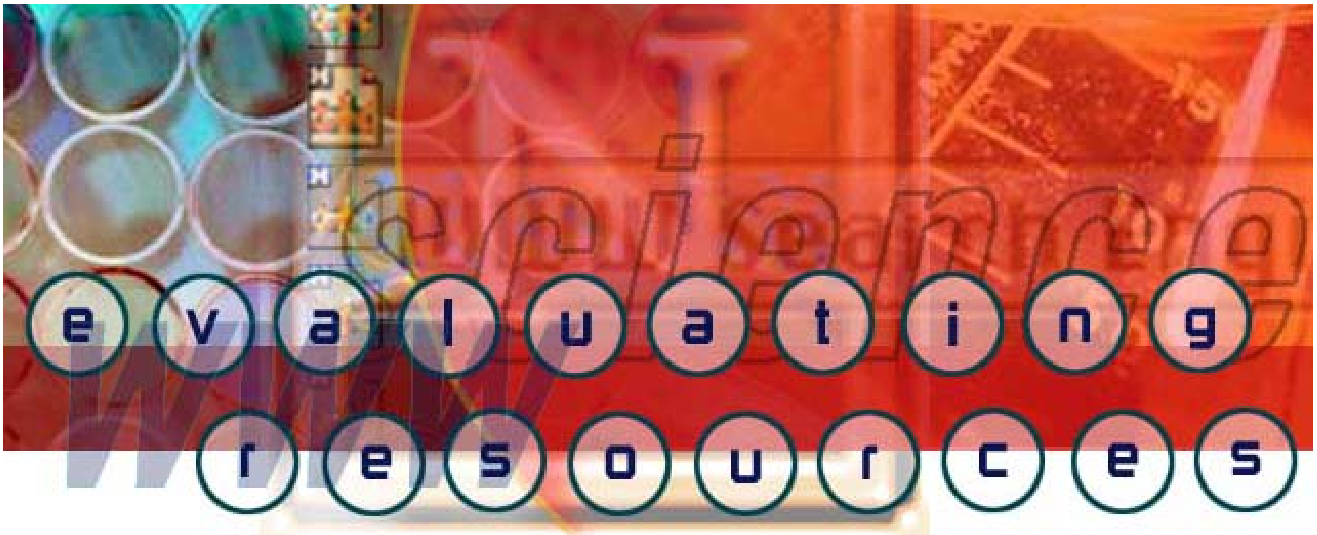
# Evaluating Science WWW Resources

ncsu.edu/imse/3/evalweb.htm




### I. Science Content Issues

1. Content accuracy.

Does the site contain accurate, reliable information or is the site full of science misconceptions? (Is the "Physics of Star Trek" the real deal?)

2. Responsible author.

Is there a way to validate the information at the web site? Is it clear who is responsible for the content? Can you contact the person who has written the information? Is there a way to e-mail a webmaster to ask specific questions? Often, biographical information of the author(s) is contained as a link somewhere within the web pages. If there doesn't appear to be any background information on the author, there is often a webmaster to e-mail for further information to clarify questions about authority. Researching the authority of a web site requires careful examination of the site.

3. Credentials of the author.

Is the content written by a scientist or another type of professional educator? Is the content biased to one point of view? Some web sites are known to advocate or support different causes and their biases are part of what we must keep in mind when we evaluate them. Some grassroots environmental organizations' on-line publications are slanted in a particular direction, just as one would expect from an activist group. Look at the viewpoint of the web site and analyze it.

4. Student engagement.

Does the content promote inquiry learning? Does the content encourage students to think and reflect? Are critical thinking skills needed to analyze and synthesize information? Is there a way students can be evaluated on their knowledge acquisition of the web site content using an on-line quiz or some other type of evaluation? Can students communicate with scientists or other field researchers at the web site? Does the site offer any other types of interactive opportunities for students such as data sharing with other students? Are students encouraged to transfer the scientific knowledge that they learn at the web site into a hands-on/minds-on science activity? Does the web site encourage collaboration with other students? Are students encouraged to continue exploration and research with additional hypertext links at the web sites? Are resources provided to facilitate students in developing their own online products or artifacts? Are there additional support materials for students to be involved in sustained inquiry activities both on-line and off-line?

5. Using the strengths of the web environment.

Does the web site present material just like a textbook? Then why not write a textbook! Are there special features included such as interactive animations, graphical organizers, concept maps, or graphs? Are the media elements, i.e. sound, video, graphics, well done and meaningful?

6. A level playing field.

Does the content promote multicultural science education? Is the content biased toward culture, gender or race?

7. Nature of the content.

Is the content comprehensive or cursory? Is the content appropriate for the grade level of the students? Is the math content appropriate for the grade level of the student? Is the content developmentally appropriate and relevant to your curriculum? Does the content support or enrich the curriculum? Is the content unique and not available elsewhere? For example, a web site which displays daily sea temperature readings in a graphical form is unique.

8. Dynamics of the site.

Is the content at this web site updated often? This is important for web sites which contain science datasets. New data should be appended periodically. Is this web site permanent? Many web sites change locations and often do not leave forwarding addresses?

9. References.

Are appropriate references and copyright statements included?

10. Reviews.

Has the content been through a peer review process?

## II. Navigation

11. Linking within and outside of the web site.

Can you move around the web site easily? Are there sufficient shortcut or hot buttons available? Are the navigation links visually obvious?

12. Site organization.

Does the home page contain a well-labeled table of contents?

13. Consistent appearance within the web site.

Are the navigation buttons consistent throughout the web site? Are navigation button labels confusing or obvious? Will your students be able to intuitively know what to click their mouse onto in order to navigate around the web site? Are the links clearly and accurately described? Hypertext links to other web sites frequently don't work at a web site that is not properly maintained.

14. Ease of browsing.

Do the links take you directly to the information or do you have to go through a series of mouse clicks to get to the information that you want?

15. Searching.

Are search engines included to assist you in finding the location of specific material?

## III. Web Site Design

16. Visual appeal.

Do the design and style of the site enhance information delivery? Is it innovative? Is the design layout visually pleasing?

17. Thematic design.

Is the design related to the science content? Is the design consistent for each web page within the web site?

18. Clarity of presentation.

Are the pages uncluttered and cleanly designed? Appealing web design features usually include tables and graphs. Some science web sites use frames which appear unappealing and cluttered.

19. Flexibility.

Is the web site designed to be viewed both by text browsers (Lynx) and graphics browsers (Netscape Navigator and Microsoft Internet Explorer).

20. Obtrusive frills.

Does the web site contain advertisements? Flashy advertisements may distract your students from the science content and slow down the browser.

21. Stimulation.

Does this web site get your attention? Will it get your students' attention and maintain their attention?

22. Appropriateness.

Is there appropriate use of graphics in the design layout?

## IV. Performance

23. Page acquisition time.

Does the site take a long time to load with the type of connection you are using in your classroom? Students do not have much patience (as well as the teachers) in waiting for web pages to load large graphics and will become distracted and lose interest easily. Caching items locally or using a web harvesting application such as WebWhacker can solve time-loading problems. Does the web site offer you a text-only option?Are there thumbnail versions of large graphics?

24. Connectivity.

Is the site usually accessible or is it difficult to connect into? Many NASA sites become very busy and difficult to access when new scientific discoveries are made. Some sites offer only a limited number of connections. Also, accessing sites overseas can sometimes cause long wait times for web page connecting and loading. Load time is important when considering the use of a site for a classroom demonstration. The best way to be safe with a demonstration is to harvest the web site locally and view it from your computer's hard drive or another external mass-storage device.

25. Hardware speed.

Consider your connection speed when you access a web site. Accessing large movie files with a 14.4 modem may not be worth your time unless they are extremely unique.

## V. Multimedia Issues

26. Problems of size.

Multimedia files such as videos, sounds, and animations are usually very large files and can take a very long time to download. It is recommended to download these types of files ahead of time and have students access them locally from a hard drive or mass-storage device.

27. Required applications.

Many multimedia objects on the World Wide Web require a helper application or plug-in. Some helper applications such as Shockwave requires an excessive amount of memory and time to load and run a multimedia animation. Make sure you have the appropriate helper application or plug-in loaded ahead of time before using these files with students. If you think a multimedia file is slow to load and run, so will your students.

28. Purpose of the multimedia.

Does the multimedia object promote learning or is it just a flashy novelty?

29. Real time communications.

Consider the pros and cons of using chat-rooms and video conferencing applications with students before engaging in these activities. Is the server you use available to the general public? Can anyone access your conversation? Is it worth the set up time to engage in such activities? Do you have enough bandwidth to maintain a reliable connection? Is this the only way you might be able to visit with a scientist or field researcher? Is this the only way your students can collaborate and share data with other students? Will using e-mail or electronic forums be a better alternative to live communication?

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