



LESSON PLAN

Level: Grades 7 to 10
About the Author: MediaSmarts

Deconstructing Web Pages



This lesson is part of *USE, UNDERSTAND & CREATE: A Digital Literacy Framework for Canadian Schools*: <http://mediasmarts.ca/teacher-resources/digital-literacy-framework>.

Overview

In this lesson, students apply the "5Ws of Cyberspace" to sources of information they find online. Assuming the role of a student researching a science project, students must authenticate the information in an online article about the artificial sweetener, aspartame.

Learning Outcomes

Students will:

- understand the importance of authenticating online resources
- recognize the signs of bias and omission in information
- use a template to authenticate Web sources based on site authorship or ownership, content and currency
- use meta-information search techniques to validate online information
- understand the structure of uniform resource locators (URLs) and how URLs can be used to determine authorship and credibility

Preparation and Materials

- students will need access to the Internet in order to complete their assignments

Photocopy:

- teaching backgrounder *Deconstructing Web Pages*
- student handouts *The Five Ws of Cyberspace* and *Deconstructing Web Pages* work sheet



Procedure

Assign note-takers to tally student responses on the board. Ask students the following questions:

- How many of you use the Internet for research and homework?
- Can you think of any advantages in using a library as a homework resource (either a school library or a public library) instead of the Internet? (*Sometimes it's better to have fewer choices! The amount of information on the Internet can be overwhelming. Libraries — especially school libraries — are usually **curated** collections, so there's less work to do in verifying your sources. Also, librarians are an essential resource in helping you find and verify information.*)
- What are the advantages of the Internet over more traditional resources?
- What are the disadvantages?
- What is the difference between publishing material on the Internet and publishing material in books? (*Traditional publishing incorporates a series of "gatekeepers" such as editors, proofreaders and fact checkers. On the Internet, authors can bypass these gatekeepers. As long as you have the technical know-how to create a web page, you can publish your thoughts online.*)
- How much of the information you find online do you think is true and can be trusted - all of it; most of it; some of it; none of it?
- Do you ever do anything to confirm that the information you have found online is true and can be trusted? (**Point for comparison:** *In MediaSmarts' Young Canadians in A Wired World (YCWW) survey, 89% of students said that they verify online information when it's for school work. However, significantly fewer students (66%) verify online information when it's for their own personal interest.*)
- For those of you who answered "yes," what do you do to check that the information you find online is reliable? (**Point for comparison:** *In the YCWW survey, the most common responses were: search inside a site and look at other sources to see if they say the same thing, 75%; see if the source comes from an expert, 59%; ask a teacher for good sites or to check a site, 54%; check to see if opinions are backed up by facts, 51% and check the date of publication or last update, 50%.*)

It's important that all of us - adults and young people- learn how to tell if online information is accurate and trustworthy.

Distribute the student handout *The Five Ws of Cyberspace* and review the main points with students.

Activity

- Individually or in pairs, have students complete the *Deconstructing Web Pages* work sheet.
- Once students have been graded and the work sheets have been returned, take up the answers as a class. (The teacher backgrounder *Deconstructing Web Pages* contains the answers to this assignment.)

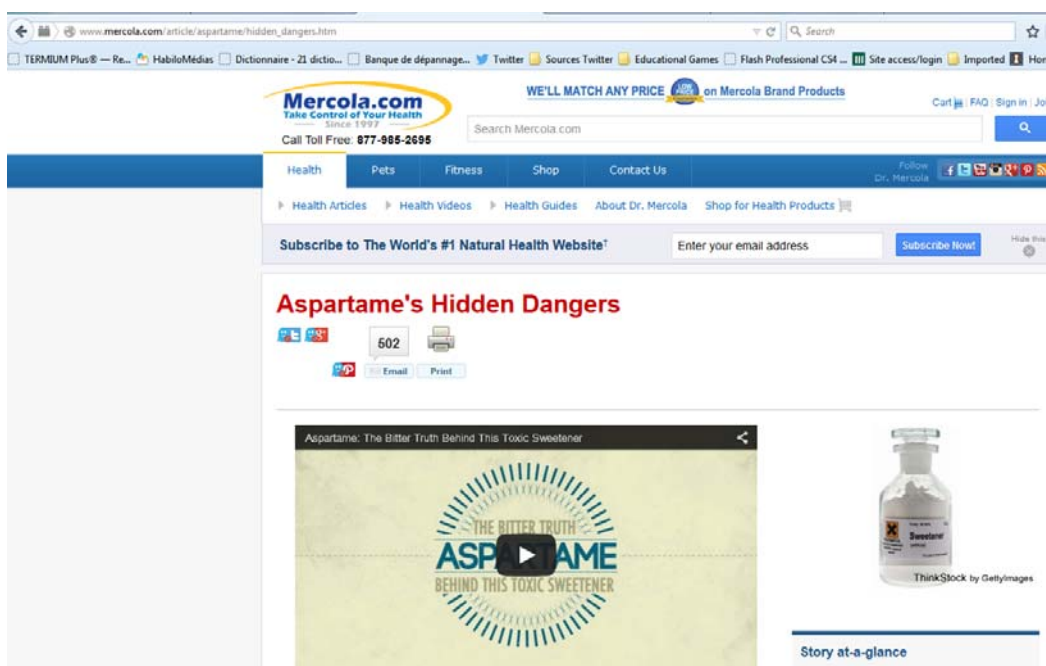
Evaluation

Completed work sheets



Deconstructing Web Pages

This exercise takes you step by step through the process of deconstructing a web page in order to determine its credibility as a source of information. Imagine that you're using the Internet to research a science project on the artificial sweetener, aspartame. If the first response to your Web search is the page shown here, you might want to run to your kitchen and toss out that can of diet Coke.



http://www.mercola.com/article/aspartame/hidden_dangers.htm

The content on the page displayed above was written by “Dr. Joseph Mercola”, who owns and operates “Mercola.com”, which refers to itself as “The World’s #1 Natural Health Website”. On this particular page about aspartame, Dr. Mercola quotes a number of experts who have discovered that:

- Aspartame is responsible for over 85 percent of adverse food reactions to food additives (this number is 75% in the video).
- Five people have died from aspartame poisoning.
- It is associated with birth defects, cancer, diabetes, multiple sclerosis, Alzheimer’s disease and many more.
- A conspiracy between drug and chemical companies prevents this from being known.
- Government leaders and medical associations are oblivious to this danger or have been manipulated.

Though these statements are passionate, further research is needed before accepting them as facts. Let’s apply the *Five Ws of Cyberspace*.

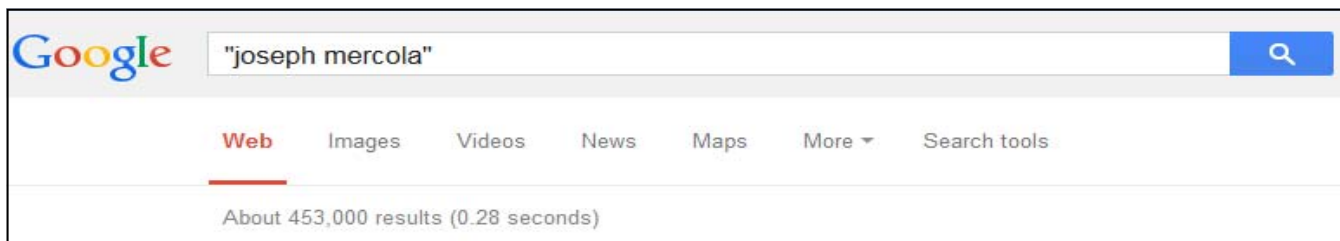




WHO

Who is Dr. Joseph Mercola and WHO sponsored his research? Is information about the author and research clearly stated or easy to access?

The “About Dr. Mercola” page reveals that Dr. Mercola is an “osteopathic physician”. According to the American Osteopathic Association, osteopaths “practice a ‘whole person’ approach to medicine. Instead of just treating you for specific symptoms or illnesses, they regard your body as an integrated whole.” The “About” page also lists his education and has a copy of his license to practice in the State of Illinois. He is also a Fellow of the American College of Nutrition.



So far, Dr. Mercola appears to be a qualified medical expert. A quick double-check of his license on the State of Illinois Department of Financial and Professional Regulation (at www.idfpr.com; the Department which grants licenses) confirms that Dr. Mercola is indeed a licensed physician in the State of Illinois.

Who funds or sponsors Dr. Mercola’s research? Dr. Mercola states that he funds his own research through his website and the products he sells. In this way, Dr. Mercola claims that he is not “handcuffed to any advertisers, silent partners, or corporate parents.” It is worth noting that he does sell a book about the dangers of artificial sweeteners, which includes aspartame.



WHAT

What are you getting? Is the information biased? Does the site use loaded language or make broad unsubstantiated claims? Can the information be verified through other sources?

Let's check some of the statements made by Dr. Mercola for bias:

The American Diabetes Association (ADA) is actually recommending this chemical poison to persons with diabetes...

How aspartame was approved is a lesson in how chemical and pharmaceutical companies can manipulate government agencies...

Even today, nothing is done to prevent aspartame from inflicting damage on the health of the American population...

Dr. Mercola uses emotional language to persuade his audience and to create a sense of urgency about spreading this message to a largely unsuspecting public. He makes strong assertions, but does so using vague language and anonymous sources. He implies that:



- aspartame kills brain cells:
For the people who have killed a significant percentage of their brain cells and thereby caused a chronic illness, there is no way that they would normally associate such an illness with aspartame consumption.
- aspartame manufacturers know it is a harmful product and are covering up that fact for financial reasons:
Many organizations and universities receive large sums of money from companies connected to the NutraSweet™ Association, a group of companies promoting the use of aspartame. In January 1993, the American Dietetic Association received a US\$75,000 grant from the NutraSweet™ Company.

It's important to note the information gaps in statements like these. This article appears to contain an abundance of attributed information, but there are very few links to factual evidence to substantiate claims. Dr. Mercola blames aspartame for a host of illnesses and mentions a lot of research and researchers, but provides no links or citations for most of these.

A critical reader might wonder why, if aspartame is responsible for so many serious health problems, Canadian and American medical associations have not raised the alarm. Because he repeatedly implies that the FDA, the agency responsible for protecting the health of the public and for monitoring substances like aspartame in the U.S., is either incompetent or corrupt, and because he specifically mentions connections between aspartame, cancer and multiple sclerosis, it might be a good idea to see what other organizations have to say about it:

On its website, Health Canada states that in addition to the extensive testing it has done that determined the safety of aspartame, "...other scientific advisory bodies such as the Scientific Committee for Food of the European Community, and the Joint Expert Committee on Food Additives (JECFA) of the United Nations Food and Agriculture Organization and World Health Organization have reviewed all the available safety studies and have found aspartame to be safe" and that more than 90 countries around the world have also reviewed aspartame and "found it to be safe for human consumption and allow its use in various foods." (<http://www.hc-sc.gc.ca/fn-an/secureit/addit/sweeten-edulcor/aspartame-eng.php>)



In 2013, the European Food Safety Authority re-tested the safety of aspartame and found that "aspartame was not of safety concern at the current aspartame exposure estimates." (<http://www.efsa.europa.eu/en/efsajournal/doc/3496.pdf>)

The National Multiple Sclerosis Society states that "No scientific evidence supports the claims that aspartame — an artificial sweetener used in many diet soft drinks and other foods — causes MS." (<http://www.nationalmssociety.org/What-is-MS/What-Causes-MS/Disproved-theories>)



The American Cancer Society's page dedicated to aspartame and its potential side effects cites many researchers attesting to its safety. For example: "In the largest study of this issue, researchers from the NCI (National Cancer Institute) looked at cancer rates in more than 500,000 older adults. The study found that, compared to people who did not drink aspartame-containing beverages, those who did drink them did not have an increased risk of lymphomas, leukemias or brain tumors."



Even if Dr. Mercola is correct about the FDA, all these organisations and countries would have to be corrupt and/or incompetent in order to support his general claims about the danger of aspartame.



When was this article posted? Is it current? Has it been updated?

Although the "Whats" are certainly enough to make you question the information on this web page, let's follow through on the other Ws, to see what we come up with.

Questions about the currency of this information also bring up some interesting points. There is no date on the page to show when the article was written or when it was last updated. Of the two dozen or so dates relating to the research or articles, all but three are before 1996. The most recent date on the page is a reference to a 2010 paper from Yale University, indicating that at least some of the information on this page is no older than 2010. While this is not a universal practice, some websites (such as Health Canada) provide a date of when the page was last modified on every page. Keep an eye out for this date as it can help you quickly evaluate how recent information is.

Although part of the purpose of this article seems to be to give some historical context to aspartame, Dr. Mercola's supporting evidence for its detrimental health effects seem dated: the effects on birth defects cite a book first published in 1982 and last updated in 2002; the section about the link with brain cancer refers to research done from the mid-1970s to 1981; the section on aspartame and diabetes does not provide dates for the research mentioned; the section on aspartame's effect on emotional disorders cites two sources from the mid-1990s; and the section on epilepsy and seizures cites magazine articles ranging from 1988 to 1993 and a paper from 1986.



Where is this web page located? What's the nature of the site? Is it a personal home page? Is it part of a medical site? The article on this web page discusses the link between aspartame and Multiple Sclerosis, so is it part of the Multiple Sclerosis Foundation's website?

The original page where we found this information about aspartame was on Dr. Mercola's commercial website www.mercola.com/article/aspartame/hidden_dangers.htm. By looking at the rest of the site, we can learn more about its nature and possible motives. As we mentioned earlier, this website claims to be "The World's #1 Natural Health Website." What we actually find are several articles, videos, guides, eBooks, links and commercial products related to a wide range of health topics that includes allergies, aspartame, cancer, fluoride, sugar, genetically modified organisms (GMO), mercury in dentistry, vaccines, vitamin D and many others. Not all of this information comes from Dr. Mercola; there are other contributors as well.

It is worth noting that many of the topics covered here are contentious issues that are often the subject of debate between the scientific and medical communities and some members of the public. The information on Dr. Mercola's website about these topics is often contrary to scientific consensus and accuses organisations and experts who disagree that aspartame poses health risks of negligence, incompetence and covering up something.



Why would I use this site as a credible source? Can I verify the information I've found?

The question that remains to be asked is WHY would we think this site is a credible source of information? In researching this topic, we've learned a number of things:

- First, there are individuals and organizations that believe aspartame poses a health risk.



- Second, this belief is not shared by the medical profession at large and claims about the risks associated with aspartame have not been clinically proven.

It's safe to assume that the individuals who believe that aspartame is dangerous are sincere. It would also be accurate to use this website as an example of one side of the aspartame debate. However, with few verifiable facts available to support the statements made by Dr. Mercola, and a fair bit of confusion regarding the authorship and credibility of this article, it would be smart to pass on this web page as an authoritative source of information.



The Five Ws of Cyberspace

The old formula used by police, journalists, and researchers – Who, What, When, Where, Why, and How – can be applied in cyberspace to help identify credible online information sources.

KNOWING WHAT'S WHAT AND WHAT'S NOT
THE 5 W'S (AND 1 H) OF CYBERSPACE

Ask yourself:



WHO is the source of the information?

- Has someone taken responsibility for the content of this website?
- Is information about the author or organization clearly stated?
- Are there any links to in-depth information about the author or organization?
- Can you contact the company or author through a real world postal address or phone number?
- Can you confirm that the company or author is a credible authoritative source of information?
- Can you verify the authority of any of the site's content that is attributed to other sources?
- Is the information biased in any way?
- Does the site rely on loaded language or broad unsubstantiated statements?



WHAT are you getting?

- Is emotion used as a means of persuasion?
- Does the site offer more than one viewpoint?
- Are there links to other or alternative viewpoints?
- Does the site's information seem thorough and well organized?
- Does the site clearly state the topics it intends to address?
- Does it follow through on the information it has promised?
- Does the information seem complete and consistent?
- Is the information well written and easy to understand?
- Does the site offer a list of further in-depth resources or links to such resources?
- What is the copyright status of material found on the site?





WHEN was the site created?

- Is it important that the information you're looking for be absolutely current?
- Is a reference date provided to show when the material was put online or when it was last updated?
- Do the links work?



WHERE are you?

Learn to deconstruct a Uniform Resource Locator (better known as a URL, or "site address"). Let's use the MediaSmarts URL as an example:

<http://www.mediasmarts.ca/teacher-resources/licensed-resources>

<http://www>.

The "http" notation indicates that this is a hypertext document (as most online documents are). The "www" is short form for "World Wide Web," where all websites reside.

[mediasmarts.ca](http://www.mediasmarts.ca)

The second part of a URL contains the domain name of the person or organization hosting the website – in this case, mediasmarts. The ".ca" which follows indicates that the site is hosted by a Canadian organization.

[teacher-resources/licensed-resources](http://www.mediasmarts.ca/teacher-resources/licensed-resources)

The last section maps out the pathway of directories and sub-directories leading to the page you are on. For this particular page on the MediaSmarts site, "teacher-resources" indicates that you are in the section of the site that holds resources for teachers. The final URL entry ("licensed-resources") indicates the name of the page or document you have arrived at.

~ Sometimes you might see a "user" reference or tilde (~) symbol in a sub-directory, followed by a name. This indicates that you may be on a personal Web page that is hosted by an ISP (Internet Service Provider).



The type of organization behind a website can give some clues to its credibility.

- .gov** In the U.S., .gov applies to federal departments. In Canada, provincial governments use .gov followed by a provincial or territorial abbreviation and .ca.
- .gc** The federal government in Canada uses .gc in its domain name and in the domain names of many of its departments, such as Industry Canada and Canadian Heritage. However, some government websites, such as the Canadian Human Rights Commission (www.chrc-ccdp.ca), opt for just .ca.
- .ca** The Canadian Internet Registration Authority (CIRA) is the non-profit corporation responsible for overseeing and keeping a registry of the “.ca” Internet country code domain for Canada. Schools, educational organizations, libraries, museums, and some government departments may be registered under a 2-digit country-of-origin code, such as .ca, .uk or .au. However, it's important to remember that any Canadian organization can obtain a .ca domain.
- .edu** The U.S. originally created .edu to indicate American colleges and universities offering 4-year degree programs. Most Canadian universities tend to use .ca.

.org **.com** **.net**

Back in the early days of the Web, *.org* indicated a wide assortment of groups, including non-profit organizations; *.com* indicated commercial organizations; and *.net* was intended for organizations directly involved in Internet operations, such as Internet service providers.

Now, anyone can apply for and use these letters in their domain names. For example, the YWCA website in Oakville ends with *.com*, in Vancouver, it ends with *.org*; and in Montreal it ends with *.ca*.



WHY are you here?

Before you saddle up and ride out into cyberspace, it's a good idea to stop and consider whether or not the Internet is even the best place to go. Ask yourself:

- Can I get the information faster offline?
- Does the online material I'm finding suit my needs?



HOW can you tell what's what?

- When in doubt, doubt. Scepticism should be the rule of thumb on the Internet.







- Apply the *Five Ws* of cyberspace to the websites you visit.
- Double-check your facts and sources – and then check them some more!
- Use Meta-Web information searches to assess the credibility of websites. This can be done by entering the author's name into a search engine to conduct a quick background check. Or you can find which sites link to a specific site by going to a search engine and entering a "link:" command in the "Search" box, followed by the page's URL.



Deconstructing Web Pages Work Sheet

This exercise takes you step by step through the process of deconstructing a web page in order to determine its credibility as a source of information.

Use these icons to guide your work:

	Read and think about what's being said
	Search for something on the Internet
	Record your findings. Be specific!!
	Stop, reflect and write!



Imagine that you have to research a science project on the artificial sweetener, aspartame. You come across an article that is identified as an evaluation of the safety of aspartame by a licenced medical professional named Dr. Joseph Mercola on "The World's #1 Natural Health Website".



View the page at http://www.mercola.com/article/aspartame/hidden_dangers.htm



List 5 specific troubling effects of aspartame mentioned by Dr. Mercola:

1. _____
2. _____
3. _____
4. _____
5. _____



What are you thinking about aspartame right now?





Though the statements by Dr. Mercola are passionate, further research is needed before accepting them as fact...

Let's ask some questions...

Who?



Who is Dr. Joseph Mercola and who sponsored his article titled "Aspartame's Hidden Dangers"?

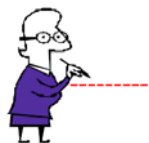
Is information about the author and the sources for the article clearly stated or easy to access?

Dr. Mercola provides a lot of information on his credentials and motivations. However, a Web search can be used to dig a little deeper and verify what he says.



Using the search engine Google, **search** for the name "Dr. Joseph Mercola."

Visit several of the resulting sites.



List several key points of information you discovered about Dr. Joseph Mercola:



What?

What are you getting?

Is the information biased?

Does the site use loaded language or make broad, unsubstantiated claims?

Can the information be verified through other sources?



What about the references Dr. Mercola provides?

Most of the sources for the claims that are made are about 20 years old. Some are even close to 40 years old! A lot of research has been done since then. Have a look at the very first reference Dr. Mercola provides (source “i”, titled: “Critical Reviews in Toxicology”, dated 2007. This is provided to substantiate the claim that aspartame is in over 6,000 products, which it does. But look at what the abstract actually says about aspartame!)



What did you discover?

Let’s check some of the statements made by Dr. Mercola for bias...

“The American Diabetes Association (ADA) is actually recommending this chemical poison to persons with diabetes...”

“How aspartame was approved is a lesson in how chemical and pharmaceutical companies can manipulate government agencies...”

The speaker uses emotional language to persuade his audience and create a sense of urgency about finding out more about the dangers of aspartame. He makes strong claims, but does so using vague language and sources of dubious quality. He implies that:

1. Aspartame causes multiple sclerosis.

“... Chronic exposure to this sweetener can bring about or worsen serious conditions such as... multiple sclerosis...” (from the video)

2. Aspartame causes brain cancer.

“In a two-year study conducted by the manufacturer of aspartame, twelve of 320 rats fed a normal diet and aspartame developed brain tumors while none of the control rats developed tumors, and five of the twelve tumors were in rats given a low dose of aspartame.”

It’s important to note the information gaps in statements like these. This website contains an abundance of attributed information, but very little direct links to actual, modern research to substantiate the claims.

Dr. Mercola blames aspartame for a host of illnesses and mentions lots of research and researchers, but provides no links or references for most of these.

A critical reader might wonder why, if aspartame is responsible for so many serious health problems, Canadian and American medical associations have not raised the alarm.

Because he repeatedly implies that the FDA (the agency responsible for protecting the health of the public and for monitoring substances like aspartame in the U.S.) is either incompetent or corrupt, and because he specifically



mentions connections between aspartame, cancer and multiple sclerosis, it might be a good idea to see what other organizations have to say about it:

Visit these organization websites and **record** what they have to say about the aspartame connection.



Health Canada http://www.hc-sc.gc.ca/fn-an/securit/addit/sweeten-edulcor/aspartame-eng.php	
The National Multiple Sclerosis Association http://www.nationalmssociety.org/What-is-MS/What-Causes-MS/Disproved-theories	
European Food Safety Authority http://www.efsa.europa.eu/en/efsajournal/doc/3496.pdf	
American Cancer Society http://www.cancer.org/cancer/cancercauses/othercarcinogens/athome/aspartame	

When?



When was this article posted?

Is it current?

Has it been updated?

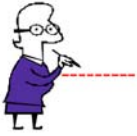
Although the “Whats” are certainly enough to make you question the information on this web page, let’s follow through on the other Ws, to see what we come up with.

Questions surrounding the currency of this information also bring up some interesting points.



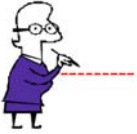
Visit the original web page where this information was found was at www.mercola.com/article/aspartame/hidden_dangers.htm





When was this article posted?

Further investigation shows that many, if not most, of the references on this page are more than 20 years old.



What are the dates (the year) of the research presented on this page?



Why is knowing the date of the information important?

Where?



Where is this web page located? What's the nature of the site? Is it a personal home page?

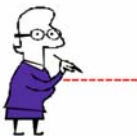
Is it part of a medical site?

The article talks about the link between aspartame and multiple sclerosis, so is it part of the Multiple Sclerosis Foundation's website?

Where is this web page located? The original page where we found this information about aspartame was at www.mercola.com/article/aspartame/hidden_dangers.htm



Pare this URL down to its base: www.mercola.com to learn more about the nature of the website hosting this information.



What did you discover?

Why?

Why would I use this site as a credible source of information?

Can I verify the information I've found?

The question that remains to be asked is WHY would we think this site is a credible source of information?



In researching this topic, we've learned a number of things:

- First, there are individuals and organizations that believe aspartame poses a health risk.
- Second, this belief is not shared by the medical profession at large and claims about the risks associated with aspartame have not been clinically proven.

Remember that your project was to research a science project on the artificial sweetener, aspartame.



It's safe to assume that the individuals who believe that aspartame is dangerous are sincere.

It would also be accurate to use this website as an example of one side of the aspartame debate.

Look through this packet again. Summarize the main reasons this website might not be the 'best' source of information on the topic.

Adapted by Information Literacy teacher Heidi Erstad, of Eisenhower Middle School in New Berlin, WI, from MediaSmarts' "Getting the Goods: Deconstructing Web Pages" tip sheet.

