns as **General** or **Numeric Data**, **Text**, or **Date**. In the case of date, you can set the format that you want it converted to. You can also select **Do not import column** to skip the column all together. When you click Finish, you will have a spreadsheet with the data inserted into specific cells.

### Tables Formatted Tabular Data

1. Tabular data that has been formatted with table tags must be handled differently from preformatted data. Rather than copying and pasting the data, we must save the entire page. Pull down the File menu and select **Save as**...

   A standard file save dialog box will appear. Find a logical target location and be sure that the **Save as type** section is set for text. Then save the file.

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2. Next, we have to remove all of the extraneous information, leaving only the data. To do this, load the text file into a text processor, such as WordPad or NotePad. Then carefully delete out all of the information except for the data itself. Then resave the file, with "txt" as the extension.

3. Start Microsoft Excel, and open your saved text file. It will automatically open up into the Text to columns... wizard. From here, follow the directions beginning with Step 8 above.

Images to Graphics Software

Objective Task: You want your students to learn about specific events that happened in America that led to the Revolutionary War and the Declaration of Independence. To do this, you want to give teams of students a map of Colonial America on disk, so that they can use a graphics program to annotate the map, describing the locations and circumstances of the events. You have found a map on the Web and want to download it to a graphics program.

1. Load the web page into your browser.

2. Using your mouse put the pointer on the image that you want to download. It can be anywhere on the image.

3. If you are using a Windows computer, click the right or secondary mouse button. If you are using a Mac OS computer, hold down the mouse button. After a moment a menu will pop out from the image.

4. From the pop-up menu, select Save Image As... A standard file dialog box will appear with which you can select a target location for the file to be saved. The file will either be saved as a GIF or JPEG file. These are the two standard image file types for the World Wide Web.

5. When the file is saved you can open it into your graphics program. If your graphics program will not read GIF or JPEG files, then the file will have to be converted. There are a number of programs available on the Internet that will handle this for you. They range from basic image converters, to full-featured image processing software. Here are some examples and their web locations.

Windows 95/98 and others

LView Pro – This is a shareware program ($39.99) that will handle most file type conversions and also includes a variety of image editing features including: filters, cropping, transparent GIF conversion and more.

http://www.lview.com/
Paint Shop Pro – This shareware ($99.95) program offers a wide variety of conversion types, and professional level image enhancement features including: flexible painting and retouching brushes, adjustable cropping and selection tools, filters, and many other enhancement tools.

http://www.jasc.com

Mac OS

GIFConverter -- This is a basic image converter that will take GIFs and JPEGs and turn them into PICT or Paint, which are the standard image types for the Mac OS environment. The program is shareware ($30).

http://www.kamit.com/gifconverter.html

GraphicConverter – This shareware program ($35) does the same thing as GIFConverter but also has a number of additional image enhancement features.

http://www.lemkesoft.de/

FuturePaint 2.0 – This is an extraordinary graphics program for the Mac operating system (pre-OSX). It has many of the features of commercial products and offers them for free.

http://www.stazsoftware.com/

You can find many more image managing programs for Windows machines at:

Excerpts from Raw Materials for the Mind: 3rd Edition by David Warlick
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teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright."

The law goes on to list four factors to be considered in determining the fair use of copyrighted materials.

1. The purpose and character of the use, including whether the use is of a commercial nature or for nonprofit educational purposes,

   Nonprofit use includes teaching (including multiple copies for classroom use), research, scholarship, criticism, comment, and news reporting. Inappropriate use would include commercial activity, profiting from the use, entertainment, denying credit to the original author, and manipulation of the truth through the information.

2. The nature of the copyrighted work,

   To comply with fair use, the work must be published, factual or nonfiction, and it must help to achieve the educational objectives. If the work is unpublished, highly creative (art, music, films), or fiction, then its use would not fall under fair use.

3. The amount and substantiality of the portion used in relation to the copyrighted work as a whole, and

   It is appropriate to use a small amount that is not central or significant to the entire work, but enough to accomplish your educational objectives. A pretty good rule of thumb is to use no more than 10% of the published work.

4. The effect of the use upon the potential market for or value of the copyrighted work.

   The use is considered fair if the user has lawfully acquired or purchased a copy of the original work and if the use will have no effect on the market or potential market for the copyrighted work. It will not be considered fair if it is obviously simple to receive permission, if you made the information accessible on the Web or other public forum, or if you repeatedly use the material over the long term.

This is important information, not only for teachers but for students. However, making students sensitive to the ownership of copyrighted materials can be challenging, almost as challenging as helping teachers to respect intellectual property. I say this with tongue in cheek, but also with the knowledge that educators, periodically or regularly include materials from magazines, books, the Internet, and other sources in their worksheets, study guides, handouts, overheads, and other instructional materials without regard to the owner of the property.

This is perfectly understandable, and almost excusable. After all, we are on a holy mission to wipe out ignorance, and there should be no barriers to that endeavor. But as we treat information products without regard to the ownership of the product in the instruction of our students, what are we teaching them?

There are two practices what we should incorporate into our efforts to create effective teaching materials for our students.

1. **Always cite your sources**
2. **Seek permission when possible**

Giving credit to the owner or originator of information is at least a courtesy and it is also the law -- and it doesn't hurt you one bit. Writing a citation takes only a few minutes and it extends your or your students' information products by making it a communal work of collaboration. The **B. Davis Schwartz Memorial Library** at the University of Long Island has published a very useful series of pages that describes four citation styles: APA, Turbian, MLA, and Chicago. The pages can be found at:

   http://www.liu.edu/cwis/cwp/library/workshop/citation.htm

---

To further convenience educators who wish to cite materials they are using in instruction, a tool is available on the Landmarks for Schools (http://landmark-project.com) web site called the Citation Machine. This web tool presents a form that you would simply fill in as indicated, supplying the author of the work, title, publisher, dates, etc. The tool then assembles the entered information into an appropriate MLA citation, displaying it on a web page so that the teacher can highlight the text, copy it, and then paste the citation directly into the teacher’s product. This tool will handle citations for books, web sites, journals, newspaper, and magazine articles, e-mail messages, and interviews. Using this tool, a teacher (or student) can create a footnote citation in less than a minute. The tool is available from the front page of Landmarks for Schools or directly at:

http://landmark-project.com/citation_machine/

Seeking permission can take a little longer but it too is the courteous thing to do. People who publish information either in print or on the Web appreciate being asked. It is also very useful to them to learn how other people are using their information. In some cases, the information you would like to use was generated as a result of a grant. The grantees might use your request for permission as justification when the next phase of funding comes around.

Most everyone on the Internet is willing to let teachers and students use their information. You simply need to ask. On the next page is an image of a web tool that is designed to help teachers and students seek permission to use web resources for teaching and learning. The page includes the body of a permission requesting e-mail message. You simply fill in the blanks with your specific information, including your e-mail address. After you also enter the e-mail address of the web master or author of the information you want to use, the page will actually send the permission e-mail for you, and the reply will come back to your e-mail address.

The URL of this web page is:

http://landmark-project.com/permission.html

The Power of Information

There is one other issue of ethics that bears mentioning. Information in the 21st century has value. It also had power. It was said in the 19th century that the pen was mightier than the sword. In the 21st century, the word processor may be mightier than nations. The potential is great to use information skills to accomplish wonderful things. By the same token, the potential is equally present to cause great suffering and pain with the use of information. This is why it is important that students learn to use information within a range of ethical behaviors that help them to become productive and honorable contributors to society. At the same time that we teach students they powerful skills, we must also teach them to love the truth.

An industry that has grappled with the power of information for many generations is journalism. Journalists aspire to high standards of ethics, reflecting the importance of their mission and the potential harm that is possible from irresponsible practices. To define these standards, The Society of Professional Journalists (SPJ) has published a Code of Ethics for its members. You can read this code at their Web site:

<http://www.spj.org/ethics_code.asp>

The code of ethic below has been modeled after the one developed by the SPJ. It is designed for teachers and students as a guideline for making productive and safe use of information.
A Student & Teachers

Information
Code of Ethics

Seek Truth and Express It
Teachers and students should be honest, fair, and courageous in gathering, interpreting and expressing information for the benefit of others. They should:

- Test the accuracy of information from all sources and exercise care to avoid inadvertent error.
- Always identify sources. The consumers of your information product must be able to make their own judgment of its value.
- Always question the sources’ motives.
- Never distort or misrepresent the content of photos, videos, or other media without explanation of intent and permission from the information’s owner. Image enhancement for technical clarity is permissible.
- Tell the story of the human experience boldly, even when it is unpopular to do so.
- Examine your own cultural values and avoid imposing those values on others.
- Avoid stereotyping by race, gender, age, religion, ethnicity, geography, sexual orientation, disability, physical appearance or social status.
- Give voice to the voiceless; official and unofficial sources of information can be equally valid.
- Distinguish between opinion and fact when expressing ideas. Analysis and commentary should be labeled and not misrepresent fact or context.

Minimize Harm
Ethical teachers and students treat information sources, subjects, colleagues, and information consumers as human beings deserving of respect.

- Gathering and expressing information should never cause harm or threaten to be harmful to any one person or group of people.
- Recognize that private people in their private pursuits have a greater right to control information about themselves than do others.
- Consider all possible outcomes to the information you express, guarding against potential harm to others.
- Never use information from another person without proper citation and permission.

Be Accountable
Teachers and students are accountable to their readers, listeners, viewers and to each other.

- Clarify and explain information and invite dialogue about your conduct as a communicator.
- Encourage the information consumer to voice grievances about your information products.
- Admit mistakes and correct them promptly.
-Expose unethical information practices of others.

Respect Information and its Infrastructure
Information, in the Information Age, is property. Information is the fabric that defines much of what we do from day to day, and this rich and potent fabric is fragile.

- Never undertake any action that has the potential to damage any part of this information infrastructure. These actions include, but are not limited to illegally hacking into a computer system, launching or distributing viruses or other damaging software, physically damaging or altering hardware or software, or publishing information that you know is untrue and potentially harmful.
- Report to proper authorities any activities that could potentially result in harm to the information infrastructure.
# Some Raw Data Resources

Following are several raw data resources on the Internet that can be used as teaching and learning raw materials. Beneath each resource is a suggestion of how it might be used for teaching or learning.

<table>
<thead>
<tr>
<th>Service</th>
<th>Description/URL/Publisher</th>
</tr>
</thead>
</table>
| **Air Pollution Monitors Database** | "This is a very powerful database of historic air pollution levels that can be accessed by state, county or city. Each report can be converted to TAB or COMMA delimited files for importing into spreadsheet programs."  
http://www.epa.gov/airsweb/monreps.htm  
U.S. Environmental Protection Agency  
  
Application: Combine state air pollution data with population density data on a spreadsheet and have students plot graphs to identify correlations. Then have students work in teams to speculate on reasons for the patterns and reasons for the states that deviate from the patterns.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
Bureau of Labor Statistics  
  
Application: Divide students into teams with each team responsible for a region of the U.S. Have each team harvest unemployment data on each state in their region and plot a comparison between each state and the U.S. unemployment rate. Ask each team to identify the state that performs the best and the state that performs the least satisfactorily in comparison with the national rate. Then ask each team to research the state with the lowest employment rate and suggest an industry that might be ideally introduced to improve the employment rate.                                                                                                                                                                                                                                                                                                                                 |
Shipments states color coded by the weight or value of commodities shipped there from the originating state. There are also supporting tables of data.  

http://www.bts.gov/gis/maps/inter/index.html  
U.S. Department of Transportation

Application: 1.  Students, working in teams, can identify the state to which their state sells the most goods. Then they can describe how they might improve transportation to those states and make a presentation to the class.  

2.  Students, working in teams, can identify the state to which their state does not deliver many goods. Then they can research those states and speculate on industries that might be added to their state to better serve the under-served states. Then make a presentation to the class.

Some "Words of Humankind" Resources
Following are several "Words of Humankind" resources on the Internet that can be used as teaching and learning raw materials. Beneath each resource is a suggestion of how it might be used for teaching or learning.

<table>
<thead>
<tr>
<th>Service</th>
<th>Description/URL/Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biographical Dictionary</td>
<td>This is a database of biographical information on famous and infamous people. It includes an alphabetical listing and a searchable index. Brought to us by the TV program, Biography. <a href="http://www.biography.com/find/find.html">http://www.biography.com/find/find.html</a> A&amp;E Television Networks</td>
</tr>
<tr>
<td>&quot;California as I Saw It:&quot; First-Person Narratives of California's Early Years, 1849-1900</td>
<td>Consists of the full texts and illustrations of 190 works documenting the formative era of California's history through eyewitness accounts. <a href="http://memory.loc.gov/ammem/cbhtml/cbhome.html">http://memory.loc.gov/ammem/cbhtml/cbhome.html</a> The Library of Congress</td>
</tr>
<tr>
<td>Chief Joseph Speaks</td>
<td>This web page includes selected statements and speeches of Joseph, Chief of the Nez Perce. <a href="http://www3.pbs.org/weta/thewest/wpages/wpgs660/jospeak.htm">http://www3.pbs.org/weta/thewest/wpages/wpgs660/jospeak.htm</a> PBS</td>
</tr>
<tr>
<td>Electronic Text Center -- Latin</td>
<td>An extensive selection of German literature. <a href="http://etext.lib.virginia.edu/lat-on.html">http://etext.lib.virginia.edu/lat-on.html</a> University of Virginia Library</td>
</tr>
<tr>
<td>Excerpts from Slave Narratives</td>
<td>This is a rich and interesting site that features primary sources on conditions of slaves prior to 1880. <a href="Http://vi.uh.edu/pages/mintz/primary.htm">Http://vi.uh.edu/pages/mintz/primary.htm</a> Steven Mintz</td>
</tr>
</tbody>
</table>

Excerpts from *Raw Materials for the Mind: 3rd Edition* by David Warlick  
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<table>
<thead>
<tr>
<th>Service</th>
<th>Description/URL/Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold Rush Memoir</td>
<td>This is the full text of memoirs written by Eugene Ring about his experiences during the California gold rush.</td>
</tr>
<tr>
<td></td>
<td><a href="http://uts.cc.utexas.edu/~scring/index.html">http://uts.cc.utexas.edu/~scring/index.html</a></td>
</tr>
<tr>
<td></td>
<td>Steven Charles Ring</td>
</tr>
<tr>
<td><strong>Application:</strong></td>
<td>Have students read the words of Eugene Ring. Then ask them to pretend that they are Mr. Ring, and write several letters home to the East, describing his experiences to his family.</td>
</tr>
</tbody>
</table>

| Historical Text Archives | "This web site features text archives and other resources on more obscure facets of U.S. history, including: Yorktown, pre-1700 documents, Georgia before Oglethorpe, and northwest coast Indian history" |
|                         | http://www.msstate.edu/Archives/History/USA/colonial/colonial.html                                                                                      |
|                         | Mississippi State University                                                                                                                             |
| **Application:**        | One of the links on this site points to fashions of the 17th century. Students might harvest images of clothes people wore during this time and make a multimedia presentation (PowerPoint, HyperStudio, or a web site) |

| Project Gutenberg      | Project Gutenberg was the first to begin digitizing the great works of civilization. It began work in 1971 to enter texts into computers and then eventually to make them available via FTP, the Gopher, and now the Web. |
|                       | http://promo.net/pg/                                                                                                                                      |
|                       | Michael Hart                                                                                                                                              |
| **Application:**       | Teachers can download the complete texts of literature that their students are reading. After the books or plays are read, students can use the disk versions and word processor to research the texts, searching for occurrences of specific keywords. Students can also look for patterns of word or phrase usage or commonly used metaphors and other literary techniques. |
The Complete Works of William Shakespeare

This site provides access to all of the published works of the Bard. The plays are hyperlinked to a Shakespeare dictionary where unfamiliar words can be clicked for their meaning. http://the-tech.mit.edu/Shakespeare/works.html

MIT

Application: Shakespeare is perhaps the most quoted writer in history. The next time you are introducing a topic to your class, go to this site and search the entire works of the Bard for occurrences of keywords related to the topic. You may find a fine quote with which to dazzle your class.

Tools for Making Online Lessons

Web-Based Templates

First of all, a web-based template is a web form that you fill out. In the case of a WebQuest, it will likely have form elements for you to complete for an introduction, task, process, resources, evaluation, and conclusion. After you fill these form elements or textboxes in, the template creates your WebQuest web page for you. There are a number of web-based templates. Chief among them are:

Filamentality -- http://www.kn.pacbell.com/wired/fil/

Filamentality’s strength is that it acts like a tutorial. As you construct your WebQuest, the tool asks questions that help you to construct a better learning experience for your students.

Kiko -- http://www.kiko.com/webquests

In a way, Kiko is simpler to use, especially for experienced WebQuest builders. It is actually software that operates more like a page layout program than a web tool. The resulting web pages are well laid out and clear for the students. Kiko also enables teachers to add forms to their WebQuest, providing workspace for students, a place where they can submit their answers and insights. Kiko also provides for the construction of rubrics, a valuable tool for evaluating project-style assignments.

TrackStar -- http://trackstar.hprtec.org/

TrackStar is a product of the High Plains Regional Technology in Education Consortium (HPR*TEC), one of 10 RTECs funded by the U.S. Department of Education. TrackStar is not a WebQuest building tool. However, what it does, it does very well. With TrackStar, a teacher can create a web page with a list of links to other web resources. If a science teacher is planning a unit on volcanoes, that teacher might create a track of links to the web sites of various existing volcanoes. To accomplish this, our science teacher establishes an account on TrackStar and logs in by typing his or her e-mail address and password.


This is my favorite tool for creating online assignments. Server.com was not created for teachers specifically, but for Internet users who wanted to create interactive tools for their friends, family, and associates. One thing that makes Server.com so good is its reliability. This tool has been around for many years, and it has not undergone any significant upgrades. This means that it is simple, fast, and always there.
### Five HTML Tags All Teachers Should Know

<table>
<thead>
<tr>
<th>Tag</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paragraph Breaks</strong></td>
<td>...it is difficult for students in most schools to have significant access to the Internet since there are usually only one or two Internet computers in the classroom. However, that computer can still be used as a professional resource by teachers in a wide variety of ways.</td>
<td></td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td>With sufficiently powerful computers, classrooms can be turned into <em>learning laboratories</em> where students construct their own knowledge through exploration and experimentation.</td>
<td>Bolding is a highly effective way to draw attention to essential parts of your communication.</td>
</tr>
<tr>
<td></td>
<td>With sufficiently powerful computers, classrooms can be turned into <strong>learning laboratories</strong> where students construct their own knowledge through exploration and experimentation.</td>
<td></td>
</tr>
<tr>
<td><strong>Italics</strong></td>
<td>The <em>Library of Congress</em> provides valuable information for teachers through its World Wide Web site.</td>
<td>Italics can be an effective way to draw attention to text, though it should be used sparingly since it can make text harder to read.</td>
</tr>
<tr>
<td></td>
<td>The <em>Library of Congress</em> provides valuable information for teachers through its World Wide Web site.</td>
<td></td>
</tr>
<tr>
<td><strong>Hyperlinks</strong></td>
<td>The <code>&lt;a href=&quot;http://biography.com&quot;&gt;Biography web site&lt;/a&gt;</code> has a wealth of detailed information about famous people in history.</td>
<td>The web address that <em>href</em> is set to is the web page that will be loaded. The text between the beginning and ending tags <code>&lt;a&gt;</code> will become the what? whhyperlink.</td>
</tr>
<tr>
<td></td>
<td>The <strong>Biography web site</strong> has a wealth of detailed information about famous people in history.</td>
<td></td>
</tr>
<tr>
<td><strong>Images</strong></td>
<td><img src="http://www.kjil.com/trs80/mdl3.gif" alt="Can you remember when computers looked like this, and you had to learn a complete language to operate them? Here is the TRS-80 Model III computer. It was one of the first home computers and came equipped with the BASIC programming language so that owners could writing their own software." /></td>
<td>The challenge here is getting an image out onto the Internet or getting permission to link to an existing image.</td>
</tr>
<tr>
<td></td>
<td>Can you remember when computers looked like this, and you had to learn a complete language to operate them? Here is the TRS-80 Model III computer. It was one of the first home computers and came equipped with the BASIC programming language so that owners could writing their own software.</td>
<td></td>
</tr>
</tbody>
</table>
There are a few additional HTML tags that could be helpful to teachers who are communicating content through the Web.

<table>
<thead>
<tr>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;dir&gt;</td>
<td>Any paragraph(s) of text that is enclosed in the &lt;dir&gt;&lt;/dir&gt; tags will be indented to the right.</td>
</tr>
<tr>
<td>&lt;hr&gt;</td>
<td>The &lt;hr&gt; tag stands for horizontal rule. This produces a single line across the web page and serves to separate types of content.</td>
</tr>
<tr>
<td>&lt;font size=4 color=red&gt;text&lt;/font&gt;</td>
<td>The &lt;font&gt;&lt;/font&gt; tag can be used to change the size of the text and its color. The values for size can go from one to seven, seven being the largest. There are a number of colors that can be reference by name: Aqua, black, blue, Fuchsia, Green, Gray, Lime, Maroon, Navy, Olive, Purple, Red, Silver, Teal, White, yellow</td>
</tr>
<tr>
<td>&lt;ul&gt;</td>
<td>The &lt;ul&gt;&lt;/ul&gt; and &lt;li&gt; tags produce a bulleted list:</td>
</tr>
<tr>
<td>&lt;li&gt;</td>
<td>• Item one</td>
</tr>
<tr>
<td>&lt;li&gt;</td>
<td>• Item two</td>
</tr>
<tr>
<td>&lt;li&gt;</td>
<td>• Item three</td>
</tr>
<tr>
<td>&lt;li&gt;</td>
<td>• Item four</td>
</tr>
</tbody>
</table>

S.L.A.T.E.: An Experiment in Building Web-Assignments

We have looked at a number of tools available on the Internet to assist teachers in building web-based assignment pages for their students. Each has its strengths and its weaknesses.

- TrackStar is easy to use but includes no feature for students to submit work.
- QuizStar does a wonderful job of customizing workspace and even scoring it, but adding resources is difficult.
- TrackStar and QuizStar can be combined, but the end product is not intuitive in operation.
- Filamentality and Kiko both result in fine web-assignments, but neither provides workspace for students.
- And Server.com works beautifully, but requires knowledge of HTML (not much), and the prologue and epilogue files are severely limited in the amount of text they will allow.

As I continued to struggle with this idea of web-assignments, along with many other educators who were members of an Internet mailing list I run called ClassWeb (http://yahoogroups.com/group/classweb), I finally came to the conclusion that the best way to find the tool I was looking for was to build it myself. This solution became a possibility when two years ago I moved my web site over to a new web server, a LINUX server running MySQL, and supporting JAVA, Perl, and PHP. If that doesn’t make any sense, it is ok. It simply meant to me that I had to teach myself how to program.
One of the results of my efforts to learn programming was SLATE, which stands for Strategic Learning And Teaching Environments, or web-assignments. The SLATE to the left was created by Kyle Kauffman, a physics teacher at Southwestern High School in Hanover, Pennsylvania. His SLATE includes an introduction, which sets the stage for the assignment, provides some background information, and describes the task for the students. He then includes resources, links to two web sites he wants his students to visit to gather information for their discussion. The discussion board follows, where his students have shared their insights and added to each other’s ideas. Finally, the students are provided with a rubric, which will be used to evaluate their discussion.

There are two important ideas behind the design of SLATE. One is speed and convenience. As already discussed in this book on several occasions, one of the greatest barriers to making the best use of new technologies in our classrooms is the tragic lack of time that teachers have to reflect, develop skills, and to build new learning experiences for their students. The goal of SLATE is to provide a tool with which teachers can assemble a powerful interactive online learning experience for their students in less than 45 minutes. After a two or three day workshop, I have teachers building them in less than an hour. I have built a SLATE for a workshop I was teaching in less than 10 minutes.

The second idea behind the SLATE experiment is not so simple. A tool, such as SLATE, should be integrated into an existing and reliable library of web resources, so that resources can be “clicked” into the teacher’s web-assignment. SLATE is fully integrated into the Links Library of Landmarks For Schools (http://landmark-project.com). If you go to Landmarks… and select Life Science as a topic, you will be presented with a list of web sites related to the study of life science. For each web resource you will find the title of the site, which is hyperlinked to the site, and a description of the site. For many of the resources, you will also find one or more suggested uses of the web site for classroom instruction.
To the right of each resource is an icon that reads, “Add to SLATE.” When you select a web site for your students to visit and click the “Add to SLATE” icon to its right, a brand new SLATE page will be generated with the title, URL, and description of the selected web site coded into the resource section of the web-assignment. If you return to Landmarks… and click another web resource to SLATE, your SLATE page will return to the front with the second resource included. You can add up to ten web resources to a single SLATE.

Because SLATE is integrated into a links library, the teacher is relieved from the time-consuming task of copying and pasting web titles, URLs, and descriptions. This task is automatic with SLATE and editable.

The edit version of SLATE is basically identical to the student version except that each section of the page has an orange tag to its left.

**Edit Tabs:**

1. **Edit Authorship** – Here the teacher enters his or her name, e-mail address, title for the SLATE, a password to allow later editing, and a password for students to use to enter the SLATE (optional).

2. **Edit Introduction** – This consists of a scrolling text box where the teacher can enter a long stage setting introduction. If a more formal WebQuest is the goal, the Task and Process can also be added here.

3. **Edit Resources** – Teachers can edit all parts of each resource: the title, URL, and description. The description will most frequently be edited to reflect more accurately the intent of the assignment. This is also where a teacher might add web links not available through Landmarks for Schools by simply replacing the existing information.

4. **Edit Workspace** – Here the teacher can add up to five questions. Questions consist of a question and up to four possible answers. If the possible answers are left blank, then the question is assumed to be a short answer or discussion. The teacher can also select “Collaborator” and have the workspace show up as a discussion forum.

5. **Edit Evaluation** – The tool for producing the rubric is identical to the Rubric Builder from earlier in this chapter. The resulting rubric will also have the rubric calculator tab.

There is also a SLATE page on the Landmarks for Schools web site at:

http://landmark-project.com/slate.html
Here you can learn more about SLATE. If you have built SLATE pages, you can also enter your e-mail address and password, and all of your SLATEs will be listed. You can also enter a keyword or phrase and SLATE will list all existing SLATEs that include that word or phrase. If you find a SLATE that you would like to use for your class, you can “clone” the SLATE, making a copy for you, which you can customize for your class and instructional objectives.

Design Issues

Getting information coded, onto a web server, and across tens of thousands of miles of Internet cable is easy. The hard part is designing the pages so that the information travels the 18 inches from the computer display into the reader's understanding. This involves far more than writing coherent sentences and paragraphs. It involves the look of the information and how it is laid out. It also involves how it makes the reader's eyes move. For instance, centered text is difficult to read because it forces the reader to search for the beginning of each line.

In the information age, it is information that will compete for attention, in the same way that products on store shelves competed for attention in the industrial age. How you package your information has become as important as the style and quality of your writing. The information must be:

- Inviting,
- Easy to scan, and
- Easy to understand

In the next section, we will look at a few elements of good web design. In the process, we will adjust a typical front page for a school web site. Upon its initial construction, the page looks like figure 1.

1. Goals, Goals, Goals

Always consider your goals and objectives first. Also consider them last. At any time in the middle that you are making a decision about design, consider your goals and objectives. Anything you can do in the design of your web pages that helps you accomplish your goals is good web design. Anything that distracts visitors from your goals and objectives is bad web design.

2. Use images deliberately

In the information age, information is the commodity, and the currency is time. People are seeking information and they are paying for it with their time. Text takes very little time to load through the Internet – it is inexpensive. Images, on the other hand, take a great deal of time to load. The adage that a picture is worth a thousand words has a quite practical meaning in web publishing. In many cases that picture will be worth a thousand words. You have to think of your information as economics. Is that picture valuable enough to cost the extra time in loading the web page? More times than not, the answer to that question will be, “Yes!” But it is a question we must ask constantly. Our school page has been edited to load more quickly in figure 2.
My wife, who is a devout vegetarian, recently purchased a recipe book on sale at a local bookstore. This book has revolutionized vegetarian eating in my home. I spent at least an hour scanning through the book, marking recipes I wanted to try. Upon finishing, I realized, from the Post-its poking out from the pages, that I had marked well over half of the recipes. We went out a week later and purchased another book by the same author, and I marked most of the recipes there as well.

Several days later, I was thinking about this book, wondering what it was that made it so much better than the many other vegetarian cookbooks that we own, and it dawned on me. Our two new cookbooks have pictures. Each recipe includes a high quality photograph of the finished dish. Most books include only the text and perhaps some pictures. Those cookbooks tempt only the intellect. Our two new books tempt the senses, and this communicates.

This realization, to me, was a powerful illustration of the importance that multimedia plays in communicating ideas. If teaching our students to write effective paragraphs is all we have taught them to do in communication, then they will be severely unprepared.

Returning to the original idea, it is important to note that at the same time that images can be a powerful tool for helping you accomplish your goals, they can also be a powerful distraction for web visitors, defeating your goals.

The file type of your image has a lot to do with its size and the amount of time it takes to load through the Internet. The two image file types that are used in web pages are GIF (Graphics Interchange Format) and JPEG (Joint Photographic Experts Group). Some images produce small files when saved as GIF, while other result in smaller files when saved as JPEG. For instance, the picture of a schoolhouse on the right, drawn with a graphics program, is 10 kilobytes in size when saved as a JPEG file, and only 4 kilobytes when saved as GIF. On the other hand, images that have higher resolution, more colors, i.e., scanned photographs or pictures taken with a digital camera will produce smaller files when saved as JPEG.

4. **Use white space**

White space is not an absence of content. It is a design element that can be used to draw attention to content. If you have a block of information that you want the viewer’s eye to be drawn to, place a buffer of white space around it. If there is a bulleted list on a page that is of special importance to your web customers, place white space in front of the bullets.

Carefully placed white space can also give a web page a polished and professional look. Along with small and well designed images, white space can be used to give a web page a graphic intensive look, without taking a second longer to load.

It is also important to note the psychological effects of a page that is loaded with content. Most people who visit your page are busy. They want to find the answer to a question or solution to a problem. If, when they first lay eyes on your page they see that it will take time to read and sift
through a lot of information, they are most likely going to click the Back button and go somewhere else. Use white space to simplify your page, to cause ease in the minds of your visitors. See figure 3 for the effects of adding white space to your web page.

5. **Information layout and presentation – design for scanning**

Most people do not come to the Internet to read. They come to the Internet to learn. They are looking for information. If they want to read, they curl up by a fire with a good book.

People scan web pages rather than read them from top to bottom. This is why you should design your pages for scanning. Identify text that is obviously related to the questions or problems your visitors are probably trying to solve, and bold the text, or color it, or make it a different size. You want to distinguish the text from the surrounding information so that it will draw the scanning eye. You want to create eye magnets in your pages and use them to make the information easier to use.

Another technique for making pages more easily scanned is hanging indents. Headings and subheadings should be bold, perhaps larger, but also justified to the left of the screen (never center headings). The text or content beneath the headings should be indented. This way, the person who is scanning your page can easily pick up the headings to the left and then shift over to the content when they find something interesting.

Finally, use bulleted lists. Any list of items in your text that exceeds two items should be displayed as a bulleted list. For the mind of the web visitor to fully grasp the information, they need to know, without having to think, that the items are a list and that the items are of equal importance. If the items are in an order of importance, priority, or chronology, then make it a numbered list. This may seem obvious or trivial, but the more information about your information that you can convey to the reader at their initial glance, the more effectively you will communicate.

6. **Menu size**

Try to keep your page menus to less than seven items. People are less likely to read a long menu, which means that they are less likely to visit the valuable links from your page. If menus offer fewer than seven options, then people are more likely to read them and to click to other information on your site.

If you need to have more than six options from a single page, then have more than one menu listing. Select the most important options, the ones that would be most relevant to most of your readers, and make them a main menu with large and bold text, and attention grabbing bullets. This is the menu that would draw the reader’s eye. Then if they see value in your web site from this main menu, their eyes will wander to other less attracting menu listings.

7. **Page size**

Working a mouse is work. The less you make people use their mouse, the happier they are and the more positive their information experience. This requires that you make lots of decisions regarding page size. Your choices frequently are having a long web page that forces the reader to use his or her mouse to scroll endlessly down the page, or having lots of short pages, requiring the reader to navigate an information environment, clicking endlessly.
Usually it is preferable to have smaller pages. They are easier to manage for the reader and give a greater sense of logical organization. However, there are two very good reasons to go with longer pages. If the nature of the information and its use might cause the reader to scan the page for occurrences of specific words or phrases, then the long page has an advantage. The reader can use the Find feature that is in most browsers to search the entire contents of the page for the word or phrase.

Another advantage of longer pages is the ability to print them. If the information is such that it might be more valuable to the reader if it is printed, then a long page is preferable. If the information is divided into several shorter pages, then the user will have to print many times to get all of the information.

Another important consideration is the fact that most people do not scroll down the web page...at all. If they do not initially see obvious value in the page as it appears, then they go elsewhere. Therefore, the top six inches of your web page is the most crucial part. This is where you place your hook. This is where you advertise the information, convincing the reader that he or she should scroll further and start clicking.

Finally, A Classroom Web Site in about Fifteen Minutes

As we have discussed already in this book, the most important web sites for education may well be the classroom web site, built and maintained by the classroom teacher. There is enormous potential for improving student achievement with well maintained classroom web sites. At the same time, the economics of how teachers spend their time is an essential factor in the equation of learning. Therefore, we should probably conclude that the best, and perhaps only, viable solutions would be the free commercial web hosting environment or the locally constructed web-hosting environment. The later is ideal, but will take a good deal of time to implement.

Unfortunately, there are very few free services still available, yet one of the remaining opportunities offers a nearly ideal balance between powerful features, ease of use, and limited advertising. It is called TeacherWeb, and you can visit their service at:

http://www.teacherweb.com

Here is a TeacherWeb classroom web site created by Susan Oliver, a 4th grade teacher at Cannon School.

The most difficult parts of establishing your classroom web site with TeacherWeb are the first few mouse-clicks.

Establishing a TeacherWeb Classroom Web Site

1. Go to the front page of the TeacherWeb web site:

   http://www.teacherweb.com

2. Click the menu item, Create Your Web. On the following page, click Create Your Free TeacherWeb Site.
3. Pull down the drop-down menu in the middle of the page and select the state that you work in.

4. Pull down the drop-down menu on the next page to select your town or the name of your school. If you see neither, then type in the name of your town, or initials of your school in the textbox beneath the drop-down menu. Then fill in your name.

5. The next page will ask for information about your site, including:
   - The name to appear at the top of all web pages,
   - Your e-mail address and zip code,
   - Your school level (elementary, middle, high school) and your school colors,
   - Language, and
   - A password that will enable you to update your web site.

6. Now you have a classroom web site.

   On your initial classroom web site, you have:
   - an announcements page,
   - a page for homework assignments,
   - a links page for adding links to other web sites,
   - a frequently asked questions (FAQ) page,
   - a teacher page, and
   - a calendar.

Adding content and editing these web pages is simple. We’ll begin with the announcements page, which we might use to describe our current units of study.

Adding Content to Your Announcements Page

1. Click the icon for your Announcements page.

2. The page, at this point, has no content. There will be a colored or decorative bar above where the content will go, and a similar bar beneath the content’s position. Click the bar above the content’s position. This will load the edit page.

3. In the edit page, you have a scrolling textbox, within which you can add your content. This textbox will accept carriage-returns (<Enter> key), so you do not have to place the HTML paragraph tag (<p>) at the end of each paragraph. However, any other formatting will need to be indicated with HTML.

   Here is a sample text that we might enter into the textbox:

   **Welcome to Frank Warlick’s Social Studies Web Site. Here are the units we are currently studying in my eighth grade class:**
Math
We are currently studying percents and ways of using percents to communicate.

Language Arts
In Language Arts, we are reading a number of short stories about winter. Students are also working on technology skills (video production) by creating movie trailers for the short stories.

Social Studies
We are studying the countries of South America. We are also developing our writing skills by writing to a class in Peru, exchanging cultural characteristics of our lands.

Science
Students are learning about the planets. Teams of students are conducting research about each planet and will be presenting their planet to the entire class using Multimedia presentations.

Healthful Living
Ms. Mcleod is introducing students to archery this week.

4. Finally, you will need to enter your password in the small textbox beneath the content box. This assures that you are the owner of this site. Then click Submit.

5. Since you have included HTML in your entry, the system will issue a warning that the angle brackets you have included will be treated as HTML tags. This is fine. Simply click View your web page.

Visitors to your web site may be interested in learning what your students are studying at the present. However, a page called Announcements may not be the first place they will look. It would be useful if you could rename that page to Current Studies. There are ways to do a great deal of customizing of your TeacherWeb web site.

Advanced TeacherWeb
You can do a great deal of customizing of your classroom site by clicking the bottom bar on any of the classroom pages.

From the page that follows, you can make many minor and major adjustments to your classroom web site. Here you can:

• Edit any page in your site,
• Change your password,
• Print a handout with your web address to send home with students,
• Change the colors and graphic look of your pages,
• Edit personal information such as name and e-mail address,
• Add, delete, or rename pages in your site, and more.
The best way to take command of your TeacherWeb classroom site and customize it for your needs is through the Add/Delete/Rename Pages tool. When you click this button you have an opportunity to delete pages that you do not need, rename pages so that they will be easier to select by visitors, and even add a variety of new pages to your site.

The 9 pages listed in the illustration to the right are the standard pages. They are included in your web site if they are checked. If you would like to add a Grades page to your site, simply check it here. The middle column includes the standard page titles, but you can change the titles as they appear on your site using the form elements in the right column.

As I suggested before, it may be easier for web visitors to learn what is currently being studied in your classes if we rename the Announcements page to Current Studies. The resulting front page looks like this: