

RESEARCH AND PUBLIC PRESENTATION

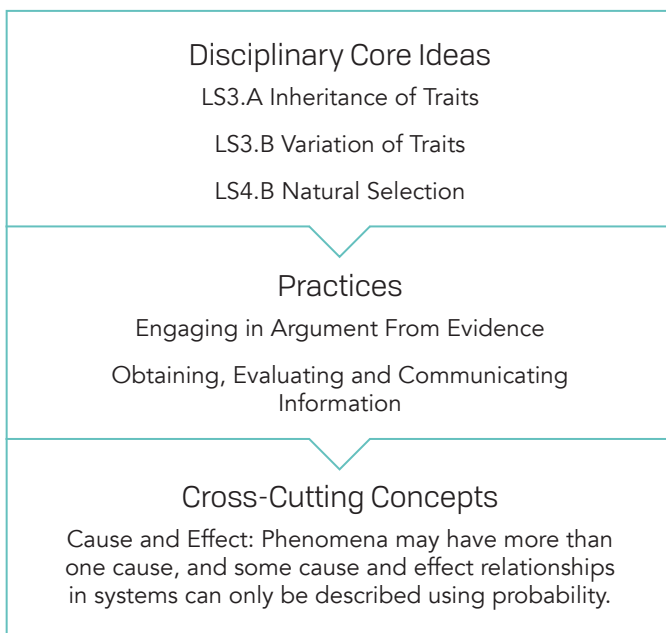
LENGTH: 1 hour plus additional research and presentation time

OBJECTIVES: Students will be able to:

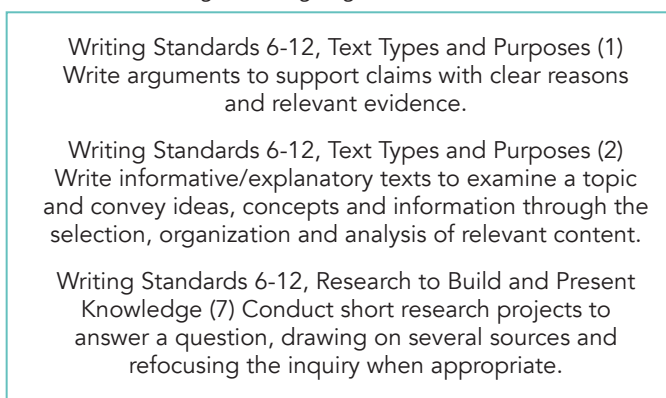
- distinguish between fact and opinion
- use a credibility checklist tool to evaluate online media
- analyze information gathered or provided and categorize it as fact or opinion
- form an opinion on biotechnology, genetic engineering and labeling foods from genetically engineered ingredients using the information gathered
- write an essay expressing their opinions using correct form, grammar and spelling

Standards:

Next Generation Science Standards Addressed



Common Core English Language Arts Standards Addressed



Materials:

- Copies of Final Project Student Handout: Credibility Checklist (1 per student)
- Copies of Final Project: Student Rubric (1 per student)

KEY CONCEPTS: In our democratic society, all people are urged to be responsible citizens. This responsibility involves a willingness to become informed and involved and the willingness to take action. This lesson, designed to illustrate and encourage responsible citizenship, shows students how to become educated about an issue, examine evidence on all sides of the issue from credible sources and establish a personal position on the issue supported with factual information.

Students will apply knowledge gained from lessons within this unit and utilize the credibility checklist to evaluate information on a relevant issue. Students will have an opportunity to present their report to individuals from outside their classroom (e.g., other teachers, administrators, community members, agriculture industry representatives, etc.) and engage in meaningful dialogue.

SETUP: Secure access to student computers and prepare Final Project: Student Rubric. Identify members to engage in a listening panel for student presentations.

Outline:

1. Set context for the culminating project by reminding students that they have a tremendous opportunity to engage in their community and our country by voicing their opinion. Understanding the strategies for effective communication of opinion and fact is important for students, as consumers and communicators.
2. Ask students to think about where they get their information on a daily basis. As students share, create a list on the board.
3. Have all students stand along one wall in the classroom. Inform students that one corner of the room represents highly reliable sources — sources you would trust more. Point to the opposite side of the room and tell students that this corner represents unreliable sources — sources you would trust less. Ask students to move in the classroom toward one side or the other, based on how reliable they feel each type of information source is.
 - Note: Begin with easy comparisons and gradually work toward more challenging comparisons. It is ok for students to have different opinions about credibility at this stage. The purpose of this activity is to engage critical thinking in preparation for the next step.
 - Sample lead-in examples: teacher (reliable), used car salesman (unreliable), someone next to you on the bus (unknown reliability), your doctor (reliable).

4. Ask students why it is often hard to assess reliability. Help students discover on their own that reliability of information on a topic is often dependent on the topic itself. For example, you might go to a professional baseball player for reliable information on how to hit a baseball, but just because they are successful in sports does not necessarily make them a reliable source of information on science. Social media and marketing often confuse this situation even more.
5. Inform students that you have a tool that will help them assess the reliability of information in many areas, especially science. Distribute student handout Credibility Checklist. Have students preview the checklist and clarify questions.
6. In class or as a take-home exercise, have students complete the credibility checklist for a website related to biotechnology. You may wish to have students search on their own to show a broad variety of sources, or you may wish to direct students' attention to a reliable database of information found at <http://www.geneticliteracyproject.org/external-resources-links/>.
7. Assess students' knowledge of the difference between facts and opinions. Define and discuss the differences. (Facts are neutral statements that can be proven. Opinions are points of view, judgments or conclusions.) Explain that opinions are sometimes stated as facts, but that does not make them facts. For example:
 - **Fact:** Many groups use fresh water.
 - **Opinion:** I believe farmers should be able to use as much water as they need.
 - **Opinion Stated as Fact:** It is important for urban areas to have priority in decisions about water use.
8. To reinforce students' understanding of the difference between topics and issues, have students identify the topic in the above example (water use). Then have them state the issue (allocation of water).
9. Explore the tone that writers or speakers use when discussing issues. The tone is the attitude or emotion conveyed toward the subject. With advanced students, discuss the use of the techniques of sidestepping and emotional appeal. For example, a writer debating allocation of water sidesteps the issue when he or she discusses levels of water pollution.
10. Have students work independently or in pairs to find an article online about labeling genetically modified organisms. Ask students to scan the article for facts, opinions and opinions stated as facts. Ask students to share aloud. Capture examples and discuss the importance of being able to read with this "filter" in mind.
11. Have students identify the effect of this article. What does it prompt the reader to do, think or feel? Next, have students identify the cause of that effect. What strategies did the writer use to elicit that response?
12. Help students understand that there are often many sides or positions about an issue. Ask students the following questions with regard to public acceptance of genetically modified organisms.
 - *Are there more than two sides to your issue? How many positions are there?*
 - *What are some of the different positions about your issue?*
 - *What areas of agreement exist between the different positions about your issue?*
 - *What are the exact differences which make it so difficult for individuals or groups to agree?*
13. Distribute Final Project: Student Rubric to students. Students will draft a short research paper sharing facts about both sides of the issue and their opinion about labeling of genetically modified organisms. Discuss rubric and address questions.
14. Allow student work time and clarify expectations for work done outside of class.
15. After research papers are complete, facilitate a presentation event where students share their papers to people beyond the students' classmates and engage in meaningful dialogue.

Research Tips:

You can quickly find peer-reviewed research using Google Scholar <http://scholar.google.com/>. Want to stay updated on a specific issue? Click on the "Alerts" tab to create an alert for a search topic.

You can also evaluate the credibility of a journal or publishing house by consulting one of the following:

http://www.researchgate.net/post/Where_can_I_find_journals_list_sorted_by_impact_factor_in_Thomson_Reuters_website

<https://predatoryjournals.com/journals/>

NAME: _____ DATE: _____ CLASS PERIOD: _____

CREDIBILITY CHECKLIST

Every day we are presented with information. We must determine if the information is valid or biased. As you take in new information, use this checklist to help determine credibility.

- Source/Website Link:

- Title of Article/Website:

- What can you learn from the web address (.com = company, .edu = academic institution, .gov = U.S. government agency, .mil = U.S. military site, .org = nonprofit)?

- Is there a bibliography included to reference the source(s) of the information?

- If so, are the sources credible?

- Are you able to identify an organization or person responsible for the information?

- What is the track record of the organization sharing the information?

- By what authority are they making claims? Is it research based?

(continued)

NAME: _____ DATE: _____ CLASS PERIOD: _____

Credibility Checklist (Continued)

- Is the information shared factual or opinion?

- How long has the organization been in existence?

- What is the organization's purpose?

- Who funds the organization?

- When was the site last updated?

- Does the site have working links to external web pages?

- Is there contact information to follow up with the organization?

GRADING RUBRIC – FOR TEACHER

Credibility checklist is thoroughly completed for the selected site.

Score _____ / _____

NAME: _____ DATE: _____ CLASS PERIOD: _____

Score _____ / _____

	ADVANCED	PROFICIENT	NOVICE
Description of "GMOs" and biotechnology	Distinction is made between different processes of genetic modification. Biotechnology is clearly explained including the history and evolution of the science.	Genetic modification is explained at a high level without comparison of processes.	Genetic modification and biotechnology are not explained.
Facts are included and referenced from reliable sources.	Ten or more facts are included with citations listed from reliable sources.	Five to nine facts are included with citations listed from reliable sources.	Facts are omitted and/or a majority of sites are not reliable.
Opinion is expressed on the topic of "GMO" labeling.	The student expresses his/her opinion without passing opinion as fact. The opinion is supported by fact.	The student suggests an opinion but may not clearly make a case for this opinion.	The student does not clearly express his/her opinion.
Grammar, punctuation and fluidity	The student writes with fluid tone, correct grammar and punctuation.	Minor grammar or punctuation errors exist in the paper.	There are significant grammar and/or punctuation errors in the paper.
Presentation	The student confidently presents his/her paper, including fact and opinion.	The student presents portions of his/her paper.	The student does not present his/her paper to the selected audience.

NAME: _____ **DATE:** _____ **CLASS PERIOD:** _____

STUDENT SELF-REFLECTION TOOL

You have an opportunity to brag about your learning! Take a look at the rubric for this lesson. For each section below, tell me what proficiency level you believe you have demonstrated and why.

<p>DISCIPLINARY CORE IDEAS</p>	<p>Proficiency Level I have reached:</p> <p><input type="checkbox"/> Novice</p> <p><input type="checkbox"/> Proficient</p> <p><input type="checkbox"/> Advanced</p> <p>Why?</p>
<p>PRACTICES</p>	<p>Proficiency Level I have reached:</p> <p><input type="checkbox"/> Novice</p> <p><input type="checkbox"/> Proficient</p> <p><input type="checkbox"/> Advanced</p> <p>Why?</p>
<p>CROSS-CUTTING CONCEPTS</p>	<p>Proficiency Level I have reached:</p> <p><input type="checkbox"/> Novice</p> <p><input type="checkbox"/> Proficient</p> <p><input type="checkbox"/> Advanced</p> <p>Why?</p>