News Literacy Model Curriculum in Science

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A Note for Teachers

The lessons in this guide were developed by a team of veteran science teachers from across the country. They are designed to represent the multitude of ways in which news literacy concepts can be incorporated into science classrooms at all grade levels. Lessons are aligned to Common Core State Standards and are created to be flexible and to be used independently or in concert with other lessons. In addition to the content standards listed for each lesson, these lessons also meet the following Partnership for 21st Century Skills (P21) framework:

Skills	*P21 outcomes*
Critical Thinking	1. Reason effectively 2. Use systems thinking 3. Make judgments and decisions
Communication	1. Communicate clearly
Information Literacy	1. Access and evaluate information 2. Use and manage information
Media Literacy	1. Analyze media

Please note that because of copyright restrictions, some supplementary lesson materials appear as links to outside content. We encourage you to scale up or scale down each lesson as appropriate for your students.

News Literacy Framework

For each lesson, you'll find a recommended time frame, materials, and a detailed instruction plan that walks you step-by-step through the lesson. Most importantly,

you'll find learning objectives that specify which content-based skills are addressed and which core news literacy question is used to guide the lesson.

Each lesson is aligned to one of the four guiding news literacy questions, established by the News Literacy Project:

1. Why does news matter?
2. Why is the First Amendment protection of free speech so vital to American democracy?
3. How can students know what to believe?
4. What challenges and opportunities do the Internet and digital media create?

These questions supply the framework through which students develop, practice, and apply their science skills in a news literacy context. In doing so, we believe students will make more meaningful connections between this core subject area and the ever-changing media world in which they live.

News Literacy Model Curriculum in Science Grades 7/8

Lesson 1: Really?! I'm Eating What?!

Lesson 1

Really?! I'm Eating What?!

This lesson is inspired by a TED Talk from Michael Pollan, the author of Omnivore's Dilemma, and movie excerpts from Food, Inc. This lesson emphasizes the need for students to use critical thinking in science (ecology, health, evolution) and the information in the news in order to become more science literate. This lesson introduces questions derived from essential news literacy principles and encourages students to ask questions about who is producing the news, whether it is biased, and what consumers should be asking in response to the information they encounter. This lesson is aimed at seventh-grade life science students and incorporates the analysis of reading/news/video media. A culminating essay gives students practice in collecting evidence and evaluating information.

Grade Level: 7/8
Estimated Time: 3-7 class periods (depending on student levels)

Learning Objectives
Students will:

- Understand that becoming informed is not simply a passive activity but requires personal engagement.
- Learn to evaluate the source of information and whether it is biased.
- Develop critical thinking skills to question information provided by news sources — in print, online, and through video.

Guiding News Literacy Question: How can students know what to believe?
The politics of food and food product regulation are becoming increasingly complicated. Young adults are expected to have a greater awareness of where their food comes from, its nutritional value, and how to maintain a balanced diet. Learning to read food labels, and understanding expert opinions as conveyed through media such as documentaries, is an essential step in this process.

Common Core State Standards

CCLS 7th Grade Logic Standard	Determine simple criteria for recognizing factual claim and opinion (e.g., scientific method, provability, quality of evidence, sources).
RI.7.1	Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
W.7.2	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

RI.7.10	By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Next Generation Science Standards

Developing and Using Models	Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop and use a model to describe phenomena. (MS-LS1-2)
Engaging in Argument from Evidence	Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). • Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3)
Obtaining, Evaluating, and Communicating Information	Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods. • Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS1-8)
Crosscutting Principles	Science is a Human Endeavor • Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (MS-LS1-3)

Preparation and Vocabulary

Students need to know this vocabulary: sustainable, food chain, monoculture, agricultural revolution, herbivore, carnivore, omnivore, industrial revolution, agricultural evolution, and minimal organic chemistry terms such as glucose and fructose. It is recommended that students know what the word *bias* is and the difference between fact and opinion.

Teachers should preview the videos and resource section.

Students or teacher needs to bring in a food item from home—almost anything works. In the mix should be natural foods and processed foods with food labels. Ones that may be interesting to bring would be toothpaste, as this item also includes corn products.

Copy handouts for each day and ensure the online videos are cued up and available for when discussion ends to make for a seamless transition.

Materials
Computer with projector to project the videos for student viewing
Teacher and student handouts/worksheets
Clip from "Fast Food Nation" movie (can buy at http://www.takepart.com/foodinc or on Netflix)

Websites and Additional Resources
Corn-derived ingredients and interactive:
http://tiger.towson.edu/~kwynn1/art365/projectb/ingredients.html

POV PBS List:
http://pov-tc.pbs.org/pov/pdf/foodinc/foodinc_corn_derived_handout.pdf

Good video from Michael Pollan regarding the relationship with plants – to be used as an offshoot of botany and evolution:
https://www.ted.com/talks/michael_pollan_gives_a_plant_s_eye_view

Modifications
If you are unable to acquire the "Fast Food Nation" video, an alternative video with similar topics for discussion can be found on PBS. This is an interview with the maker of the film "Food, Inc.," Robert Kenner. His commentary reflects the same mission (or bias/agenda) of the movie "Fast Food Nation." Kenner's interview is available at http://video.pbs.org/video/1143263943/.

If you decide to use a different video, find the key discussion questions regarding the aim of the video and have students question what they are witnessing with questions from the Evidence Collection worksheet.

Instructional Plan

Day 1: What is news literacy?
To begin, have a discussion with students on the basics of news literacy. Depending on your student population, use one of the following handouts to facilitate this discussion:

- *News Literacy Principles and What it Means* — Use this document to have students and teachers read and "unpack" the key concepts of each principle and to address key vocabulary. Have the students highlight key concepts and circle words they do not understand.
- *Understanding News Literacy* — This document is created to have students read news literacy standards and to create clear and concise questions to use when they read news or experience videos and other media.
- *Modified Understanding: News Literacy With Questions* — This document has modified language in the synopsis of each standard to better address students with lower reading levels and those who might have difficulty deciphering text. The question column is already filled in with tested questions that address those standards to help students use the principles.

Choose the most appropriate worksheet for your student population from the files listed above. Read each of the news literacy principles and pause for discussion after each principle to engage the students in a class discussion. Prompt the students on what clear and concise questions the student can ask in order to address that principle when they are introduced to the news.

If students are having difficulty coming up with clear and concise questions, it is recommended you give the students some of the example questions created from the Work Sample Food Literacy handout. If time runs out, students can complete this assignment for homework. The teacher should collect the questions created by students and could also incorporate them later in the lesson.

At the end of the day, hand out the "What's in My Food?" worksheet. Students will complete this for homework and bring it the next class period, along with food items from home as described in the preparation section.

Day 2: What's in this food, and does it have a common ingredient?
Today, students will explore food labels and begin their evidence collection and reflection.

Have students (or the teacher) put whatever food was brought on a table in the classroom. Include foods that contain corn syrup, high fructose corn syrup, an ear of corn, beef, chicken, turkey, and milk, if possible. Additional food can be added along with boxes marked *organic*, *all-natural*, *farm-raised*, etc.

Have students present their foods and their findings from the homework sheet. After the discussion questions have been answered and discussed by your students, reintroduce the news literacy worksheet from Day 1 and briefly review the terms *fact, opinion,* and *bias*.

Ask: *How might these terms apply to what we know about food? Are we sometimes misled by what companies tell us about food products? It is always possible to know what is in our food? What sources of information might be most knowledgeable or reliable?*

The teacher will pick up an ear of corn and state: "Would you believe there are many other items on the table which have ingredients made from this ear of corn? Can you identify which foods have corn in them?" Students may not know that corn is used as feed for cows and chickens or that corn-derived ingredients don't necessarily have the word "corn" in their names.

Hand out the Evidence Collection and Reflection worksheet. Students will use this later today as they watch and read about food production. Students will use the worksheet each time they are introduced to new information.

Food in the Media

The students will be watching a video about where their food comes from and the primary use of corn. Students will watch the introduction to the movie "Fast Food Nation": Excerpt – clip from "Food, Inc." Source: http://www.takepart.com/foodinc (must buy video, but is on Netflix for personal viewing).

Play the beginning to 17:03. Stop briefly after the beef commentary (before eight minutes) to address the question from the "What's in My Food?" worksheet: Is corn related to beef?

If time allows, continue to watch the excerpt regarding chicken production. This can be omitted but can lead to a great discussion on how our meats are mass-produced and how animals feed mostly on corn.

After the clip, ask students to go back to their News Literacy Questions worksheet to consider what they might ask when evaluating different news reports on food. Ask: *How can we adapt some of these questions to learn more about where our food comes from? What might be important questions to ask about the media, which often advertise or tell us about our food?*

Explain to students that this film is a documentary. Ask: *What is a documentary? What is the purpose of a documentary? Are documentaries the same as news?*

Respond to answers and explain that while documentaries are supposed to present fact, they are often created to promote one type of view, or one specific agenda. So, they are not always as unbiased as a news report.

Ask: *Would you consider this film to be news, and does it adhere to a good example of a news report?*

Explain that students should not just accept what they read or watch as fact, but rather they should consider all media to be pieces of information that each need further research and understanding. Explain that now that students have seen one perspective, they are going to learn more about their food to better judge whether the information in this medium was truthful.

Day 3: What other things come from corn?
Begin your discussion this day with revisiting the table of food. Ask the students to come up and identify what other items have ingredients that come from corn. Ask the students to look at the label. Before leading into the video, take a poll of an item from the table (toothpaste is a good one) and ask, "Is there corn in toothpaste?"

Pair students up, and have them conduct some brief Internet research to discover if there is corn in toothpaste, and what other products contain corn that might be surprising to them.

Then, gather back around the table and take a poll of the students. Ask each one to point to a food they believe has corn in it. Now, have them take that food product back to a computer and research it specifically. On a piece of paper, they should answer the following questions:

1. What is your product?
2. Does it have corn in it? How do you know?
3. Write down all the ingredients, and highlight the ones that contain corn.

They may be able to do this based on the research they've already done, or they may need to use the Internet for more research.

This website can be helpful for this activity: www.livecornfree.com/list.

This research about corn-derived ingredients will help the students further question what they have heard from the video and further determine the accuracy of some of the claims.

Day 4: What is 'natural'?
Review the students' research from day three. Have students state some of the corn-derived ingredients they found in their food item. Explain that there are many food

products today that are derived from other food products and often bear the label "all natural" or "natural." Ask: *What do you think this means?*

Then ask: *Is your product all-natural, then? If corn is natural, are corn chips natural? If it comes from corn, which is natural, does that make the item natural?*

Give students the Is It Natural worksheet and have students fill in these definitions. Break students into teams to divide and conquer the definitions in this think/pair/share activity.

The first definition will be their own, the second definition needs to be from a dictionary, and the third definition should be from this FDA Web source: http://www.fda.gov/aboutfda/transparency/basics/ucm214868.htm.

Once the students are finished, ask: *What did you learn about the meaning of "natural" on the labels of food?*

Explain that from a food science perspective, it is difficult to define a food product that is "natural" because the food has probably been processed and is no longer the product of the earth. That said, the FDA has not developed a definition for use of the term *natural* or its derivatives. However, the agency has not objected to the use of the term if the food does not contain added color, artificial flavors, or synthetic substances.

Point out the "All Natural" picture found on the worksheet and note how 7 Up is labeled. Ask: *What definition of "natural" do you think 7 Up is using in its statement on the label?*

Ask the students to look back at the table of food. Ask: *Is the food you brought in "natural"?*

Food Labels in the News

Explain to students that 66% of consumers don't know what *natural* means when it's on the label. As a class, read this USA Today article: http://www.usatoday.com/story/money/2014/06/17/natural-food-labels-no-meaning/10674755/

When reading the article, have students refer to the Evidence Collection and Reflection worksheet.

Time-permitting, another great video regarding the words *natural* and *organic* comes from this site on YouTube: https://www.youtube.com/watch?v=pvG1PMQAfUA

Day 5: Reflective Essays

Pass out the Reflective Essay Rubric, and show students one last clip from Food, Inc.: https://https://www.youtube.com/watch?v=YHBPpv01n-M

Have a discussion regarding what they have learned from this video and all other materials given. Have students refer back to all worksheets, evidence collection worksheets, and the questions regarding news literacy.

Assessment

Now that students have collected all of their work and evidence, have the students use all the documents and worksheets, along with the rubric, to write a reflective culminating essay. In preparation, they should review the Reflection Prompt and Rubric.

Materials: Really?! I'm eating what?!

1. What's in My Food?
2. News Literacy Principles
3. Understand News Literacy
4. Modified: News Literacy and Questions to Ask when Reading the News (low lexile worksheet)
5. Evidence Collection and Reflection worksheet
6. Is It Natural?
7. Reflection Prompt and Rubric
8. Extension Ideas

What's in my food?

Name _____

Directions: Go home and find a food you can bring to class.
List the food here:_____.

Answer the following questions before our next class. Bring in the food for extra credit.

Discussion Questions:

- Where does this food come from?
- Do you care what's in it?
- Is there corn in it?
- Healthy/Not Healthy – Why?
- Have you read the nutritional facts on the foods?
- What do these terms *organic*, *processed*, and *ultra-pasteurized* mean?
- Name an ingredient and try to figure out where it comes from.
- What if there was something in there that could kill you in a few days?
- What if there was something in there that could kill you over the course of your lifetime?
- Is corn related to beef?

Reflecting on media use:

- Where do you get your news? (TV, Internet, newspapers, radio, social media?)
- How do you know it's accurate?
- How do you give your news to the world?

Discussion regarding the table of food: What do all of these foods have in common?

NEWS LITERACY PRINCIPLES

Name _____

These six principles are to guide producers and consumers of news and information. Underline key ideas/phrases that you need to consider while learning about the news and information. Discussion regarding this document will be held tomorrow.

1. Free expression is the foundation – the cornerstone – of democracy.

- The First Amendment is based upon the conviction that all human beings have inalienable rights. The foundation of journalism is the professionals' understanding of their obligation to accurately, thoroughly and completely inform their communities so people may become more effective and active citizens. This notion of civic responsibility will empower communities to make enlightened decisions, to express their disagreements, and to seek common ground.
- When ideas are allowed to flourish, it is the public's responsibility to determine what ideas and concepts to accept and which to embrace, to question, or to reject. The First Amendment is based on the premise that people who can freely share information (especially about their government) will be informed and able to make sound choices about what leaders to elect, to take responsibility for the welfare of their communities, and to respect the rights of people with different viewpoints and beliefs.

2. Discerning fact from opinion is a basic skill – and obligation.

- Journalists must clearly separate and label fact from opinion in their reporting of information to communities, and they should make concerted efforts to ensure that citizens know how to tell the difference. This includes news and news analysis, the news organizations' and individuals' opinions (columns, commentary, editorials, letters to the editor), advertising, advocacy ads, and advocacy reporting.
- The public must make it a priority to learn the difference between fact and opinion and make it a skill to help others in their communities know the difference. Individuals must wield the right to challenge what communicators claim is fact and what is opinion. People must demand transparency and credibility of information. Readers and viewers must look at information beyond their circle of comfort so they obtain complete and thorough data before acting. These obligations include evaluating what they receive and verifying what they develop on their own.

3. When the process of gathering and reporting is transparent, news and information are more meaningful, trusted, and credible.

- Journalists must present information free of bias and agendas. They should clearly identify issues or limitations on that information, including reporting that the information might be incomplete or from questionable sources. Journalistic independence is essential to this process.
- Readers and viewers must understand a source's agendas, motivations and backgrounds so they can make full use of that information, assessing what is true. They need to insist on independent journalists, professionals free of outside obligation and limitation, so they can trust the information they receive. They need to hold media accountable for the quality of information delivered. If members of the public are

news sources, they must identify their biases and be transparent in their actions.

4. Effective communication of news and information requires synthesis of multiple sources into meaningful context and comprehension of its impact.

- Journalists must make sense of information, using the most credible and reliable resources, so audiences can make meaningful use of it, in context, with a minimum need for clarification. In short, journalists must get it *right*. And it must be presented in a relevant, engaging manner without sensationalism, speculation, and bias.
- Citizens must take responsibility to make every effort to understand information received, including asking questions and pursuing their own versions of it. They must demand credible and reliable information sources, not infotainment based on information that is not *right*. And they must be taught the importance of seeking information of consequence.

5. Information requires verification to be effective.

- Journalists must find the best resources and substantiate what they say. They should present information in coherent ways as well as keep it clear, meaningful and relevant. The purpose of news is not diversion but the sharing of usable and reliable information in an engaging and relevant way. Journalists must question sources without advocacy or disengagement. Journalists' roles can be called "engaged independence."
- Individuals must expect that the information they receive is accurate, thorough, and reliably sourced and that the media delivering this information are responsible and credible. Communities must not accept information without critical thought and analysis, including comparison and evaluation. In evaluating such information, they should be involved, skeptical, and challenging in what they act on.

6. Information in today's society must empower forums to give voice to citizens and to monitor the free flow of information.

- Journalists must reflect their communities, but, when the need arises, they must first be able to challenge a community's values and preconceptions to maintain the free and accurate flow of information. Journalists must report information from all stakeholders, especially from those who might not otherwise have a chance to be heard, by creating a forum that adheres to journalistic principles. Journalists are the "watchdog" for society. They can bring about change by being journalistically responsible as well as by offering voice to those traditionally unheard.
- Individuals should expect to have a forum to air their views. That forum must also involve the responsibility to listen to the views of others. Individuals can join journalists in the "watchdog" function not only of society but also of the media, and can also provide the important function of giving voice to those traditionally underserved.

Source: *the Radio Television News Directors Foundation through a grant from The McCormick Foundation. Special thanks to Carol Knopes, Developed by Candace Perkins Bowen, John Bowen, Wally Dean and Carol Lange.*

Understanding News Literacy

Name _____

Principle of News Literacy	Synopsis	What is a Good Question to Ask?
1.Free expression is the foundation – the cornerstone – of democracy	The First Amendment is based upon the conviction that all human beings have inalienable rights. The foundation of journalism is the professionals' understanding of their obligation to accurately, thoroughly and completely inform their communities so people may become more effective and active citizens. This notion of civic responsibility will empower communities to make enlightened decisions, to express their disagreements, and to seek common ground. When ideas are allowed to flourish, it is the public's responsibility to determine what ideas and concepts to accept and which to embrace, to question or to reject. The First Amendment is based on the premise that people who can freely share information (especially about their government) will be informed and able to make sound choices about what leaders to elect, to take responsibility for the welfare of their communities, and to respect the rights of people with different viewpoints and beliefs.	
2.Discerning fact from opinion is a basic skill – and obligation.	Journalists must clearly separate and label fact from opinion in their reporting of information to communities, and they should make concerted efforts to ensure that citizens know how to tell the difference. This includes news and news analysis, the news organizations' and individuals' opinions (columns, commentary, editorials, letters to the editor), advertising, advocacy ads, and advocacy reporting. The public must make it a priority to learn the difference between fact and opinion and make it a skill to help others in their communities know the difference. Individuals must wield the right to challenge what communicators claim is fact and what is opinion. People must demand transparency and credibility of information. Readers and viewers must look at information beyond their circle of comfort so they obtain complete and thorough data before acting.	
3. When the process of gathering and reporting is transparent, news and information are more meaningful, trusted, and credible.	Journalists must present information free of bias and agendas. They should clearly identify issues or limitations on that information, including reporting that the information might be incomplete or from questionable sources. Journalistic independence is essential to this process. Readers and viewers must understand a source's agendas, motivations and backgrounds so they can make full use of that information, assessing what is true. They need to insist on independent journalists, professionals free of outside obligation and limitation, so they can trust the information they receive. They need to	

	hold media accountable for the quality of information delivered. If members of the public are news sources, they must identify their biases and be transparent in their actions.	
4. Effective communication of news and information requires synthesis of multiple sources into meaningful context and comprehension of its impact.	Journalists must make sense of information, using the most credible and reliable resources, so audiences can make meaningful use of it, in context, with a minimum need for clarification. In short, journalists must get it *right*. And it must be presented in a relevant, engaging manner without sensationalism, speculation, and bias. Citizens must take responsibility to make every effort to understand information received, including asking questions and pursuing their own versions of it. They must demand credible and reliable information sources, not infotainment based on information that is not *right*. And they must be taught the importance of seeking information of consequence.	
5. Information requires verification to be effective.	Journalists must find the best resources and substantiate what they say. They should present information in coherent ways as well as keep it clear, meaningful and relevant. The purpose of news is not diversion but the sharing of usable and reliable information in an engaging and relevant way. Journalists must question sources without advocacy or disengagement. Journalists' roles can be called "engaged independence." Individuals must expect that the information they receive is accurate, thorough and reliably sourced and that the media delivering this information are responsible and credible. Communities must not accept information without critical thought and analysis, including comparison and evaluation.	
6. Information in today's society must empower forums to give voice to citizens and to monitor the free flow of information.	Journalists must reflect their communities, but, when the need arises, they must first be able to challenge a community's values and preconceptions to maintain the free and accurate flow of information. Journalists must report information from all stakeholders, especially from those who might not otherwise have a chance to be heard, by creating a forum that adheres to journalistic principles. Journalists are the "watchdog" for society. They can bring about change by being journalistically responsible as well as by offering voice to those traditionally unheard. Individuals should expect to have a forum to air their views. That forum must also involve the responsibility to listen to the views of others. Individuals can join journalists in the "watchdog" function not only of society but also of the media, and can also provide the important function of giving voice to those traditionally underserved.	
Summary of Being a Critical Thinker about News Media		

Modified: News Literacy and Questions to Ask when Reading the News

Name _____

New Literacy Principle	Synopsis	How to Question the News
1. Free expression is the foundation – the cornerstone – of democracy.	Journalism has an obligation to be accurate, thorough and complete in their reporting in order to inform their communities in so that people may make educated decisions, but to also express their disagreements and to seek better understanding. It is the public's responsibility to determine what ideas and concepts to accept and which to embrace, to question or to reject. People can freely share information (1st Amendment) but should be informed about what they are sharing and be able to respect the rights of people with different viewpoints and beliefs.	**Just because I read it, does it mean it's true?** **Just because I heard this information a lot of times, does that mean it's credible?** **Just because I don't agree with the information, should I dismiss the information?**
2. Discerning fact from opinion is a basic skill – and obligation.	Journalists must clearly separate and label fact from opinion in their reporting of information. The public must make it a priority to learn the difference between fact and opinion and make it a skill to help others in their communities know the difference. Individuals must use the right to challenge what communicators claim is fact and what is opinion. People must demand transparency and credibility of information. Readers and viewers must look at information beyond their circle of comfort so they obtain complete and thorough data before acting. These obligations include evaluating what they receive and verifying what they develop on their own.	**Is this the author's opinion, or is it fact?**
3. When the process of gathering and reporting is transparent, news and information are more meaningful, trusted, and credible.	Journalists must present information free of bias and agendas and clearly identify issues or limitations on that information, even if it might be incomplete or from questionable sources. Readers and viewers must understand a source's agendas, motivations and backgrounds so they can make full use of that information, assessing what is true. They need to insist on independent journalists, professionals free of outside obligation and limitation, so they can trust the information they receive. They need to hold media accountable for the quality of information delivered. If members of the public are news sources, they must identify their biases and be transparent in their actions.	**Is there a bias in the way the information is represented?** **Is the information complete and from accurate sources?**
4. Effective communication of news and information requires synthesis of	Journalists must make sense of information, using the most credible and reliable resources. This way the audience can make good use of it. Journalists must get it *right* and it must be presented in a relevant manner without sensationalism, speculation, and bias.	**How many sources can I find that support this claim?**

multiple sources into meaningful context and comprehension of its impact.	Readers must take responsibility to understand information received, including asking questions and pursuing their own versions of it and understand what could happen if incorrect information continues to be perpetuated.	
5. Information requires verification to be effective.	Journalists must find the best resources and substantiate what they say. The information should be clear, meaningful and relevant. The purpose of news is not diversion but the sharing of usable and reliable information in a meaningful way. Individuals must expect that the information they receive is accurate, thorough, and reliably sourced. Communities must not accept information without critical thought and analysis, including comparison and evaluation. In evaluating such information, they should be involved, skeptical, and challenging.	**Is the source reliable?** **Do I need to research the author and/or the information further?** **Does the information make sense?**
6. Information in today's society must empower forums to give voice to citizens and to monitor the free flow of information.	Journalists must report information from all stakeholders, especially from those who might not otherwise have a chance to be heard, by creating a forum that adheres to journalistic principles. Journalists are the "watchdog" for society. They can bring about change by being responsible for what they report as well as by offering voice to those traditionally unheard. Individuals should expect to have a forum to air their views. That forum must also involve the responsibility to listen to the views of others. Individuals can join journalists in the "watchdog" function not only of society but also of the media, and can also provide the important function of giving voice to those traditionally underserved.	**How can I communicate this information to my peers and/or my community?** **How can I get someone to listen to me about what I think people should know about?**

Source: Edited from the Radio Television News Directors Foundation through a grant from The McCormick Foundation. Special thanks to Carol Knopes, Developed by Candace Perkins Bowen, John Bowen, Wally Dean and Carol Lange.

Evidence Collection and Reflection
Asking Critical Questions to Find Truth in Media

Name _____

Title of News Viewed/Read:_____Date:_____

Key Question	Answer	Notes/Evidence:
1. Who said it?		
2. Can I trust the source?		
3. Is that person biased on this subject?		
4. Am I biased on this subject?		
5. Where can I get information to help me frame my opinion?		
6. Can I substantiate this? Aka PROVE IT!		
Additional Questions: Use questions created from the Day 1 activity.		

Reactions/Notes/REALLY! Moments/What is it that I am going to do with this information?:

Is it natural?

Use diagram: http://www.bevreview.com/2010/05/27/coming-soon-7up-with-new-crisper-formula/image_7up_naturalchanges1/

Name _____

Student's Definition of Natural:

Webster's Definition of Natural:

FDA Definition of Natural: (Source: _____)

What is natural?

Use diagram: http://www.bevreview.com/2010/05/27/coming-soon-7up-with-new-crisper-formula/image_7up_naturalchanges1/

Name_____Teacher's Edition_____

Student's Definition of Natural: Not processed, grown in nature

Webster's Definition of Natural: Existing in nature and not made or caused by people coming from nature; not having any extra substances or chemicals added; not containing anything artificial; usual or expected

FDA Definition of Natural: (Source: www.fda.gov) – From a food science perspective, it is difficult to define a food product that is "natural" because the food has probably been processed and is no longer the product of the earth. That said, FDA has not developed a definition for use of the term *natural* or its derivatives. However, the agency has not objected to the use of the term if the food does not contain added color, artificial flavors, or synthetic substances.

Reflection Prompt and Rubric

Prompt: Write a one- to two-page reflection essay that explains what you learned, how this knowledge has impacted the way you think about media and food, and how you intend to use this knowledge in the future.

Skill	5	4	3	2	1
Depth of Reflection	Demonstrates a conscious and thorough understanding of the writing prompt and the subject matter. This reflection can be used as an example for other students.	Demonstrates a thoughtful understanding of the writing prompt and the subject matter.	Demonstrates a basic understanding of the writing prompt and the subject matter.	Demonstrates a limited understanding of the writing prompt and subject matter. This reflection needs revision.	Demonstrates little or no understanding of the writing prompt and subject matter. This reflection needs Revision. No Reflection Noted.
Use of Evidence from Media	Uses specific and convincing examples from the texts or media studied to support claims in your own writing, making insightful and applicable connections between texts. Uses all sources in writing.	Uses relevant examples from the texts or media studied to support claims in your own writing, making applicable connections between texts. Uses at least 4 major media in writing.	Uses examples from the texts or medias to support most claims in your writing with some connections made between texts. Uses at least 3 major media in writing.	Uses incomplete or vaguely developed examples to only partially support claims with no connections made between texts or medias. Uses 2 or fewer major media in writing.	No examples from the text or media are used, and claims made in your own writing are unsupported and irrelevant to the topic at hand. No evidence noted.
Language Use	Uses stylistically language that is precise and engaging, with notable sense of voice, awareness of audience and purpose, and varied sentence structure.	Uses language that is fluent and original, with evident a sense of voice, awareness of audience and purpose, and the ability to vary sentence structure.	Uses basic but appropriate language, with a basic sense of voice, some awareness of audience and purpose, and some attempt to vary sentence structure.	Uses language that is vague or imprecise for the audience or purpose, with little sense of voice and a limited awareness of how to vary sentence structure.	Uses language that is unsuitable for the audience and purpose, with little or no awareness of sentence structure.
Accuracy of Conventions and Spelling	Demonstrates control of the conventions with essentially no errors, even with sophisticated language. No spelling errors.	Demonstrates control of the conventions, exhibiting occasional errors only when using sophisticated language. 1 spelling error.	Demonstrates partial control of the conventions, exhibiting occasional errors that do not hinder comprehension. 2 spelling errors.	Demonstrates limited control of the conventions, exhibiting frequent errors that make comprehension difficult. 3 spelling errors.	Demonstrates little or no control of the conventions, making comprehension almost impossible. 4+ spelling errors.

Extension Ideas

1. Is HFCS natural?

Discuss the many differing views on high-fructose corn syrup; what do you know about it, where have you heard it, is it fact or opinion, and how can you know for sure?

Show: http://corn.org/products/sweeteners/. Click video "In Defense of High Fructose Corn Syrup" – http://bcove.me/g2sftf1k.

The teacher should ask: Do you find bias in this report? Refer back to Day 2 lesson notes regarding what is meant by bias and how news literate people question bias to determine fact or opinion.

The teacher will ask: Who is the Corn Refiners Association? Go to corn.org and have students listen to the teacher read the products scroll. You would think you can click, but you cannot.

Go to the sweeteners link at the bottom of the webpage found at http://www.corn.org/products/sweeteners/, and read the position paper on how sweeteners are natural at http://corn.org/wp-content/uploads/2009/12/CornSweetenerNatural.pdf or http://corn.org/press/position-statements/

Note the date of the upload. The teacher should engage the students in a discussion regarding bias, accuracy of information, and how they would question this piece of information using the news literacy questions they created.

The teacher will show what the FDA did in response to changing HFCS to corn sugar: Response to Petition from Corn Refiners Association to Authorize "Corn Sugar" as an Alternate Common or Usual Name for High Fructose Corn Syrup (HFCS). Source: http://www.fda.gov/aboutfda/centersoffices/officeoffoods/cfsan/cfsanfoiaelectronicreadingroom/ucm305226.htm

The teacher will now introduce scientific articles and report that most journals are peer-reviewed by professionals to ensure that accurate information makes its way to the public. But does this article show bias? Source: http://ajcn.nutrition.org/content/88/6/1716S.full. The teacher will show acknowledgements: See Consultant – for Food Industry. Explain that even the most scientific of papers in journals that are peer-reviewed and respectable may be biased. Review bias as needed.

HW: Have the students go to http://recipes.howstuffworks.com/high-fructose-corn-syrup.htm and create questions for a Worksheet or have students create fact sheets

regarding HFCS. Show author authentication. Have students go home and research what they find about HFCS and have them share in class or on an online forum such as Edmodo. Reintroduce the third principle of news literacy, "Citizens must take responsibility to make every effort to understand information received, including asking questions and pursuing their own versions of it."

2. What is organic? (Chapter 10 and parts of 6 from Michael Pollan's Book)

Use the template similar to that of the "Is it natural?" worksheet, except make it into an exercise for "What is organic?" Have the students search the three definitions as they did for the term *natural*. The teacher will show examples of USDA Organic and different labels on foods. Refer to visual from book regarding the different types of organic.

3. What is GMO?

Introduce Radio Media. Cue up NPR's "A Growing Debate: How To Define 'Organic' Food" at
http://www.npr.org/2011/03/01/134162035/a-growing-debate-how-to-define-organic-food.
The transcript is available for those who may have hearing impairments or for students who would like to read along. For further information or to include prior to this lesson, incorporate a lesson on GMO. "Harvest of Fear," by PBS, presents a great interactive format and lessons to go further into this discussion.
http://www.pbs.org/wgbh/harvest/

GMO labeling – do you want it? Colorado does:
http://www.sfgate.com/search/?action=search&firstRequest=1&searchindex=gsa&query=Genetically+modified+food+labels+to+be+on+ballot

4. What is the truth behind food labels?

Each student can take one of the labels from the "Six Meaningless Claims on Food Labels" for Research:
http://well.blogs.nytimes.com/2010/01/28/six-meaningless-claims-on-food-labels/?_php=true&_type=blogs&_r=0

Instruct students to go back to the table of food and practice the fifth principle of news literacy: "Communities must not accept information without critical thought and analysis, including comparison and evaluation. In evaluating such information, they should be involved, skeptical, and challenging, in what they act on."

News Literacy Model Curriculum in Science Grades 7/8

Lesson 2: Exploring Silica-sand Mining

Lesson 2

Exploring Silica-sand Mining

In the last few years, silica sand mining has exploded in southeastern Minnesota. This activity was designed to help students develop their own opinion about this controversial issue and then express it in a paragraph. Students will be exposed to authoritative sources on the issue and will also learn to question credibility on important matters.

Grade Level: 7-8, but can be adapted for any grade
Estimated Time: Two days

Learning Objectives
Students will:

- Brainstorm various resources and discuss the validity of each one.
- Discuss bias and work on identifying it.
- Collect research on the topic and categorize ideas as fact or opinion.
- Create a pro and con list for the topic.
- Form an opinion and support it with facts.
- Write a paragraph stating their position.

Guiding News Literacy Question: How can students know what to believe?
Many students likely have very little knowledge of the politics behind silica-sand mining. By first learning about the types of bias, students will be prepare to conduct their own online research to explore sand mining without preconceived notions. In doing so, they'll gather evidence to form their own opinions on the topic while evaluating sources for issues of bias and credibility.

Common Core State Standards

CCSS.ELA---LITERACY.RI.6.8	Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not
CCSS.ELA---LITERACY.RI.8.6	Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints
CCSS.ELA---LITERACY.RI.8.7	Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular

	topic or idea.
CCSS.ELA---LITERACY.RI.8.8	Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.
CCSS.ELA---LITERACY.W.8.1.B	Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
CCSS.ELA---LITERACY.W.8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Next Generation Science Standards

Matter and Its Interactions	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
Earth and Human Activity	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
Earth and Human Activity	Construct an argument supported by evidence for how increases in human population and per---capita consumption of natural resources impact Earth's systems.

Materials

Computer or iPad, one per student
List of resources
Research project handout

Preparation

Create a list of sources on the topic for the students to use.
Handouts (if desired, or modify for a different, more relevant topic to your location)

Teacher Resources:

Some extensions to help writing persuasive essays:
http://www.readwritethink.org/classroom-resources/lesson-plans/convince-developing-persuasive-writing-56.html

A mini lesson on bias in the media with a science correlation:
http://www.studentnewsdaily.com/example-of-media-bias/noaa-scientist-disagrees-with-networks-claim-of-historic-california-drought/

A list of numerous articles on media bias:
http://www.studentnewsdaily.com/example-of-media-bias/noaa-scientist-disagrees-with-networks-claim-of-historic-california-drought/

A mini lesson comparing and contrasting credibility of sources using climate change:
http://www.readwritethink.org/files/resources/lesson_images/lesson1139/evaluating_scientific.pdf

A complete set of lessons on credibility including a scavenger hunt for a website:
https://docs.google.com/document/d/1wpDm3zSQn8xgfsM4k53MKXopO9YshbFp7og9LZmDN6Y/edit

Worksheet on finding bias:
http://go.hrw.com/resources/go_sc/hst/HSTSW201.PDF

Instructional Plan

Introducing the project

This lesson is a student-driven research project, so you'll want to pass out the project worksheet included in the materials section. Explain to students that they will be doing a deep investigation into a controversial topic.

Note: For this lesson, the teacher purposefully refrains from giving a detailed introduction into the topic of silica-sand mining. By allowing students to research without preconceived notions of the topic, they are more likely to follow their own natural research patterns because they aren't subconsciously looking for certain types of information or certain perspectives.

Explain to students that first, they'll research the topic using the Internet. Then, as a class, you'll discuss their findings and the process of sorting fact from fiction online.

Before they begin, discuss these guiding questions: What qualities should a valid website have? Discuss the qualities of a reliable resource. For example, does it show the author, date, last update, etc.

Ask: What is bias? Why would a source contain bias? The teacher might want to explain these different types of bias:

1. Bias by omission: leaving out facts that you don't "like" or you don't "think are true"; or, leaving out an important perspective.

2. *Bias by selection of sources:* including sources that only support one view. Including sources that are trying to further their own agenda.

3. Bias by story selection: choosing stories that further a cause, or ignoring stories that you don't like or that might cause trouble for friends.

4. *Bias by word choice:* using loaded words or labels that convey certain meanings instead of more neutral terms ("freedom fighter v. terrorist").

Hand out the project sheet and go through the directions with students.

Independent student research

Give students ample time to conduct their research and complete the project. This will likely take 1-2 full class days.

Assessment

Based on their opinions and reasons for them, the students will write on paragraph defending their ideas. They should write as if they are presenting their arguments to the fictional county board.

Student Resources for Research

Potential Research Articles
Encourage students to find articles on their own, but provide this list for those students who have trouble self-starting.

http://silicasand.mn.gov/

http://www.ibtimes.com/us-oil-gas-fracking-boom-could-drive-silica-sand-mining-operations-12-more-states-1695246

http://en.wikipedia.org/wiki/Sand_mining

http://conservationvoters.org/issues/frac-sand-mining/

http://www.armofmn.com/mining/minnesota-industrial-sand-council

Additional resources:

Minnesota PCA
http://www.pca.state.mn.us/index.php/air/air-quality-and-pollutants/air-pollutants/silica-sand-mining/index.html

MPR List of Articles
http://minnesota.publicradio.org/collections/frac_sand/

DNR FAQ
http://www.dnr.state.mn.us/silicasand/index.html

5 Things to Understand About Silica Sand Mining
http://live.mprnews.org/Event/QA_Understanding_frac_sand_with_Minns_Chief_Geologist

Presentation of Silica Sand Mining- A really good overview.
http://www.mgwa.org/meetings/2012_fall/gw_energy/runkel.pdf

Materials: Exploring Silica-sand Mining

1. Silica-sand Mining Research Project
2. Student Assessment Checklist
3. Extension Ideas

Silica-sand Mining Research Project

Name:_____

With the ever-increasing demand for fossil fuels, people are turning to hydraulic fracking to mine natural gas. One major part of the process is silica sand. In southeastern Minnesota there is a deposit of this sand, which has all of the characteristics the oil companies seek.

Guiding Question: Should the people of this area allow mining companies to come and remove the silica sand? It is now up to you to decide.

Directions: To gather the facts, you will read several news articles on the topic. Each article must be evaluated for credibility, and facts and opinions must be separated. First, answer the questions below, then conduct your research and fill out the table.

1. Why do you need to read more than one article to gather data for you opinion?

2. How can the following help to determine if an online article is credible?

   Author:

   Date:

   Last Update:

   How does it relate to my topic?

   Who sponsors the site or publishes it?

   What is the purpose of the site?

3. What is bias? How do you identify it?

For each article you read, use the qualities above to determine if you should consider it a credible source and fill out the table below.

Source	Why it is credible	Evidence of bias

Based on the table, what qualities make a source credible?

For each credible source you find, fill out the table below to learn about silica-sand mining.

Title and author of the article	Source (name of paper, magazine or web address)	Facts	Opinions

Based on the information you gathered, fill in the table below.

Reasons to allow silica-sand mining	Reasons not to allow silica sand mining

What examples of bias did you find in your research?

What is your opinion for the county board? Should we allow silica sand mining or not?

What are three fact-based reasons for your opinion?

1.

2.

3.

Conclusion: Write a paragraph about your opinion and the reasons for it. In your writing, work to eliminate the use of pronouns (I, we, she, him, us).

Student Assessment Checklist

Advanced

- ❑ Correct spelling, grammar, and mechanics
- ❑ Clearly stated opinion
- ❑ Supporting sentences are easy to understand and give facts to support opinion
- ❑ Did not use I, me, us, or we
- ❑ Sources cited

Proficient

- ❑ Mostly correct grammar, spelling, and mechanics
- ❑ Clearly stated opinion
- ❑ Most supporting sentences give facts and evidence for opinion
- ❑ Did not use I, me, us, or we
- ❑ Sources cited

Progress toward proficient

- ❑ Mostly correct grammar, spelling, and mechanics
- ❑ Opinion stated
- ❑ Some supporting sentences give facts and evidence for opinion
- ❑ Some sources cited

Basic

- ❑ Mostly correct grammar, spelling, and mechanics
- ❑ Opinion stated
- ❑ Few supporting sentences give facts and evidence for opinion

Comments for student:

Extension Ideas

1. Complete a five-paragraph essay on the topic.
2. *Stage a debate.* Assign half the class to each side of the topic, and create a juried panel of student experts to decide.
3. Stage a hearing for the county board.

News Literacy Model Curriculum in Science Grades 8-12

Lesson 3: Geologic Time WebQuest

Lesson 3

Geologic Time WebQuest

Students will engage in a WebQuest to play the role of the paleontologists and determine the characteristics of fossils, the environment of formation, and the characteristics of life forms throughout the geologic history of New York State. Throughout this WebQuest, students are exposed the vast array of public information and research available on the Internet. This lesson emphasizes the value of public databases and publicly funded research databases.

Grade Level: 8-12
Estimated Time: This Web Quest was designed as a stand-alone differentiated unit for students to work independently. This unit was designed to take one week. Each section has an approximate time of completion to allow students to practice their time management skills.

Learning Objectives
Students will:

- Identify all the given fossils in the ESRT Geologic History Table, pp. 8 and 9.
- Describe a characteristic that makes good index fossils.
- Give the time period during which the fossil species was present on Earth.
- Analyze and describe the characteristics of life on Earth during that time.
- Compare and contrast these fossils to other fossils.
- Describe any important geologic event that happened during the time the fossil was still around.
- Navigate publicly funded online information sources.

Guiding News Literacy Question: What challenges do the Internet and digital media create?
Students who first begin to use the Internet for research are likely to feel overwhelmed. By exploring the vast network of publicly funded information and research with a specific goal in mind, they will become more familiar with the depth of data available and will learn how to navigate those "information neighborhoods." Students will understand the value of these public information sources and will be able to contextualize their role in comparison to other sources, like media and entertainment sites.

Common Core State Standards

RST.6-8, 9-10, 11-12.1	Cite specific textual evidence to support analysis of science and technical subjects.

RST.6-8, 9-10, 11-12.2	Determine the central ideas or conclusions of a text; provide an accurate summary of text distinct from prior knowledge or opinions.
CCSS.ELA---LITERACY.W.8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Next Generation Science Standards

Evidence of Common Ancestry and Diversity	Genetic information, like the fossil record, provides evidence of evolution. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence.
History of Planet Earth	Although active geologic processes, such as plate tectonics and erosion, have destroyed or altered most of the very early rock record on Earth, other objects in the solar system, such as lunar rocks, asteroids, and meteorites, have changed little over billions of years. Studying these objects can provide information about Earth's formation and early history.
Biogeology	The many dynamic and delicate feedbacks between the biosphere and other Earth systems causes a continual co-evolution of Earth's surface and the life that exists on it.

Materials

Link to WebQuest: http://questgarden.com/151/57/0/121116162035/
Evaluation rubric embedded in WebQuest
Geologic Time WebQuest Checklist
Class set: Complete WebQuest Study Guide and Worksheet
WebQuest Answer Key

Instructional Plan

Explaining the WebQuest

Pull up the WebQuest website on a projector and walk students through the different pages. Explain that they are going to independently pace themselves through this lesson that teaches them about the geologic history of New York state. In doing so, they will be exposed to the various forms of public archives, documents, and resources on the Internet. Links and questions are embedded into the website, so students are able to pace themselves for the entirety of the quest.

Have students pull up the link on their own computers, and give them a few minutes to explore each part. Then, go through the WebQuest checklist as a class to clarify expectations. Pass out copies of the study guide.

Understanding the value of public information sources

Before students begin the WebQuest, ask them to glance at the link and describe the sources of information they are going to explore. They should hit on points such as: They are related to New York State, they seem to be types of databases, they have scientific information, etc.

Now, ask: *Would you consider these websites to be news sites, entertainment sites, or public information sites? How do you know? Who runs or manages these sites? How can you tell?*

Respond to answers and redirect – they are not news sites because they are not run by private, independent publishers (e.g., The Los Angeles Times). They are not entertainment sites because they are clearly meant to inform, and they are run by state entities like universities. In a way, these sites are extensions of the public because they are likely funded in part by citizen tax dollars.

Ask: *Why are sites like these important? Why is it valuable to have government and publicly funded websites full of public information, including scientific data?*

Respond to answers. Explain to students that it is in the public's best interest – in order for us to be intelligent and informed – that some information remain "free" to the public. In other words, this information isn't owned by a private news company that could simply take it off the web for any reason. Its educational value supersedes any monetary gain, and these websites almost serve as online science schools for anyone interested in learning more about the topic. This empowers citizens to be curious, to expand their knowledge, and to seek out answers to questions about the world around them.

Self-paced WebQuest

Allow students time to self-pace through the WebQuest. They should fill out the Study Guide as they go along. This will likely take a week of class time to complete, including development of their PowerPoint presentations.

Class presentation of PowerPoint shows

When students are finished, they should present their PowerPoint presentations to the class.

Materials: Geologic Time WebQuest

1. Geologic Time WebQuest Checklist
2. Complete WebQuest Study Guide and Worksheet
3. WebQuest Answer Key

Name _____

Geologic Time WebQuest Checklist

____I read the Introduction.
____I read the Required Tasks page.

Part I

____I completed *Life Has a History* at University of California Museum of Paleontology.
____I watched the Part I video titled *ESRT Page 8-NYS Geologic History*.
____I watched the Part II video titled *ESRT Page 9-NYS Geologic History*.
____I read the three articles in the *Geologic History of New York State*.
____I completed *Getting Into the Fossil Record* at University of California Museum of Paleontology.
____I read all of the text on the Part I page.

Part II

____I downloaded the *Geologic Time Answer Sheet*.
____I viewed the PowerPoint titled *Geologic Time* on the Earth and Atmospheric Sciences Teacher Web Page.
____I watched the *TMBG* video.
____I read all of the text on the Part II page.

Part III

____I downloaded the *Fossil Index Guide to New York State* sheet.
____I viewed the PowerPoint titled *Fossil Index Guide to New York State* on the Earth and Atmospheric Sciences Teacher Web Page.
____I e-mailed my teacher the lab report for the *Fossil Index Guide to New York State*.
____I completed my final PowerPoint presentation and e-mailed it to my teacher.
____I remembered to include the following in my PowerPoint presentation:
- ____A personal definition of what the term *geologic history* means from *Life has a History*
- ____*Complete* a 3-2-1 slide for the New York State Museum readings, including three things you read that you already knew, two things that you learned upon reading the article, and one thing that you still have a question on.
- ____Describe the process of how fossils form.
- ____Discuss the three characteristics of an index fossil.
- ____Explain the unique geologic history of New York state.

Complete WebQuest Study Guide and Worksheet

Name _____

Answer the following questions while viewing the PowerPoint Geologic Time. Use complete sentences where applicable.

Where do we find fossils? _____

Why is this statement false: "The caveman had dinosaur for breakfast"?

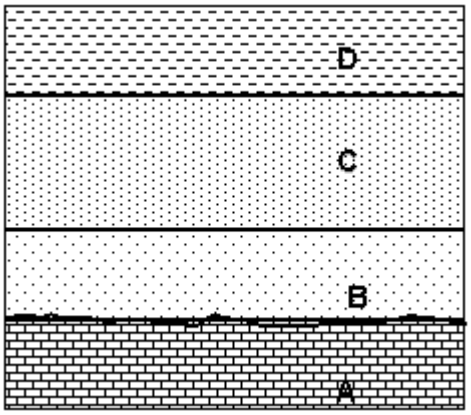
_____

_____

If a sedimentary rock outcrop has not been overturned, which layer would be the oldest? What is this principle known as?

_____

_____

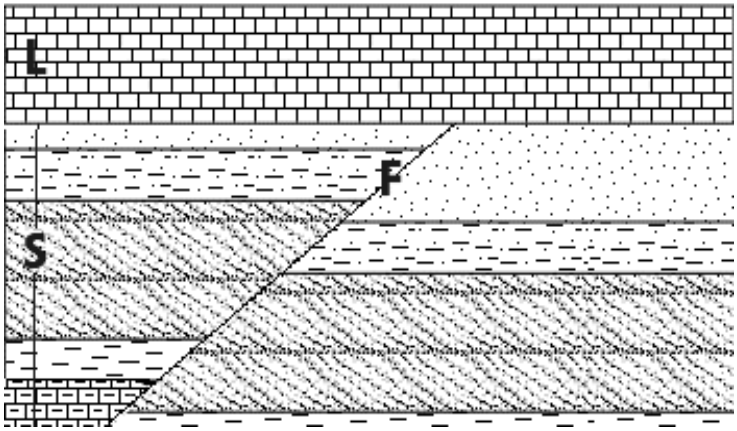


Using this principle, label the strata below from oldest to youngest.

Faults are always **older** or **younger** than the rocks they cut through. (Circle one)

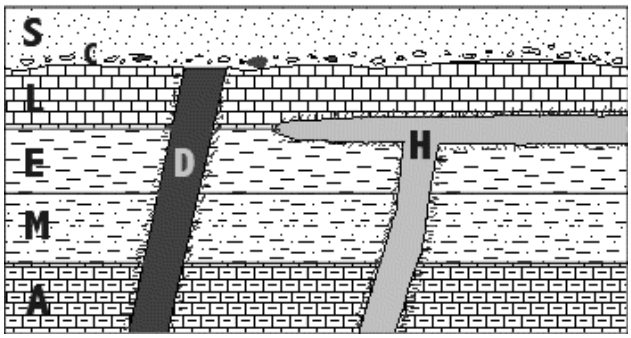
Which is older: **F** or **S** ?
(Circle one).
How do you know?

_____
_____
_____
_____
_____



If a geologist finds an igneous sill, how can she determine if the sill is an intrusion or an extrusion?

_____
_____



Is “H” an intrusion or extrusion? How can you tell?

_____
_____
_____
_____
_____

What is an unconformity?

_____
_____
_____

How does it complicate the relative dating of rock layers?

_____
_____
_____

What processes could lead to an unconformity?

_____
_____
_____

What characteristics must fossils have in order to be good index fossils?

In your own words, explain the theory of evolution.

Explain how the fossil record supports this theory.

Take a break now and answer the next set of questions in your study guide using pages 8 and 9 of your ESRT.

1	Approximately how many million years ago did the earliest amphibians appear?
2	Approximately how many million years ago was the initial opening of the Atlantic Ocean?
3	During which era did the earliest fish appear?
4	During which epoch did large carnivores appear?
5	Of the following rocks, which would be most likely to contain fossils? a. rhyolite b. basalt c. metaconglomerate d. limestone
6	At Binghamton, New York, what is age of the bedrock?
7	How does the age of the bedrock at Old Forge compare with that at Jamestown?
8	Name a location in NY State where you may be able to find bedrock which was formed at the peak of the eurypterid's development.
9	Why would fossils be unlikely to be found in quartzite?
10	For each of the following locations in New York below, identify whether fossils would be likely or unlikely: Old Forge, Binghamton, Albany.

Why are radioactive isotopes useful in determining the absolute age of a rock?

_____

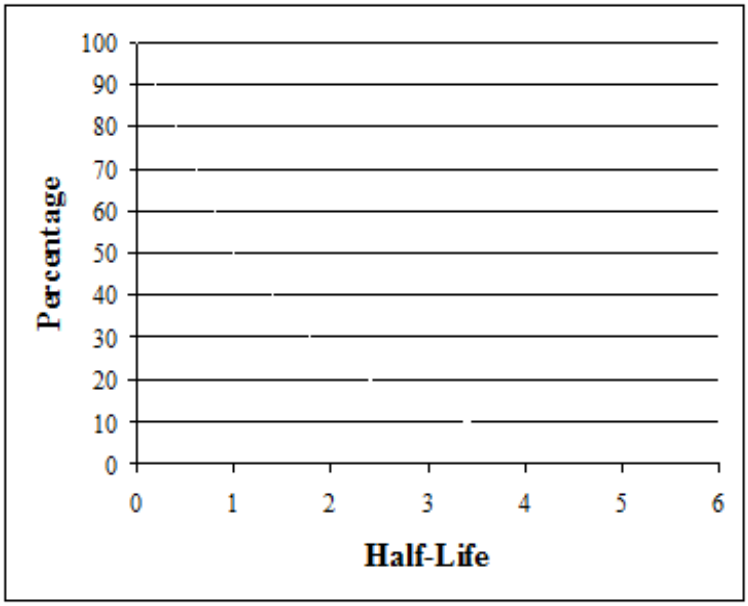
_____

What can be done to change the half-life of a radioactive isotope? Explain why this is important?

_____

_____

_____



Draw the generic graph for the half-life of a radioactive isotope.

What radioactive isotope could be used to determine the absolute age of material that was <u>recently living</u>?

_____

_____

_____

What is the half-life of uranium-238?

_____

_____

Name _____

Directions: Answer the following questions as you navigate through the Geologic Time WebQuest.

1. How is relative age different from the actual date of an event?

2. What can radiometric dating tell us about the age of rocks that the law of superposition cannot?

3. How can you find the age of a layer of rock that is surrounded by layers of volcanic ash?

4. What do the periods in the geologic time scale represent?

5. What do the terms *Paleozoic*, *Mesozoic*, and *Cenozoic* mean?

WebQuest Answer Key

Part I

Life Has a History at University of California Museum of Paleontology.
Answers embedded in activity. Student must correctly answer questions in order to advance to the next section of the activity.

Getting Into the Fossil Record at University of California Museum of Paleontology.
Answers embedded in activity. Student must correctly answer questions in order to advance to the next section of the activity.

Part II

Geologic Time Answer Sheet

1. Fossils are found in sedimentary rock.

2. Man and dinosaurs did not live at the same time.

3. The oldest layer is the layer on the bottom. The principle of superposition.

4. Layer A is the oldest. Layer D is the youngest.

5. Faults are younger than the rocks they cut through.

6. S is older. It is older because a layer of rock must be deposited before a fault can cut through the layers.

7. If a sill is an intrusion, there will be contact metamorphism on all sides. If it is an extrusion, there will be no contact metamorphism on top.

8. H is an intrusion. IT has contact metamorphism on top.

9. An unconformity is a buried erosional surface. It complicates the relative dating of rock layers because a part of the rock record is missing.

10. Weathering and erosion lead to an unconformity.

11. To be a good index fossil, an organism must have lived over a large geographic area, lived for a short period of time, and there must have been "a lot" of them.

12. Evolution can be described as an organism's ability to adapt to its environment in order to survive.

13. The fossil record supports this theory because we can see that organisms have changed over time.

14. Answers for "Page 3" are embedded in the PowerPoint. 1. 362-418 MYA
2. 142-206 MYA
3. Paleozoic
4. Pliocene
5. Limestone (sedimentary)
6. Devonian 362-418 MYA
7. Jamestown is younger
8. Silurian age bedrock: Niagara Falls, Syracuse

15. Metamorphic

16. Old Forge, unlikely. Bingham, likely. Albany, likely.

17. The half-lives of radioactive isotopes are constant.

18. Nothing can be done to change the half-life of a radioactive isotope.

19. Graph is embedded in PowerPoint.

20. Carbon-14 is the radioactive isotope used to date the age of recently living material.

21. The half-life of uranium-238 is 4.5 billion years.

Part III

Lab Report for the *Fossil Index Guide to New York State*

1. Relative age allows scientists to know whether something is older or younger than something else, while absolute age means that scientists know the exact number in years that have passed since the object was created.

2. Radiometric dating gives us the age of a rock, while the Law of Superposition determines the relative order of past events, without necessarily determining their absolute age.

3. You find the age of a layer of rock that is surrounded by layers of volcanic ash by dating each of the layers of the ash. The rock layer's age is somewhere

in between.

4. A geologic period is one of several subdivisions of geologic time enabling cross-referencing of rocks and geologic events from place to place.

5. Paleozoic means ancient life, Mesozoic means middle life, and Cenozoic means recent life.

News Literacy Model Curriculum in Science Grade 8

Lesson 4: Fact or Myth – Can Cell Phones Destroy Gas Stations?

Lesson 4

Fact or Myth – Can Cell Phones Destroy Gas Stations?

Students will unpack the myth "Can Cell Phones Destroy Gas Stations?" to determine its basis in science and fact. Throughout the lesson, students will analyze authors' purposes, compare and contrast articles, and use the topic of static electricity to follow procedures. Understanding the science behind the topic will help students determine what information regarding this myth is credible. Once the students have researched the reliability of the news articles, they will watch the "MythBusters" episode (Discovery Channel) to decide if the myth "Can Cell Phones Destroy Gas Stations?" was busted or not.

Grade Level: 8
Estimated Time: 10 class periods

Learning Objectives
Students will:

- Analyze a variety of articles to determine the author's purpose.
- Compare and contrast the information given.
- Assess the credibility of each article.
- Use the scientific concepts associated with the myth and follow a procedure using the topic of static electricity.

Guiding News Literacy Question: How can students know what to believe? *While today's students are quick to acknowledge that myths, exaggerations and outright lies are bound to circulate throughout society, they may not realize that science can help them to fact-check statements they find dubious. Young adults who add the scientific approach to their arsenal of fact-checking skills are well equipped to combat misinformation.*

Common Core State Standards

CCSS.ELA-Literacy.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CCSS.ELA-Literacy.RST.6-8.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
CCSS.ELA-Literacy.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Next Generation Science Standards

Types of Interactions	• Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects. (MS-PS2-3) • Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun. (MS-PS2-4) • Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively). (MS-PS2-5)
Science and Engineering Practices	Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles. (MS-PS2-3)
Connections to Nature of Science	Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS2-2), (MS-PS2-4)

Materials

Overhead
Projector (for video and to project cell phone images)
Netflix or DVD: "MythBusters" Collection I, Episode 3

- http://preview.discovery.com/tv-shows/mythbusters/videos/cell-phone-gas-station-minimyth/ (preview for free, 2:23, gives a good overview)
- Purchasing the DVD – $19.98 (Your librarian might purchase it for your school.)
- Netflix.com – $7.99 (You would have to have it in your que ahead of time.)
- Purchase through youtube.com – $1.99

Anticipation/Reaction Guide
Guided Note-taking and two-column Worksheet
Two-column notes handout
Matching Worksheet
Static Electricity Lab sheet and lab materials (per group)

- 2 inflated balloons with string attached
- Aluminum can
- Woolen fabric

Preparation
Make sure articles are suitable for your students.
Copies of materials

Websites and Resources
Author's purpose:
http://www.sophia.org/tutorials/referencing-the-authors-purpose

Cell phone pictures:
http://markdroberts.com/?p=371

https://www.flickr.com/photos/ericejohnson/4295485592/

http://skepticalreadycheck.wordpress.com/2010/11/01/ur-cellphone-asplode/

http://subjunctive.net/klog/2006/07/three_signs/

http://www.minot.af.mil/news/story.asp?id=123134874

http://www.cnet.com/news/exploding-cell-phone-kills-store-employee/

Articles:
http://www.firehouse.com/forums/t38761/ (blog)

http://www.nydailynews.com/autos/cell-phones-don-pump-fires-experts-article-1.1123228 - ixzz2mF19pZjh

http://abcnews.go.com/GMA/story?id=127836
http://urbanlegends.about.com/library/weekly/aa062399.htm

Static Electricity Lab:
http://www.sciencekids.co.nz/experiments/staticelectricity.html

Instructional Plan

Introductory Activity

Introduce the myth by asking students if they've ever heard that static electricity from cell phones can cause explosions at gas pumps. Ask:

- Have you heard of this myth before? Where? From whom?
- Have you seen any signs posted at gas stations about this danger?
- Do you think this could really happen? Why or why not?

Ask students to complete the Anticipation/Reaction Guide. They should complete the anticipation portion (agree or disagree) of the handout individually. Glance at the work to get an idea of what students know and what their misconceptions are. You do not want to give away answers at this time.

Understanding Author Purpose

Before reading the articles, take a moment to discuss with students how they can understand an author's purpose when reading different types of content.

Ask students to list different kinds of content, and then ask them to distinguish which of those are primarily informative (e.g., news articles, text books), entertaining (e.g., novels, magazines), and persuasive (e.g., commercials). Explain that they will read three different articles about this myth and consider the author's purpose while determining the credibility of the article. They will create a hypothesis, learn about how to read articles critically, and then assess the myth.

Creating a Hypothesis

Discuss with your students whether it is possible to "read" a picture or sign. Are signs up for interpretation? Do you know the resource that the information came from? Consider the idea that not all information is factual and that we need to start questioning what we see and read about. Use a projector to view images related to this myth as a class (links provided under materials) and create a hypothesis. You may need to review what a hypothesis is. (It is an educated guess usually written as an "if, then" statement.)

Reading for Truth and Using News Literacy to Assess Content

Pass out the news literacy standards, and have students read silently. Then, discuss what the standards mean: freely sharing information, the difference between facts and opinions, what biased and unbiased mean, how we can verify accurate details, and who is the target audience. Explain that the journalist's job is to inform with accurate, factual details, and in return, citizens need to question and delve further into the topic to determine the reliability of the information. This discussion determines the responsibilities of each party involved in news and its credibility.

Next, model for students how to read critically by coding text and using two-column note-taking. Use the Guided Note-taking and Two-column Worksheet in the

materials section to walk through this exercise. Ask students to read the comments from the online Web forum (found on the worksheet), then highlight or underline key ideas. Then, in their two columns, they should write the main ideas and their response, which might be an interpretation, related question, or connection. When finished, ask students what needs to be researched to answer the questions that the blog raised and to determine credibility of the blog.

Depending on how familiar students are with online forums, you might also take a moment to ask students whether individual commentators are always reliable or credible.

Ask: *Do you believe comments you read in online forums? Why or why not? Under what circumstances? What steps do you take to verify the information another person posts?* Explain that the reading exercise that follows will help enforce good fact-checking habits.

Student Coding and Assessment

Instruct students to find and read three articles and complete a coding and note-taking exercise individually. Group discussion should occur after each article is completed and before the students begin their next article. The order of articles is not important. Students can locate their own articles, or you can provide access to the ones listed under the websites and resources section.

Once the three articles have been read, notes have been taken, and the articles have been discussed, it is time to prepare for research.

Students should write down any information from their three notes pages that needs to be researched and verified. They might need to ask:

- Who is the author? What are his/her credentials?
- Can you contact the creator of the article?
- If an idea was presented as a fact, it needs to be confirmed.
- They might consider the accuracy of details. Can they find the same information from another reliable resource?
- Who are the resources behind the verified information – businesses, scientists, corporations – and why does that matter?
- Who are the "experts"?

Direct students to spend enough time researching to answer these questions and then to answer the final question: "Which article is most reliable/credible? Why?" Instruct students to back up their answer with evidence from the research. Explain that this method of questioning sources, conducting their own research, and establishing their own conclusions is much like using the scientific method to analyze information.

Part II (2.5 days)
As a class, brainstorm the following question: "What is static electricity, and what are your connections to it?"

Instruct students to write anything down that they associate with static electricity or any connections they have to it, and then ask for volunteers to share their ideas (e.g., getting shocked after rubbing socks on a carpet, trampolines, rubbing a balloon in their hair and having the hair stand up.) These will differ depending on prior knowledge.

Group Activity – Determining Prior Knowledge
In groups, pass out sets of the cut up matching slips (in the materials section). Instruct each group to work together to match the terms or phrases that go together.

Once the groups feel as though they have matched the ideas to the best of their knowledge, review the answers and clarify misconceptions about static.

Finally, discuss what static electricity really is and why we get shocked. Use the matching results to connect the ideas from the brainstorm to what is really happening in the scenarios they suggested. You might ask:

- Why do you get shocked on a trampoline or when you open a door after rubbing your socks on a carpet?
- Why does your hair stand straight up if you rub a balloon against it?
- What materials make shocks worse, and what materials do not shock you?
- What can you do to lessen the shock?
- How do charged particles play a role in static electricity?

Lab Experiment
Instruct students to complete the static lab experiment using the provided lab sheet (based off an activity found at http://www.sciencekids.co.nz/experiments/staticelectricity.html). Put the lab sheet and materials. Students should complete the procedure, data table, and conclusion questions.

There should be enough time for everyone in the group to try the procedures. Once students are finished, have a contest to see who can charge the objects the most (i.e., see whose hair stands up the most or who holds the most balloons with static).

Class Wrap-up
Finally, ask students to share whether they believe the myth that cell phone static causes gas station explosions is true or false based on their readings and

experiment. They must use evidence from the articles and the lab to defend their answers.

Watch "MythBusters" Collection I, Episode 3, and complete another set of two-column notes. Instruct students to fill in the first three bullets of the two-column notes before watching the video and then to fill in the remainder of the notes during the video.

Discuss the "busted" myth and how "MythBusters" tested it. What did they have to keep the same (constants)? What were the results?

Finally, have students go back to their Anticipation/Reaction Guide and complete the "Reaction" portion.

Materials: Fact or Myth?

1. Anticipation/Reaction Guide
2. Guided Note-taking and Two-column Worksheet
3. Two-column notes handout
4. Matching Worksheet
5. Static Electricity Lab Sheet

Anticipation/Reaction Guide – Cell Phones and Gas Pumps

Name_____Class _____

Directions:
Before: Before reading any articles or watching any videos, read the statements and decide if you "A," agree, or "D," disagree, with them.

After: At the end of this lesson, reread the statements and "A," agree, or "D," disagree, using evidence from the readings and videos to defend your final decision.

Before Agree/Disagree	Statements	**After** Agree/Disagree	**After** Reasoning of final decision
	Cell phones are <u>likely</u> to cause fires at gas pumps.		
	Fuel vapors at the gas pump can catch fire.		
	Static electricity causes fires at the gas pump.		
	If you discharge static electricity, you lower the chances of starting a fire at the gas pump.		

Guided Note-taking and Two-column Worksheet

Directions: These comments on a website forum all address the cell phone explosion myth. Highlight the ideas you find most important, and then fill out the two-column chart below.

Thread: Cell Phones Cause Explosions near GAs??
07-10-2002, 01:34 PM#1
bgross1070
Junior Member
Join Date Jul 2002
Location
Suisun City
Posts
1
Cell Phones Cause Explosions near GAs??
I received a safety flyer at work stating that Shell Oil has put out
warning notices that in three cases, while fueling cars, a cell phone caused explosions and fires. One time it was sitting on the trunk of a car and rang, causing a fire, and in two cases the people holding the nozzle were talking on the phone and it caused a fire. It did not say where this happened. Has anyone heard of this?? Or is it another urban legend?

07-10-2002, 01:47 PM#2
MalahatTwo7
MembersZone Subscriber
Join Date
Mar 2002
Posts
12,837
I can't speak for the "official" side of this, however many of our fueling stations do have signs posted that state Cell Phones are not to be used within something like 50 feet of the pumps.

It isn't posted at all of them, but it stands to reason that the phone works on a signal much like a radio in your car. When you transit through an area where they are blasting, there are always signs posted to remind motorists to turn their radios off during the transit. In any case not using the phone near the pumps would be a reasonable precaution.

07-10-2002, 01:48 PM#3
Adze39
IACOJ Agitator
Join Date
Apr 2000
Posts
2,771

That is why Exxon and other gas stations have signs that say not to use cell phones while pumping gas.

It has something to do with gas fumes and possible sparks (or static electricity) created in the interior of the phone casing. If you do a search on the Internet, I am sure you will find a better explanation.

Or you can wait for our Minister of Propaganda to find a news report regarding the topic and read it when he posts it. 

However after a quick search on the Internet, it seems like so far there have been no cases of such a thing happening. It is mostly regarded as an urban legend, but the gas companies posts signs anyway to be cautious.
Last edited by Adze39; 07-10-2002 at 01:53 PM.
http://www.firehouse.com/forums/t38761/

Key Ideas	Response/Connections/Questions Agree or Disagree?

Name: _____

Article:
Author:
Date:

Guided Notes	Agree or Disagree? Give Explanation/Evidence
• Who said it (reporter, expert in field, etc.)? • What is the purpose of the article? • Who created this site? Can you contact them? • Distribution of facts/opinions • Biased/unbiased • Accurate details • Verified information	

Rubric: Anticipation/Reaction Guide

Name: _____

Statements	Evidence is accurate (2)	Missing accurate evidence (1)	No evidence (0)
Cell phones are <u>likely</u> to cause fires at gas pumps.			
Fuel vapors at the gas pump can catch fire.			
Static electricity causes fires at the gas pump.			
If you discharge static electricity, you lower the chances of starting a fire at the gas pump.			

Rubric for Note-taking

Name: _____

Note-taking	Evidence from article is accurate (2)	Missing accurate evidence from article (1)	No evidence from article (0)
Author's purpose			
Free sharing information			
Presenting facts/opinions			
Biased/unbiased			
Accurate details			
Verified information			
Free flow of information			

Rubric: Compare and Contrast Articles

Note-taking (evidence from all 3 articles)	Completely verified in research/notes (3)	Partially verified in research/notes (2)	Attempted to verify, but with no details from research/notes (1)	No verification (0)
Who said it? Who are they?				
Can you contact the creator of site?				
Facts vs. opinion				
Biased vs. unbiased				
Accurate details				
Verified information				
Defending final decision (which article is most reliable/credible)				

Assessing Article Credibility

Name: _____ Date: _____

Topic:

Question:

Note-taking: information I need to research	The answer to the research

Which article is most reliable/credible? Why?

Matching Worksheet

Directions: Make copies for each group, and cut up the boxes into individual mini-cards for matching.

Charged particles that are opposite	attract
Charged particles that are alike	repel
Positively charged particles	protons
Negatively charged particles	electrons
Neutrally charged particles	neutrons
Visible energy that is a tiny version of a lightning bolt	Spark
A buildup of charge on an object and the shock is an example of this (releasing electrons)	static electricity
When gases are charged and come in contact with a spark	igniting fuel vapors
The electrons leaving (your body) and moving into another object (doorknob)	static discharge

Static Electricity Lab

Based on: http://www.sciencekids.co.nz/experiments/staticelectricity.html

They say opposites attract, and that couldn't be truer with these fun static electricity experiments. Find out about positively and negatively charged particles using a few basic items, and determine if can you control whether they will be attracted to or repelled from each other.

What you'll need: (groups of 3)

- Two inflated balloons with string attached
- Your hair
- Aluminum can
- Woolen fabric

Procedure: (Allow everyone in the group to try!)

1. Rub the two balloons one by one against the woolen fabric, and then try moving the balloons together. Make your observations in the data table.
2. Rub one of the balloons back and forth on your hair, then slowly pull it away and ask someone nearby what they can see. Make your observations in the data table.
3. Put the aluminum can on its side on a table. After rubbing the balloon on your hair, again hold the balloon close to the can and observe as you slowly move the balloon away from the can. Make your observations in the data table.

Data Table:

Steps in Procedure	Observations
#1 Rub the two balloons one by one against the woolen fabric. Then, try moving the balloons together.	
#2 Rub one of the balloons back and forth on your hair. Then, slowly it pull it away, and ask someone nearby what they observe in the process.	
#3 Put the aluminum can on its side on a table. After rubbing the balloon on your hair, again hold the balloon close to the can and observe what happens as you slowly move the balloon away from the can.	

Conclusions:

1. What is created when you rub the balloons against the woolen fabric or your hair?

2. Why do some objects attract one another while some repel one another? Describe what is happening scientifically.

3. When you rub your socks on a carpet in winter and then go to touch a door knob, you may see a spark before you get shocked by the door knob. How does a spark form (what are you really seeing)?

4. How can you get rid of the charge (static discharge) so that you don't get shocked?

What's happening? (used for class discussion/debrief after lab)

Rubbing the balloons against the woolen fabric or your hair creates static electricity. This involves negatively charged particles (electrons) jumping to positively charged objects. When you rub the balloons against your hair or the fabric, they become negatively charged because they have taken some of the electrons from the hair/fabric and left them positively charged.

They say opposites attract, and that is certainly the case in these experiments. Your positively charged hair is attracted to the negatively charged balloon and starts to rise up to meet it. This is similar to the aluminum can, which is drawn to the negatively charged balloon as the area near it becomes positively charged.

In the first experiment, both the balloons were negatively charged after rubbing them against the woolen fabric, and because of this they were repelled by each other.

A spark is visible energy that is a tiny version of a lightning bolt. It is electrons leaping from a high-charged area (you) through the air to a lower oppositely charged area (door knob). The shock is an example of static electricity, and when the electrons are released and the object no longer has a buildup of charge that is static discharge.

News Literacy Model Curriculum in Science Grades 9-10

Lesson 5: Ebola — Truth and Hype

Lesson 5

Ebola — Truth and Hype

The aim of this lesson is to enable students to maneuver through the confusing landscape of the Internet and be critical analyzers of Internet sources. This lesson emphasizes the need for critical thinking in both science and the news by encouraging students to question what they are reading on the Internet. The lesson can be a stand-alone lesson with minimal knowledge about immunology. This lesson emphasizes the acquisition of news literacy skills and critical thinking skills by allowing students to systematically question sources of information.

Grade Level: 9-10
Estimated Time: 3-5 class periods

Learning Objectives
Students will:

- Use essential news literacy questions as well as website evaluation questions to decipher online texts.
- Understand that the First Amendment protects many types of speech and press.
- Share what they know, what they want to know and where they get their news regarding Ebola.
- Develop critical thinking skills to question information provided by a predetermined news sources found on the Internet.
- Establish conclusions regarding their responsibility in reporting accurate information.

Guiding News Literacy Question: Why is the First Amendment protection of free speech so vital to democracy?
The 2014 Ebola outbreak is just one example of how current events—especially those that are misunderstood and that can evoke fear— are prime targets for misinformation. When events like these occur, students can apply basic news literacy principles to their news media consumption to protect against an influx of hype and fear. In doing so, they learn that the First Amendment does, indeed, protect speech even when it creates fear or isn't entirely accurate. Knowing this, students will learn that the impetus to stay informed lies solely in their hands.

Common Core State Standards

RST.9-10.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
RST 9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept;

	provide an accurate summary of the text.
RST 9-10.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.
RST 9-10.8	Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
RST 9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Next Generation Science Standards

Science and Engineering practices	Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories.
Science and Engineering Practices	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
Structures and Processes	Scientific Investigations Use a Variety of Methods Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings. (HS-LS1-3)

Materials

Computer with Internet
Display Board
What Do You Know Chart
News Literacy Worksheet
Is That True? Ebola Worksheet
Is That True? Ebola Worksheet Teacher Guide
White board
Internet Access

Preparation
Copy handouts and check to make sure the online websites are available for when the discussions end.

Websites and Resources
Teaching the First Amendment
http://1forall.us/

The News Literacy Project
http://thenewsliteracyproject.org/lesson-consumers-guide-sourcing-news-reports

Ebola outbreak lesson plan:
http://www.pbs.org/newshour/extra/lessons_plans/ebola-outbreak-lesson-plan/

Ebola Movie and Lesson Plans (with Tim and Moby):
https://www.brainpop.com/health/diseasesinjuriesandconditions/ebola/

Meredith Wright, 11/17/14, "Ebola: A Crisis in Science Literacy." Rockefeller University
https://incubator.rockefeller.edu/ebola-a-crisis-in-science-literacy/

Focus on News Literacy:
http://learning.blogs.nytimes.com/category/journalism/?_r=1# See Video

http://blogs.plos.org/speakingofmedicine/2014/10/22/ebola-taught-us-crucial-lesson-views-irrational-health-behaviors/

Victor Luckerson, "Fear, Misinformation, and Social Media Complicate Ebola Fight." Oct. 8, 2014, http://time.com/3479254/ebola-social-media/

Sharon Shahid, October 21, 2014, "NEWS IN THE TIME OF EBOLA."
http://www.newseum.org/2014/10/21/news-in-the-time-of-ebola/

Instructional Plan

Introduction to the First Amendment

In full class discussion, ask: What does the First Amendment mean to you?

You may want to write the text on your white board and ask students to interpret the 45 words of the First Amendment:
"Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances."

Note: It is recommended the teacher become familiar with the First Amendment and the rights therein by reading about the content from a reliable source:
http://1forall.us/

Continue to ask related questions (such as those provided below). Have the students pause and carefully think about each question before they respond verbally.

- Do you know where this statement is from?
- What do you know about the First Amendment?
- Why is the First Amendment important?
- To whom does the First Amendment apply?
- Does this amendment apply to you?

Explain that these questions relate to two guiding questions that will frame our lesson today. Those questions are:

1. What happens when you are given false information from the press, and how does the First Amendment protect you?

The answer, simply put, is "it doesn't. Click on the link below and project the FAQs on a screen for students to follow along. Read #13 aloud: "**Does 'freedom of the press' mean the news media can say or write anything they want?**
http://1forall.us/

Explain that "unless restricted by a valid prior restraint (which is rare), the news media are free to publish any information or opinion they desire, but this doesn't keep them from being held liable for what they publish. A newspaper that publishes false information about a person, for example, can be sued for libel. A television station similarly can be sued if it broadcasts a story that unlawfully invades a person's privacy. Because such liability can be staggering, most journalists strive to exercise their freedom to publish in a responsible and ethical manner."

Ask: *Do you think that it's ultimately a good thing that we can write our opinions and publish information?* Explain that despite the risk of being wrong, being able to publish freely is important because it helps citizens stay informed, engaged, and provides an outlet for personal expression. The news media is one such outlet that is allowed to publish freely, even when they might not always have the right information or the whole story.

Ask: "*What does it mean to be "news literate" and why does it matter in your life?"*

Student feedback to this question will vary and should include statements such as: "so I am not taken advantage of, so I'm not lied to when I go and buy a product I think it important," and "so I don't treat people unfairly, or be treated unfairly myself."

In your discussion, be sure to tie in that we do not have laws that say we must be informed citizens. Instead, it is our civic duty and responsibility to seek out and learn the "right" information in order to make the best choices possible. If citizens are not informed, then they can be taken advantage of.

Explore news literacy principles
Follow-up this introduction discussion by passing out the handout called the New Literacy Standards. Read the headings of the six principles of news literacy aloud to the students. The teacher will reiterate and accentuate that it is important to question what they are reading. Teacher should have students highlight the objectives on their worksheets so students can see what the aim of the new literacy principles are and how they will be using them in tomorrow's lesson.

Using the handout, students will begin to come up with questions they have developed to address each of the standards discussed.

If time is a constraint, use the second News Literacy Principles worksheet with questions already generated.

Using news literacy principles to understand Ebola
Once students are finished coming up with questions, review the literacy standards together in class as well as what questions the students created. Write these questions on a visible board in order to use those questions while completing the Website Evaluation Sheet.

Discuss the What Do You Know Chart regarding what they know about Ebola and if they can tell whether what they know is fact or fiction. The teacher may want to research Ebola prior to class so false information can be debunked with supporting research found by the teacher. You also want to know by looking at the resources from where the students are getting their information.

Using a projector and computer, conduct a simple Google search by typing in "What is Ebola," and show the students how much information is out there. Then, ask the key question of this activity: "Is that accurate?"

As a class, look at the questions from the What Do You Know Chart and what they want to know. See how they are performing their research and ask how they know the source they are using is reliable. Hand out the Website Evaluation Sheet. As a class, walk through the process of evaluating the National Report Website together and have the students repeat the exercise by evaluating the cdc.gov website on their own for homework. Use the Website Evaluation Teacher Guide for answers.

Day 3: Debunking misinformation and reporting reliable information
Students will now take their original information from the KWL chart and modify their work independently. If the student's information is accurate, they need to verify the information using a reliable resource. The students can use the www.cdc.gov website.

Students also need to research their "Want to Learn" column, again using a reliable resource and appropriate citations. If the student opts to use a different site, he or she needs to site the research using an appropriate format such as MLA or APA. The student should also be able to say with some level of certainty following the Website Evaluation Sheet that the resource is, in fact, an accurate one. The teacher may require the student to fill out a Website Evaluation Sheet for the source given by the student. When all the accurate information is collected and checked, continue to the culminating activity.

Optional modification: Have students fact-check each other's resources instead of relying on the teacher to check work.

Day 4: Class bulletin board of facts and myths about Ebola
Create a compilation fact sheet of what the students knew coming in, if it was accurate or not, whether they amended their information and what/where they learned the information. See Ebola Fact Sheet Example for an exemplar.

Create a fact/fiction bulletin board with 8.5" x 11" paper of what students found as fact and fiction. Fact constitutes a statement supported by a reliable resource. Fiction constitutes a statement not support by a reliable resource. Using the 1st Amendment as a heading or a border, instruct students to put the main facts they found on different color paper. You can have the students delineate fact from fiction by using different colors. You can also have this displayed and have other students from another class (like English) come by and peer-review what is written.

Materials: Facts and Myths About Ebola

1. What Do You Know? Chart
2. News Literacy Principles
3. News Literacy Questions
4. News Literacy Questions (generated)
5. Website Evaluation Sheet
6. Website Evaluation Sheet Teacher Guide
7. Extension Idea

What Do You Know Chart

Directions:
Part 1: Use this chart to record your thinking before, during and after learning about news literacy and Ebola. To begin, use the "What do I 'Know' about Ebola" column to make a list of things you believe you already know about the topic before you begin this unit.

Next, fill in the "What do I Want to Know about Ebola" column, making a list of questions that occur to you either before our lesson starts or after class discussion. Lastly, answer the column on where you get your news. Be as specific as possible (i.e. not just "the Internet" but "Wikipedia").

Part 2: At the end of the unit, answer the questions you had about Ebola and provide a reliable source in the column "Reliable Resource with Research in Answering my 'Want to Know.'" Next, visit the "What do you 'know' about Ebola" column and research if your knowledge is accurate or inaccurate.

What do I "Know" about Ebola.	What do I Want to Know about Ebola	Where I get my News	Reliable Resource with Research in Answering my "Want to Know."	Do I need to change what I know? Use a reliable source.

NEWS LITERACY PRINCIPLES

Name _____

These six principles are to guide producers and consumers of news and information. Underline key ideas/phrases to keep in mind while learning about news and information.

1. Free expression is the foundation — the cornerstone — of democracy

- The First Amendment is based upon the conviction that all human beings have inalienable rights. The foundation of journalism is the professionals' understanding of their obligation to accurately, thoroughly and completely inform their communities, so people may become more effective and active citizens. This notion of civic responsibility will empower communities to make enlightened decisions, to express their disagreements and to seek common ground.
- When ideas are allowed to flourish, it is the public's responsibility to determine what ideas and concepts to accept and which to embrace, to question or to reject. The First Amendment is based on the premise that people who can freely share information (especially about their government) will be informed and able to make sound choices about what leaders to elect, to take responsibility for the welfare of their communities and to respect the rights of people with different viewpoints and beliefs.

2. Discerning fact from opinion is a basic skill – and obligation

- Journalists must clearly separate and label fact from opinion in their reporting of information to communities and they should make concerted efforts to ensure that citizens know how to tell the difference. This includes news and news analysis, the news organizations' and individuals' opinions (columns, commentary, editorials, letters to the editor), advertising, advocacy ads and advocacy reporting.
- The public must make it a priority to learn the difference between fact and opinion and make it a skill to help others in their communities know the difference. Individuals must wield the right to challenge what communicators claim is fact and what is opinion. People must demand transparency and credibility of information. Readers and viewers must look at information beyond their circle of comfort so they obtain complete and thorough data before acting. These obligations include evaluating what they receive and verifying what they develop on their own.

3. When the process of gathering and reporting is transparent, news and information are more meaningful, trusted and credible.

- Journalists must present information free of bias and agendas. They should clearly identify issues or limitations on that information, including reporting that the information might be incomplete or from questionable sources. Journalistic independence is essential to this process.
- Readers and viewers must understand a source's agendas, motivations and backgrounds so they can make full use of that information, assessing what is true. They need to insist on independent journalists, professionals free of outside obligation and limitation, so they can trust the information they receive. They need to hold media accountable for the quality of information delivered. If members of the public are news sources, they must identify their biases and be transparent in their actions.

4. Effective communication of news and information requires synthesis of multiple sources into meaningful context and comprehension of its impact

- Journalists must make sense of information, using the most credible and reliable resources, so audiences can make meaningful use of it, in context, with a minimum need for clarification. In short, journalists must get it *right*. And it must be presented in a relevant, engaging manner without sensationalism, speculation and bias.
- Citizens must take responsibility to make every effort to understand information received, including asking questions and pursuing their own versions of it. They must demand credible and reliable information sources, not infotainment based on information that is not *right*. And they must be taught the importance of seeking information of consequence.

5. Information requires verification to be effective

- Journalists must find the best resources and substantiate what they say. They should present information in coherent ways as well as keep it clear, meaningful and relevant. The purpose of news is not diversion but the sharing of usable and reliable information in an engaging and relevant way. Journalists must question sources without advocacy or disengagement. Journalists' roles can be called "engaged independence."
- Individuals must expect that the information they receive is accurate, thorough and reliably sourced and that the media delivering this information is responsible and credible. Communities must not accept information without critical thought and analysis, including comparison and evaluation. In evaluating such information, they should be involved, skeptical and challenging, in what they act on.

6. Information in today's society must empower forums to give voice to citizens and to monitor the free flow of information

- Journalists must reflect their communities, but, when the need arises, they must first be able to challenge a community's values and preconceptions to maintain the free and accurate flow of information. Journalists must report information from all stakeholders, especially from those who might not otherwise have a chance to be heard, by creating a forum that adheres to journalistic principles. Journalists are the "watchdog" for society. They can bring about change by being journalistically responsible as well as by offering voice to those traditionally unheard.
- Individuals should expect to have a forum to air their views. That forum must also involve the responsibility to listen to the views of others. Individuals can join journalists in the "watchdog" function not only of society but also of the media, and can also provide the important function of giving voice to those traditionally underserved.

Source: *the Radio Television News Directors Foundation through a grant from The McCormick Foundation. Special thanks to Carol Knopes, Developed by Candace Perkins Bowen, John Bowen, Wally Dean and Carol Lange.*

News Literacy Questions

Name _____

Principle of News Literacy	Synopsis	What is a Good Question to Ask?
1. Free expression is the foundation — the cornerstone — of democracy	The First Amendment is based upon the conviction that all human beings have inalienable rights. The foundation of journalism is the professionals' understanding of their obligation to accurately, thoroughly and completely inform their communities, so people may become more effective and active citizens. This notion of civic responsibility will empower communities to make enlightened decisions, to express their disagreements and to seek common ground. When ideas are allowed to flourish, it is the public's responsibility to determine what ideas and concepts to accept and which to embrace, to question or to reject. The First Amendment is based on the premise that people who can freely share information (especially about their government) will be informed and able to make sound choices about what leaders to elect, to take responsibility for the welfare of their communities and to respect the rights of people with different viewpoints and beliefs.	
2. Discerning fact from opinion is a basic skill – and obligation	Journalists must clearly separate and label fact from opinion in their reporting of information to communities and they should make concerted efforts to ensure that citizens know how to tell the difference. This includes news and news analysis, the news organizations' and individuals' opinions (columns, commentary, editorials, letters to the editor), advertising, advocacy ads and advocacy reporting. The public must make it a priority to learn the difference between fact and opinion and make it a skill to help others in their communities know the difference. Individuals must wield the right to challenge what communicators claim is fact and what is opinion. People must demand transparency and credibility of information. Readers and viewers must look at information beyond their circle of comfort so they obtain complete and thorough data before acting. These obligations include evaluating what they receive and verifying what they develop on their own.	
3. When the process of gathering and reporting is transparent, news and information are more meaningful, trusted and credible.	Journalists must present information free of bias and agendas. They should clearly identify issues or limitations on that information, including reporting that the information might be incomplete or from questionable sources. Journalistic independence is essential to this process. Readers and viewers must understand a source's agendas, motivations and backgrounds so they can make full use of that information, assessing what is true. They need to insist on independent journalists, professionals free of outside obligation and	

	limitation, so they can trust the information they receive. They need to hold media accountable for the quality of information delivered. If members of the public are news sources, they must identify their biases and be transparent in their actions.	
4. Effective communication of news and information requires synthesis of multiple sources into meaningful context and comprehension of its impact	Journalists must make sense of information, using the most credible and reliable resources, so audiences can make meaningful use of it, in context, with a minimum need for clarification. In short, journalists must get it *right*. And it must be presented in a relevant, engaging manner without sensationalism, speculation and bias. Citizens must take responsibility to make every effort to understand information received, including asking questions and pursuing their own versions of it. They must demand credible and reliable information sources, not infotainment based on information that is not *right*. And they must be taught the importance of seeking information of consequence.	
5. Information requires verification to be effective	Journalists must find the best resources and substantiate what they say. They should present information in coherent ways as well as keep it clear, meaningful and relevant. The purpose of news is not diversion but the sharing of usable and reliable information in an engaging and relevant way. Journalists must question sources without advocacy or disengagement. Journalists' roles can be called "engaged independence." Individuals must expect that the information they receive is accurate, thorough and reliably sourced and that the media delivering this information is responsible and credible. Communities must not accept information without critical thought and analysis, including comparison and evaluation. In evaluating such information, they should be involved, skeptical and challenging, in what they act on.	
6. Information in today's society must empower forums to give voice to citizens and to monitor the free flow of information	Journalists must reflect their communities, but, when the need arises, they must first be able to challenge a community's values and preconceptions to maintain the free and accurate flow of information. Journalists must report information from all stakeholders, especially from those who might not otherwise have a chance to be heard, by creating a forum that adheres to journalistic principles. Journalists are the "watchdog" for society. They can bring about change by being journalistically responsible as well as by offering voice to those traditionally unheard. Individuals should expect to have a forum to air their views. That forum must also involve the responsibility to listen to the views of others. Individuals can join journalists in the "watchdog" function not only of society but also of the media, and can also provide the important function of giving voice to those traditionally underserved.	

Source: *the Radio Television News Directors Foundation through a grant from The McCormick Foundation. Special thanks to Carol Knopes, Developed by Candace Perkins Bowen, John Bowen, Wally Dean and Carol Lange.*

News Literacy with Questions Generated

New Literacy Principle	Synopsis	How to Question the News
1. Free expression is the foundation — the cornerstone — of democracy	Journalism has an obligation to be accurate, thorough and complete in their reporting in order to inform their communities in so that people may make educated decisions, but to also express their disagreements and to seek better understanding. It is the public's responsibility to determine what ideas and concepts to accept and which to embrace, to question or to reject. People can freely share information (1st Amendment) but should be informed about what they are sharing and be able to respect the rights of people with different viewpoints and beliefs.	**Just because I read it, does it mean it's true?** **Just because I heard a lot of times, does that mean it's credible?** **Just because I don't agree with the information, should I dismiss the information?**
2. Discerning fact from opinion is a basic skill – and obligation	Journalists must clearly separate and label fact from opinion in their reporting of information. The public must make it a priority to learn the difference between fact and opinion and make it a skill to help others in their communities know the difference. Individuals must use the right to challenge what communicators claim is fact and what is opinion. People must demand transparency and credibility of information. Readers and viewers must look at information beyond their circle of comfort so they obtain complete and thorough data before acting. These obligations include evaluating what they receive and verifying what they develop on their own.	**Is this the author's opinion or is it fact?**
3. When the process of gathering and reporting is transparent, news and information are more meaningful, trusted and credible.	Journalists must present information free of bias and agendas and clearly identify issues or limitations on that information, even if it might be incomplete or from questionable sources. Readers and viewers must understand a source's agendas, motivations and backgrounds so they can make full use of that information, assessing what is true. They need to insist on independent journalists, professionals free of outside obligation and limitation, so they can trust the information they receive. They need to hold media accountable for the quality of information delivered. If members of the public are news sources, they must identify their biases and be transparent in their actions.	**Is there a bias in the way it is represented?** **Is the information complete and from accurate sources?**
4. Effective communication of news and information requires synthesis of multiple sources into meaningful context and comprehension of its impact	Journalists must make sense of information, using the most credible and reliable resources. This way the audience can make good use of it. Journalists must get it *right* and it must be presented in a relevant manner without sensationalism, speculation and bias. Readers must take responsibility to understand information received, including asking questions and pursuing their own versions of it and understand what could happen if incorrect information continues to be perpetuated.	**How many sources can I find that support this claim?**

5. Information requires verification to be effective	Journalists must find the best resources and substantiate what they say. The information should be clear, meaningful and relevant. The purpose of news is not diversion but the sharing of usable and reliable information in a meaningful way. Individuals must expect that the information they receive is accurate, thorough and reliably sourced. Communities must not accept information without critical thought and analysis, including comparison and evaluation. In evaluating such information, they should be involved, skeptical and challenging.	**Is the source reliable?** **Do I need to research further?** **Does it make sense?**
6. Information in today's society must empower forums to give voice to citizens and to monitor the free flow of information	Journalists must report information from all stakeholders, especially from those who might not otherwise have a chance to be heard, by creating a forum that adheres to journalistic principles. Journalists are the "watchdog" for society. They can bring about change by being responsible for what they report as well as by offering voice to those traditionally unheard. Individuals should expect to have a forum to air their views. That forum must also involve the responsibility to listen to the views of others. Individuals can join journalists in the "watchdog" function not only of society but also of the media, and can also provide the important function of giving voice to those traditionally underserved.	**How can I communicate this to my peers and/or my community?** **How can I get someone to listen to me?**

Source: Edited from the Radio Television News Directors Foundation through a grant from The McCormick Foundation. Special thanks to Carol Knopes, Developed by Candace Perkins Bowen, John Bowen, Wally Dean and Carol Lange.

"REALLY? Is that True about Ebola?"
The Web Page Evaluation Checklist

How do you know you can believe what you read? Do you rely on Wiki answers or Ask.com? How do you know what you're learning is quality information? Let's analyze this together. Find an article about Ebola and compare it to the CDC article. Research one link at a time**.** Use this checklist to evaluate the reading. Compare and contrast your results to see which has the better or more appropriate information. Make a conclusion statement about your findings.

Criteria	**Title and URL of page you are evaluating:**	**Title and URL of page you are evaluating:** "Ebola (Ebola Virus Disease) CDC" http://www.cdc.gov/vhf/ebola/index.html
What type of domain is it? Look at the .XXX What does it Mean? http://www.learnthenet.com/how-to/understand-domain-names/	Circle: .com. org **.net** .edu .gov. mil .us .other (list) **.NET:** For networks; usually reserved for organizations	Circle: .com. org .net .edu **.gov**. mil .us *.GOV: Reserved for United States government agencies
Who wrote the page? Search for Author (Control F)		
Who is the author? Google the Author		
What are their credentials? How do you know?		
Dated? Date _____ Current enough to gather accurate information on this topic?		
Sources marked with links or notations? Are they credible?		
Links to more resources? Do they work?		
Does the page have a good reputation?		
Search URL in www.whois.com Who owns the domain?		
Evidence of bias? Does the writer seem to be one-sided in his/her writing? Are they trying to convince you with their information?		
Why do you think the page was put on the Web?		
How can I get good information about my subjects and my topic: **http://www.ipl.org/**		

"REALLY? Is that True about Ebola?" The Web Page Evaluation Checklist Teacher Guide

How do you know you can believe what you read? Do you rely on Wiki answers or Ask.com? How do you know what you're learning is quality information? Let's analyze this together. Search the two links provided. Research one link at a time. Use this checklist to evaluate the reading. Compare and contrast your results to see which has the better or more appropriate information. Make a conclusion statement about your findings.

Criteria	Title and URL of page you are evaluating:	Title and URL of page you are evaluating: "Ebola (Ebola Virus Disease) CDC" http://www.cdc.gov/vhf/ebola/index.html
What type of domain is it? Look at the .XXX What does it Mean? http://www.learnthenet.com/how-to/understand-domain-names/	Circle: .com. org **.net** .edu .gov. mil .us .other (list) **.NET:** For networks; usually reserved for organizations	Circle: .com. org .net .edu **.gov**. mil .us *.GOV: Reserved for United States government agencies
Who wrote the page? Search for Author (Control F)	Will vary	Not listed
Who is the author? Google the Author	Will vary	None Listed
What are their credentials? How do you know?	Will vary	It's a government website; probably good credentials.
Dated? Date _____ Current enough to gather accurate information on this topic?	Will vary	Page last updated: November 20, 2014 Yes
Sources marked with links or notations? Are they credible?	Will vary . Be wary of adware; "Adchoice"	Yes
Links to more resources? Do they work?	Will vary	Yes
Does the page have a good reputation?	Will vary	Yes
Search URL in www.whois.com Who owns the domain?	Will vary	**Government**
Evidence of bias? Does the writer seem to be one-sided in his/her writing? Are they trying to convince you with their information?	Will vary	Maybe; read the information to confirm.
Why do you think the page was put on the Web?	Will vary: Inform Persuade Sell **Joke /Misinform** Other: Satire	Circle: **Inform** Persuade Sell Joke /Misinform Other: Educate
How can I get good information about my subjects and my topic: **http://www.ipl.org/**	Will vary	None given

Critical Thinking and Analysis: Which web page is appropriate for your purpose? Why? Remember when you learned that everything can be found on the Internet even if you delete it? Well, it's true, and we can! Go to www.archive.org.

Extension Idea: Students can find a video or other media report and use the Webpage Evaluation Sheet along with the News Literacy Questions to report back on what's in the news.

News Literacy Model Curriculum in Science Grades 9-10

Lesson 6: Water in the United States

Lesson 6

Water in the United States

This lesson examines the sources of information used in articles regarding current water issues in the United States with a focus on the drought in the West. Students learn a seven-factor method for evaluating sources and apply this method to their own articles. Finally, students write an essay based off their findings.

Grade Level: 9-10
Estimated Time: 90 minutes or two class periods

Learning Objectives
Students will:

- Explain seven factors used to evaluate sourcing (the "Saltzman Seven")
- Apply these criteria to a news article to evaluate the quality of its sourcing.
- Analyze the content of a newspaper article.
- Write an essay discussing the water issue in the United States using articles from class.

Guiding News Literacy Question: Why does news matter?
Few things are as contentious as our nation's limited and precarious water supply. By reading news articles from reputable sources, students will be better prepared to consider the importance of the water supply in our country. Additionally, using the News Literacy Project's Saltzman Seven worksheet will help them understand how to analyze news sources for bias or inadequate content.

Common Core State Standards

RST.9-10.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
RST 9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
RST 9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Next Generation Science Standards

Science and Engineering practices	Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent

	student-generated sources of evidence consistent with scientific ideas, principles, and theories.
Science and Engineering Practices	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
Structures and Processes	Scientific Investigations Use a Variety of Methods Scientific inquiry is characterized by a common set of values that include: logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings. (HS-LS1-3)

Prior Knowledge

It is expected that students will have an understanding of the water cycle. It may be necessary to discuss the drought conditions that exist in the middle/western part of the country to provide some starting information for this lesson.

Materials

Water in the United States PowerPoint Presentation
Saltzman Seven Graphic Organizer Worksheet
http://thenewsliteracyproject.org/sites/default/files/GO_Sourcing_FINAL%281%29_2.pdf
Articles for Student Research (see list under websites)
Evaluation Sources Video
http://thenewsliteracyproject.org/lesson-consumers-guide-sourcing-news-reports
Optional Writing Rubric
http://www.readwritethink.org/files/resources/printouts/Persuasion%20Rubric.pdf

Websites and Resources

1. http://www.nbcnews.com/science/environment/could-californias-powerful-storm-end-drought-not-likely-n259796
2. http://news.nationalgeographic.com/news/2014/08/140819-groundwater-california-drought-aquifers-hidden-crisis/
3. http://www.popsci.com/article/science/what's-world-do-about-water
4. http://www.usatoday.com/story/money/business/2014/06/01/states-running-out-of-water/9506821/
5. http://www.nytimes.com/2014/10/15/business/economy/the-price-of-water-is-too-low.html?_r=1
6. http://www.nbcnews.com/storyline/california-drought/california-needs-11-trillion-gallons-water-end-drought-nasa-n269546

Instructional Plan

Introduction to the topic
Use the Water in the United States PowerPoint to discuss where we get our news from — newspapers, the Internet, TV. Ask students about any current events (they do not have to be science-related) in which information that was provided via TV news or via Internet news sites was later determined to be incorrect.

Ask: *How did you find out the information was wrong? Through the same source that originally provided it? Did that affect the way you viewed that source?*

Ask students if they think most information that appears in these media venues is always factual. *Why or why not? How would they know?*

When you get to the slide that links to the video about evaluating media, pause to pass out the Salztman Seven worksheet. Then, watch the linked video.

After watching the video, return to the PowerPoint (slide 6) for a teacher-led discussion about water use in our community and across the country with student input.

Group activity and application
Following the water usage discussion, divide students into four pre-assigned groups with four-five students in each group. If the class is larger, it is up to the teacher's discretion to add more students to groups or create a 5th group with a different article.

Groups should be sorted by clumping students of similar abilities together so the teacher can assign longer articles to more proficient readers and shorter articles to students that struggle with reading. All students are expected to read and contribute to the group activity.

Explain to the class that each group is assigned a different article selected by the teacher from various Internet news sources. They will read their assigned articles for homework and analyze the factual content using the Saltzman Seven worksheet criteria.

Day 2: Class share
Students should begin the class seated with their group members and should discuss their individual analyses within each group for about five minutes (max of 10).

Then, regroup as a class to summarize each article and discuss its sources. Assign a group reporter for each group. This reporter should record what the groups feels

are important points in their notes. As a class, record the summaries on the white board for each article as each group presents their key points. Students should take notes from the board for each article to assist them with the writing assignment that concludes this activity.

Assessment and class reflection

Once the class discussion is finished, pass out the writing assignment sheet (found in the materials section). Go over the directions, and answer any questions students might have about the prompt.

To help students brainstorm for their paper, ask them to consider why, when discussing an issue this important, expert and nonbiased sources are so important.

Ask: *How did the Saltzman Seven method change the way you look at sources and information? How can you apply that method to finding information about water?*

Individually, students will write a one-two page essay discussing the water issue in the United States. Using any of the articles read and discussed in class, students should explain the severity of the water issue in the United States. Students are welcome to find another article to support the topic. A link to an optional rubric is provided under the websites section (but not in the materials due to copyright). Slide 7 can be put up while discussing the essay.

Materials: Water in the United States

1. PowerPoint Presentation
2. Writing Assignment Sheet

"The Water Issue in the United States" Writing Assignment

The culminating assignment to "The Water Issue in the United States" lesson is to write an essay explaining the severity of the water issue in the United States. You may use any of the articles we discussed in class. You are encouraged to find another article to support the topic. As you discuss the issue, you should consider the expert opinion in the sources provided and what questions are still unanswered.

The paper should meet the following criteria:

- One-two pages
- 12 point font
- One-inch margins
- Proper sentence structure, good grammar, mechanics and spelling
- Citations for any extra articles used

News Literacy Model Curriculum in Science Grades 9-10

Lesson 7: Weekly Earth Science Reading

Lesson 7

Weekly Earth Science Reading

This lesson aims to develop a weekly reading habit for students in grades 9–10. Students will select and review a grade-level-appropriate Earth and space science news article from print or electronic sources. Students will summarize the article in a prescribed way and orally present their work to the class on a rotating basis. Supporting activities that help students understand how to critically analyze science news articles are included as teacher-led discussions and group activities.

Grade Level: 9–10
Estimated Time: This is a semester-long assignment. The assignment is due on the first day of each week that the course is in session, for a total of 17 weeks in a block schedule format. Three students present their work and field questions on the first day of every week, which takes approximately 10 minutes per student.

Learning Objectives
Students will:

- Use aspects of personalized learning to increase their scientific literacy.
- Critically analyze the reliability of the information they read in the articles that they choose.
- Understand that reporting bias can be either intentional or unintentional.
- Understand that there are different levels of reliability in the various sources that report science news.
- Select age- and content-appropriate news articles of interest from a variety of sources.
- Summarize the contents of the news article using proper structure and writing conventions, including a proper reference citation.
- Establish connections of the news article to the course of study, provide their opinion of the importance of the information in the article and assess the veracity of the source.
- Orally present their work to the class and then field questions from their peers and teacher about the content of their presentation.
- Create a file of all of the news articles they review over the course of the semester as an artifact for their proficiency-based learning portfolio.

Guiding News Literacy Question: What challenges and opportunities do the Internet and digital media create?
Thanks to the Internet, students can now become experts at almost anything. It's simply a matter of helping them to develop ongoing reading habits that encourage them to read wide and deep across a variety of subjects. Students who learn to love seeking out new knowledge and who can identify the best articles will become lifelong learners.

Common Core State Standards

RST.9-10.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
RST 9-10.2	Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
RST 9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.
W.3.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Next Generation Science Standards

Earth's Place in the Universe/Space Systems	Varies depending on article chosen.
Earth's Systems/History of Earth/Weather	Varies depending on article chosen.
Earth and Human Activity/Climate	Varies depending on article chosen.
Engineering Design	Varies depending on article chosen.

Materials

Internet access for entire class in a school computer lab
Print resources for science news articles
Word processers for each student
Classroom projection system (optional)
Reference materials about writing conventions
WRA project overview handout with grading parameters
Rubric for oral presentation
Scientific literacy handout

Structured Weekly Reading Project

This version of the Weekly Reading Assignment is for students on educational plans to help them "unpack" a selected and leveled science news article. Special educators will help the students choose an appropriate news article for the students based upon their reading and comprehension level. The students will work autonomously on this version of a differentiated Weekly Reading Project and ask for assistance when they feel the need.

Scaffolded Weekly Reading Project

This version of the Weekly Reading Assignment is a more basic version but still guides a student through the information contained in a science news article. Students will work on this differentiated assignment over time during their Supported Study block with the close assistance of a para educator. If students meet success with this version they may transition to the more autonomous version if deemed appropriate by the supervising educators.

Websites and Resources

https://student.societyforscience.org/topic/earth-sky

https://www.sciencenews.org/

http://www.sciencedaily.com/

https://newsela.com/articles/?category=science

http://www.scientificamerican.com/

http://www.nytimes.com/pages/science/index.html

http://www.nbcnews.com/science

http://www.weather.com/science

http://www.bbc.com/news/science_and_environment/

http://www.usgs.gov/newsroom/#.VG6aU8nyD1I

Instructional Plan

Note: Explaining the assignment to students and engaging in a conversation about the nature of scientific texts will take a class period. After that, students will work on their first reading assignment. Each week for the duration of the semester, pick three students to begin the week with their reading presentations.

Explaining the assignment

Provide students with the handout that outlines the learning intentions of the project and the requirements for its structure. Project the document on the screen (if available) and review the contents of the document and answer questions about the parameters of the project.

Discuss levels of quality and timelines for completion based on your classroom needs. A discussion of plagiarism and how to cite a reference should be included in the introduction.

As a class discussion, ask the students to define the term plagiarism, and have them describe how it usually occurs. Have the students describe why plagiarism is something that they should not do. Continue the class discussion about citing references, and ask them where they have used references in other classes they have been in. The discussion may reveal a number of student misconceptions about plagiarism and how to cite references correctly. If needed, use the links below to deliver a short lesson about plagiarism and reference citation.

1. http://library.stevens.edu/plagiarism
2. http://www.plagiarism.org/
3. http://www.slideshare.net/caitlingillmett/plagiarism-and-citation-basics?qid=51c41598-9291-4ed7-b68e-ebbc9971ce2d&v=qf1&b=&from_search=1
4. http://www.slideshare.net/amjanney/plagiarism-1948862?related=1

Now, take students to the computer lab to browse selected sites that offer age-appropriate science news articles. Give students time to select an article of interest for their first submission. Instruct students to use the list of websites provided under the websites and resources section to find their first article.

Understanding scientific texts

Once students have chosen their first topics, engage them in a discussion about reading scientific texts. Explain that the Internet offers innumerable types of science articles, all with differing levels of accuracy and reliability. Explain to students that one way to determine how truthful or reliable a website might be is to look at the domain name. Write different domain suffixes on the board (.com, .org, .net, .edu, .gov) and explain the difference between each.

Then, put students in groups to read and discuss the contents of the article, "*How to*

Discuss Science in the Age of Cable News," from the following website:
http://www.realclearscience.com/blog/2013/08/how-to-discuss-science-in-an-age-of-cable-news.html

Students will recognize that freedom of speech carries with it the need for "freedom of skepticism" to determine where truth is found in the news. Explain that even scientific news is met with skepticism at times because we know that science is always evolving.

Students practice this skill by relating their opinion of the content of their science news article in their written work and their presentations. Students will learn about the value of looking for primary sources when accessing science news articles at websites that summarize professional journal articles for more general use (Wikipedia, Science Daily, Science News, etc.).

Emphasize for students that when they have doubts about the reliability of information, they should corroborate the information by checking other sources. As a class, examine the primary source citations on a Wikipedia page about a controversial topic located at:
https://en.wikipedia.org/wiki/Global_warming_controversy

Sometimes, it's helpful to understand the difference between a scientific text and other print resources. Back in their groups, direct students to read *"20 Tips for Analyzing Claims of a Scientific Study"* at the following site before the activity:
http://www.realclearscience.com/blog/2013/11/20_tips_for_analyzing_claims_of_a_scientific_study.html

In their groups, students should discuss which tips will be most helpful for them, and which tips they might already practice in their own reading habits.

Optional modification/addition: Explain to students that on occasion, they will be assigned pro or con sides on topics for their weekly reading assignments (eg. fracking, climate change, natural resource use, space exploration, etc.). These topics will help facilitate class discussion about bias in news reporting. Students will discern what a scientific fact is and what is opinion in the news article they selected. Controversial science topics found at:
http://www.realclearscience.com/blog/2013/12/our_most_controversial_science_articles_of_2013.html

Materials: Weekly Science Reading

1. Understanding By Design Lesson Plan (for teacher use)
2. Weekly Reading Assignment
3. Scaffolded Weekly News Reading Project
4. Structured Weekly Reading Project
5. Oral Presentation Rubric

Science News Literacy- Understanding by Design Lesson Plan

Stage I – Desired Results

(All alphanumeric codes and accompanying text are from the 2013 Next Generation Science Standards)

Established Goal(s):

- Students in a freshman level earth science course will demonstrate the ability to select, summarize, and reflect upon, the content of current geoscience related articles found in a variety of news media sources.
- Students will develop and defend an opinion of the veracity of the contents of the article they selected.
- Students will demonstrate poise in the oral presentation of their summaries to their peers in the class.
- Students will solicit feedback from the class after their presentation and respond to that feedback appropriately.

Understandings: Students will understand that…

- Scientific literacy is enhanced by learning about current scientific news in the media.
- News reporting of any type may contain intentional and unintentional bias.
- Critical thinking and "informed skepticism" are important habits of mind when a reader is evaluating new information found in the media.
- Sources of information can vary widely in their depth and accuracy of the information they report.

Essential Question(s):

- What is scientific literacy?
- What is unintentional bias and how does it occur?
- What is intentional bias and how is it used?
- How can a reader choose the most reliable print resources?
- How can students evaluate the accuracy of Internet sources?
- What is the value of reading opposing views?
- How does being skeptical support the process of accepting new ideas?

Students will know that…

- being scientifically literate is an important life skill that will allow them to make a variety of informed decisions.
- information they receive from the media may be incorrect for a variety of reasons.
- certain sources of information can be relied upon to be more accurate than others.
- quantitative information represented in graphs needs to be evaluated with care to be correctly interpreted.
- information about science is constantly being updated and often revised.
- presentation and listening skills are important in the pursuit of new knowledge.
- writing well using proper conventions and structure requires practice.

Students will be able to…

- Select geoscience news articles of interest written at grade level or above from a variety of sources.

- Use a defined format and proper conventions of writing to report on the news article they selected.
- Summarize the important information contained in the news article.
- Define the connections of the topic in the news article to the course of study in which they are enrolled.
- Express their opinion about the importance of the information they gleaned from the news article.
- Assess the veracity of the scientific information, and the level of confidence they have in the source.
- Properly cite the reference for the news article.
- On a rotating basis, present the information they learned to the class and then field questions from their peers and the teacher.
- Share the original news article electronically through Google Docs with the teacher so that it, and any associated images, can be projected on the board during the student's presentation.

Stage II – Assessment Evidence

- The student's written summary will be assessed for timeliness, format, writing conventions, and proper citation.
- The content of the written summary will be assessed for the quality of the summary, connections to the class content, students opinion of the importance of the news article and how reliable the student
- Student presentations will be assessed for clarity of speech, familiarity with the information they are presenting, poise, eye contact with audience, by using a rubric.

Performance Task(s):	Other Evidence or activities:
• Students will select a geoscience news article every week that is grade appropriate from electronic or print sources. • Students will prepare a typed summary of the information in the news article, including course and personal reflections and connections. • Students will assess the veracity of the information in the news article, and the reliability of the source. • Three students per week will present their summaries and reflections to the class on Mondays on a rotating basis. • Students in the audience will	• Students will assemble their entire collection of written news article reporting for the semester (18 pieces) into a portfolio. • Students will write a summary of their growth as a writer and consumer of scientific news as a cover sheet for their portfolio. • Students will submit their portfolio as a piece of evidence for their Proficiency Based Graduation Requirements in research and writing for our school. • Students will complete assigned work from the teacher about how to assess the reliability of various news sources using selected Internet sites.

actively listen to presentations by their peers and then ask relevant questions at the end of the presentation.	• Students will be assigned news readings from various sides of a topical geoscience issue and then defend and debate their assigned position in a structured class activity..

Stage III – Learning Plan

Learning Activities (Opportunities):
Description of the weekly reading assignment with a provided handout of the format and requirements of structure is performed at the beginning of the semester. *
A review of proper conventions of writing is led by the teacher.
Examples of the work of previous students are displayed using a document camera with a discussion about what was done correctly and what needed improvement.
A presentation about news reporting bias and the various levels of reliability of sources is conducted by the teacher.
*A modified version of the weekly reading assignment is available for students on educational plans.

Standards Addressed

Common Core English Language Arts Standards

Reading standards for informational text grade 9-10

8. Integration of knowledge and ideas in informational text.-Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false claims and fallacious reasoning. (p. 40)

College and Career readiness Anchor Standards in Writing

4. Production and Distribution of Writing- Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (p. 46)

10. Range of Writing- Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. (p.48)

College and Career readiness Anchor Standards for Speaking and Listening

2. Comprehension and Collaboration- Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source. (p.50)

3. Comprehension and Collaboration- Evaluate a speakers point of view, reasoning and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence. (p.50)

Standards reference- Common Core State Standards Initiative- NGA Center/CCSSO, owners and developers

Weekly Reading Assignment (WRA) for Science News Journalism

Scientific literacy means that a person is able to interpret simple and complex situations, presented in a variety of formats, in a logical manner. This is done by using thought processes that draw on one's knowledge of science and technology. To become more scientifically literate, one must stay current with the discoveries, research and other important issues that that are reported in various publications. In this class you will select and read a news article every week. Following that reading you will type a response to the article using the formatting checklist shown below. On a rotating basis, students will present what they read to the class using proper oral presentation skills.

This assignment is for the majority of students in the class. There are two optional accommodated assignments for students on educational plans that are referred to as Weekly Reading Projects. Separate documents describe those news journalism projects.

Writing Requirements

Start each paragraph as shown in boldface type below.

Paragraph 1. **The article I read describes…** (Summarize in your own words the facts in the article. Do not copy and paste text, or use long quotations. We will discuss the perils of plagiarism in class.)

Paragraph 2. **This article is important to (your science class name here) because…**(Provide a connection that is not simplistic to the field of study of your class.)

Paragraph 3. **I think that…**(What were your thoughts and reactions to what you read?)

Paragraph 4. **I think that the news source for this article was**…(Judge how reliable you think the news source was based upon our class discussions on how to evaluate the accuracy of scientific news journalism).

Formatting checklist

- In the upper left corner of your page, type your first and last name on the first line, and the due date and your class block on the second line.
- Center the title of your article in 14 point bold, Times New Roman font.
- The minimum length of your write up is 20 full lines of text using 12 point, Times New Roman font, with 1.5 spacing and margins no larger than 1.25 inches. You are encouraged to write more than the minimum. Do not copy and paste text from the article!
- Try to have each paragraph be similar in length and make solid connections and conclusions in paragraphs two, three and four.
- Properly cite a reference to the original article at the bottom of your write up.
- Do not cut and paste text or use numerous or long quotes.
- Come to class with a copy of the WRA already printed on the first day of the week.
- Save your work electronically in a place (school server, Google Docs) where you can easily access it if you are asked to share it in your presentation or to check for plagiarism.
- Have someone proofread your writing to avoid costly mistakes.
- Ask questions if you are unsure about this assignment.

WRA grading

The following deductions will be made from a possible 100 points for each WRA

-5 points if name, date, block information complete and in the proper location
-2 points for each line of missing text below the minimum of 20 lines. (Name, date, title and citation are not counted in the length requirement. Short lines of text are only counted as partial credit in that count.
-10 points for a missing reference or
-5 points for incomplete reference.
-10 points each day it is late.
-5 points if not printed at the start of the academic block.
-1 to -20 points for structure and spelling errors
-5 points for margin size and font and style errors
-5 points for poor condition of page (folds, wrinkles, stains, doodles, etc.)

This assignment may sound difficult, but because it is due every week you have plenty of time to work on it and do it well. You are being given the opportunity to personalize your learning about science because you get to choose what you want to know more about.

Being able to evaluate the accuracy of what you read in the news is an important life skill and being able to express your opinion in writing and the spoken word is also important.

If you are absent on the day the WRA is due it is your responsibility to see me when you return to turn in the assignment for that week.

The assignment is due on the first day of every week the class meets. If I do not remind you or write it on the agenda as homework it is still due the first day we meet the next week.

If you do not have a computer or printer at home use your time during the school week to complete this assignment.

We will discuss how to select news journalism websites and print resources we have in the school library. We will also discuss how to evaluate the reliability of those sources.

See me if you have any questions.

Scaffolded Weekly News Reading Project for Introductory Science Courses

Name (first and last)_____Block_____Date _____

Title of Article

_____

Source for the article

_____

This supported Weekly News Reading Project will help you to improve your reading and writing skills. The project will help you break a science news article into smaller pieces to make it easier for you to understand. You need to read a short news article every day for a week to look for different understandings. Fill in the following sections as you do each reading to show how you understand different parts of the news article.

Monday- Vocabulary. When you read the article the first time, use a highlighter to identify the words you do not understand. Write the words in this section and then find out and write down what they mean.

_____

_____

_____

_____

_____

_____

_____

Tuesday- Introduction. What is the article about and how did the author try to get you interested in it in the introduction?

_____

_____

_____

_____

_____

Wednesday- Outline. Use a different color highlighter to identify the parts of the article that you think are the most important things to know about. Write down why you think those things are important in the space below. Underline new vocabulary words you use.

Thursday- Summary outline. The following guiding questions will help you think about what to write. On Friday you will write a complete summary and response about what you read.

What was the article about?

Why is it important to know the information that is in the article?

Are there connections in the article that you can make to things you already know about?

What is your opinion of the article?

Do you think that the place the news article came from is one you can trust to be accurate?

Why did you answer the question about the news source the way you did?

Friday- Summary. On the back of this paper, or on a typed separate piece of paper, put all of your summary responses together in one piece of writing.

Name (first and last)_____Date_____Block _____

Title of article _____

Structured Weekly Reading Project for Introductory Science Courses

Reading science news is a skill that improves when you do it more often and in a structured manner. In this course you will read provided articles on a regular basis and analyze what you read and also how you read it. The following format will provide the general framework for your weekly reading analysis that breaks the task down into smaller assignments. I will also provide you with other details and methods to assist you in building your reading strengths as the course progresses.

The first step is to read the article and highlight the vocabulary that is new to you or somewhat unfamiliar. This process is not a competition to see who knows the most words but a way for you to identify terms you personally need to define. Transfer your personal vocabulary learning list to this page in the space below, and define what the words mean. You should work on this yourself as much as you can but ask for help from someone in your Supported Study block or a science teacher if you need to.

MONDAY- Vocabulary

_____

_____

_____

_____

_____

_____

_____

_____

A good writer tries to create interest for the reader in the first paragraph by introducing the topic in an interesting way. What is the topic of the article and how did the writer try to get the readers interest? Was the writer successful in getting your interest? Why or why not?

MONDAY- Introduction

_____

_____

_____

_____

_____

TUESDAY- Outline

Now use a different color highlighter and select the parts of the article that you think are important to properly understand what the writer is trying to present to the reader. In the next section of this form, outline the important parts of the article. Use your own words as much as possible, and underline any new vocabulary words you use in your outline.

_____

_____

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_____

WEDNESDAY- What are concepts in the article that you don't understand? Use complete sentences.

_____

_____

_____

_____

_____

WEDNESDAY- What are some interesting things you read about? Use complete sentences.

_____

_____

_____

_____

_____

THURSDAY-

We will have a discussion or debate at the end of the week about the article and you will need to provide input to those sessions. If the article we read has two sides to it you should create a pro and con list so you will be prepared for either side of the debate to which you are assigned. If the article is not to be debated but is to be discussed, you will need to have a list of important facts and concepts drawn from the article and your outline.

Pros and cons, <u>or</u> important facts and concepts list.

_____

_____

_____

_____

_____

_____

_____

_____

_____

FRIDAY- During or after the discussion or debate, write down anything else you feel is important.

_____

_____

_____

Friday homework, due Monday-After the process of reading, analyzing and discussing the article, you should be able to write a personal reaction to what you have read. What do you think is the importance of the article? How does it relate to you or your personal experiences? Are there any connections that you can make to other things that you know about? Are there other things that come to mind that you may want to know about after having read the article? The rest of this section is on the back of this page. Your writing should reflect effort, and be correct in regards to clarity of thought, proper writing structure and spelling.

What is the importance of the article?

_____

_____

_____

_____

Category	4	3	2	1

What is your opinion about the topic?

What connections to your prior knowledge can you make?

What else might be important to think about that is related to the topic?

Preparedness	Student is completely prepared for the presentation and is rehearsed.	Student is pretty prepared but should have rehearsed more.	The student is somewhat prepared but clearly did not rehearse.	Student does not seem prepared to present.
Enthusiasm	Facial expressions and body language generate a strong interest and enthusiasm about the topic in others.	Facial expressions and body language sometimes generate a strong interest about the topic in others.	Facial expressions and body language are used to try and generate a strong interest but seem artificial.	Very little use of facial expressions or body language. Did not generate interest in topic being presented.
Speaks clearly	Speaks clearly and distinctly over 95 % of the time and mispronounces no words.	Speaks clearly and distinctly over 95 % of the time but mispronounces a few words.	Speaks clearly and distinctly 94 - 85 % of the time and mispronounces several words.	Often mumbles or cannot be understood or mispronounces a lot of words.
Posture and Eye Contact	Stands up straight, looks relaxed and confident. Establishes eye contact with entire audience.	Stands up straight, Establishes eye contact with entire audience.	Sometimes stands up straight and establishes some eye contact with the audience.	Slouches and/or does not look at people during the presentation.
Content	Shows full understanding of the topic.	Shows a good understanding of the topic.	Shows a good understanding of parts of the topic.	Does not seem to understand the topic very well.
Volume	Volume is loud enough to be heard by all audience members throughout the presentation.	Volume is loud enough to be heard by all audience members at least 90% of the time.	Volume is loud enough to be heard by all audience members at least 80% of the time.	Volume is often too soft to be heard by all audience members.
Confidence in the news source	Presenter defends his/her confidence in the news source well with specific and solid reasoning.	Presenter defends his/her confidence in the news source reasonably well with solid reasoning.	Presenter defends his/her confidence in the news source reasonably well but with only general reasoning.	Presenter does not defend his/her confidence in the news source with any specific or solid reasoning.

Oral Presentation Rubric: Science News Journalism Presentation

News Literacy Model Curriculum in Science Grades 9-12

Lesson 8: Decommissioning Nuclear Power Plants

Lesson 8

Decommissioning Nuclear Power Plants

This lesson allows students to explore the ethical, political, and environmental issues surrounding the decommissioning of nuclear power plants. They will use news media to inform their position before presenting their own recommendations for decommissioning a plant.

Grade Level: 9-10
Estimated Time: Four-five class periods

Learning Objectives
Students will:

- Analyze ways of decommissioning nuclear plants and determine which plants are similar to Vermont Yankee, based on research.
- Create a 21st century formal presentation.
- Analyze the options presented by each group to the class and devise on their own which way of decommissioning would best fit Vermont Yankee.
- Differentiate between biased and nonbiased sources.

Guiding News Literacy Question: What challenges and opportunities do the Internet and digital media create?
Information overload is a major drawback in today's world, especially when it comes to learning about issues steeped in ethical or political controversy. By evaluating a variety of information and then presenting their own conclusions, students learn to be empowered by media instead of overwhelmed.

Common Core State Standards

RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
RST.11-12.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
WHST.9-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

WHST.9-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
WHST.11-12.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
WHST.9-12.9	Draw evidence from informational texts to support analysis, reflection, and research.

Next Generation Science Standards

Performance Examples	Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.
Structure and Properties of Matter	• Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons. (HS-PS1-1) • The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states. (HS-PS1-1) • The structure and interactions of matter at the bulk scale are determined by electrical forces within and between atoms. (HS-PS1-3),*(secondary to HS-PS2-6)*
Nuclear Processes	Nuclear processes, including fusion, fission, and radioactive decays of unstable nuclei, involve release or absorption of energy. The total number of neutrons plus protons does not change in any nuclear process. (HS-PS1-8)

Cross-cutting Concepts	**Patterns** • Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena. (HS-PS1-1),(HS-PS1-3) **Energy and Matter** • In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved. (HS-PS1-8) **Structure and Function** • Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem. (HS-PS2-6)

Materials
Student Handout
Projector and computer with Internet access for teacher
Laptops with Internet access for each group, preferably two students per group.
PowerPoint presentation: *Know Your News*
PowerPoint presentation: Nuclear Plant Entombment
Chernobyl documentary: *Zero Hour: Disaster at Chernobyl Discovery Channel (2004)* available on YouTube: https://www.youtube.com/watch?v=ITEXGdht3y8

Prior Knowledge
This activity is best suited after completing a Nuclear Reaction/Isotopes Unit, as a way to involve students in critical thinking and decision making processes. It is recommended students have the following prior knowledge:

Students should be able to define and differentiate the three types of radiation; calculate half-life for radioactive isotopes and understand that half-life is a measure of time; and write transmutation reactions when one isotope changes into another by emanating one type of radioactive radiation.

Key Concepts
Isotopes
Half Lives
Transmutation/Element Changing
Radiation Types – alpha, beta, gamma radiations.

Instructional Plan

Day 1: Introducing the project
Give each student a copy of Student Handout. Explain to students what this project is about, following the directions from the handout. Explain or give details and ask questions to check for understanding. Assign or let students determine their partner and the research topic. Keep the copy with names/research topic and make sure each student knows the research topic.

Read the prompt to the class: The VT Yankee nuclear power plant is being decommissioned. There are many ways to clean up a former nuclear power site, including Entombment, Safestor, and Decon.

Clearly specify what type of assessment is expected for this project. Explain that each group needs to prepare:

An oral discussion/explanation
A 21st Century visual (digital poster/PowerPoint presentation/etc.)
A list of sources

Building background
Explain that there are pros and cons to each type of clean up. Ask students what considerations exist when cleaning up a power plant. Respond to answers, but be sure students hit on:

- soil quality
- spent fuel rod removal
- spent fuel rod storage
- watershed protection

Documentary
Watch as a class the documentary called "Zero Hour." While watching, ask students to determine the cause(s) of the nuclear disaster. If there is not enough time, continue the documentary next class.

For homework, ask students to write a short paragraph regarding the causes and effects of the Chernobyl disaster. They will share their responses next class.

Day 2: Research and knowing your news
Ask students to share their opinion about the causes and effects of Chernobyl. You can review the Nuclear Plant Entombment PowerPoint if needed.

Present to the class the PowerPoint called "Know Your News," emphasizing the role of media and the importance of selecting accurate sources to conduct a non-biased report.

Allow students to research their topic using laptops or other mobile devices.

Walk around and assist the students with questions. Make sure each student uses the Internet only for research. Ask students, "Is this a bias or unbiased source? How do you know?"

Instruct students to finish all research for homework.

Day 3: Project completion
Provide students with laptops, and ask students to start creating their visual presentation. Guide students to share the PowerPoint with his/her partner, so both can add and edit.

When done, they should share it with the teacher. This is also their homework if it's not finished in class. Remind students that the presentation is due next class.

Day 4: Presentations
Have students decide the order of presentations, and allow them to take ownership. Ask students to pay attention and take notes so they can complete the second part of the assessment— a constructed response paper due next class.

After hearing all presentations: Remind students that each student will write a one-page constructed response about the best way to decommission the VT Yankee nuclear power plant using information from the other groups' presentations.

Assessment
Use the rubric provided to grade each presentation. The skills assessed are:

Research Skills (1)
- At least three sources cited
- Some sources cited are non-biased
- Biased sources are balanced by other biased sources (both sides)
- One source is a government agency or educational institution

Sharing Product, Digital (Technology) (2)
- Selects appropriate information to share
- Information is explained in students' words, not copy-pasted (quotes ok)
- Information is in a digital format that is accessible and understandable to viewers
- Examples: Science fair poster, student-made YouTube video, PowerPoint, Prezi, audio podcast, screencast.
- Answers follow-up questions with knowledge in the topic

Problem Solving (3):
- Individual Constructed Response Scoring Guide – one written page due the day after all visual presentations were shared in class

- Student chooses a side and explains it
- Student backs up his/her opinion with information from each aspect of decommission
- Two or more supporting pieces of evidence are given

Materials: Decommissioning Nuclear Power Plants

1. Student Handout
2. Presentation Rubric
3. Student Examples of Constructed Responses

Nuclear Plant Decommissioning
Student Handout

Group Names_____
Research Topic Assigned _____

Scenario: The VT Yankee nuclear power plant is being decommissioned. You are a reporter for WCAX News and have only five minutes to inform people about decommissioning a power plant.

You will work in groups of two students. Your group partner is your daily lab partner. There are many ways to clean up a former nuclear power site, including Entombment, Safestor, and Decon.

You will research in a small group one of the above options or aspects of nuclear plant decommissioning. Your teacher will assign the topics to each group. Your group will be reporting out to the class to educate your classmates on that aspect.

There are pros and cons to each type of clean up. Things that need to be considered are:

- soil quality
- spent fuel rod removal
- spent fuel rod storage
- watershed protection

Assessment/Grading

Each Group Needs to Prepare:

- A 21st Century visual (digital poster/PowerPoint presentation/etc.)
- An oral discussion/explanation of 5 minutes per group. Expect questions from the teacher and other students in the class.

The scoring rubric below reflects this assessment's guidelines:
1. Research Skills
2. Sharing Product, Digital (Technology)

Individual work:

- After hearing all presentations, write a one page constructed response arguing for the best way to decommission the VT Yankee nuclear power plant and using information from the other groups' presentations.

The scoring rubric below reflects this assessment's guidelines:
3. Individual constructed response.

Checklist – Group Presentation

Make sure you include the following grading criteria for each category assessed:

1. **Research Skills**
   - At least three sources cited
   - Some sources cited are non-biased
   - Biased sources are balanced by other biased sources (both sides)
   - One is a government agency or educational institution.

2. **Sharing Product, Digital (Technology)**
   - Selects appropriate information to share
   - Information is explained in students' words, not copy-pasted (quotes ok)
   - Information is in a digital format that is accessible and understandable to viewers

   Examples: Science fair poster, student-made YouTube video, PowerPoint, Prezi, audio podcast, screencast.
   - Answers follow-up questions with knowledge on the topic.

3. **Individual constructed response**
   - Individual Constructed Response Scoring Guide – one written page due the day after all visual presentations were shared in class about the best way to decommission the VT Yankee nuclear power plant using information from the other groups' presentations
   - Student chooses a side and explains it
   - Student backs up his/her opinion with information from each aspect of decommission
   - Two or more supporting pieces of evidence are given

Presentation and Constructed Response Rubric

	1	2	3	4
Research(1)	I can gather information about a topic and sort it relative to its relevance to a specific claim or question.	I can extract significant details from an information source or a body of evidence to apply to a claim or question.	I can sort and evaluate multiple information sources or bodies of evidence relative to their usefulness, authority, and bias relative to a challenging topic or controversy.	I can use research to form new questions and generate my own insights while investigating a topic, and present the multiple dimensions of a complex topic or controversy.
Technology(2)	I can select digital tools and applications, including online, to use for real-world tasks and justify the selection based on efficiency and effectiveness.	I can recognize a variety of file types and utilize appropriate applications to open, convert, optimize, transfer, and work with files.	I can communicate information and ideas effectively to multiple audiences using a variety of media and formats.	I can interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
Problem Solving(3)	I can identify a problem to be solved and make an attempt to do so, but I have trouble finding the correct procedure.	I can select an appropriate procedure, but I have difficulty following it to arrive at a correct solution.	I can select and implement relevant procedures or strategies needed to solve real world problems. My reasoning/modeling demonstrates some evidence.	I can select and implement relevant procedures or strategies needed to solve real world problems while considering any constraints. My reasoning/modeling demonstrates appropriate evidence.
Individual constructed response (after hearing all presentations)	I can identify a problem to be solved and make an attempt to do so, but I have trouble finding the correct procedure.	I can select an appropriate procedure, but I have difficulty following it to arrive at a correct solution.	I can select and implement relevant procedures or strategies needed to solve real world problems. My reasoning/modeling demonstrates some evidence.	I can select and implement relevant procedures or strategies needed to solve real world problems while considering any constraints. My reasoning/modeling demonstrates appropriate evidence.

Examples of Constructed Responses

Student 1.

There are three ways of decommissioning a nuclear power plant: Decon, Safestor, and Entombment. Safestor stands for safe storage, which is where the power plant is safely stored and maintained until radioactivity decays to a safe level. Decon stands for decontamination, which is where the power plant is taken apart piece by piece, and is cleaned of radioactivity. Entombment is where the whole power plant is buried. The best way to decommission a power plant is to use Safestor, and then Decon.

Safestor is the safest and most reliable way to decommission a power plant. One way safestor is the safest is that it is placed in a safe storage configuration until dismantling, which can be done safely as there is a high reduction of radioactivity. Also, all spent fuel is stored on site. The spent fuel is monitored and secured so as to keep it from becoming even more of a hazard. This way of decommissioning is also the most reliable because the site is under safe storage for up to 60 years before being dismantled. Often times, after 50 years of safe storage, a power plant will go into Decon which allows for the plant to be immediately dismantled. Each piece of the plant is taken down and further cleansed of radioactivity. Decon leaves very little waste and makes almost all parts able to be reused. Another pro to using Safestor and Decon is that it protects the environment by keeping radioactivity out of the watershed.

On the other hand, there are some cons to using Safestor and Decon. This way of decommissioning a power plant can be quite expensive, up to one billion dollars. Also, Safestor takes a long time: up to 60 years. Another con to using this decommissioning process is that it is not for emergencies. In the case of emergency, entombment would be the best option. Overall, Safestor and Decon are the best way of decommissioning a nuclear power plant.

Student 2.

Nuclear power is very popular and useful energy source for humanity. In 2006, Vermont's energy use was made up of 75.1% of nuclear energy. We use the most nuclear energy in the country. With all of this power being used, people often ask about the benefits and dangers of nuclear power, how much it costs, and what is required of workers.

First, nuclear power has a variety of benefits and dangers. For example, nuclear power produces no smoke, which means no CO2 emissions which makes it a cleaner energy source than fossil fuels, although it leaves behind significant amounts of radioactive material behind that is not biodegradable and remains radioactive for thousands of years. Furthermore, it is said that nuclear power is

safer than coal burning plants, despite the numerous past events that involved radioactive material leaking out of power plants and even explosions.

Another big question about nuclear power is "how much does it cost?" The average cost of nuclear energy is $1.82 per kWh, while coal energy costs $2.13 per kWh, and natural gas is $3.69 per kWh.

Also, humans play a big part in making nuclear power usable. It is estimated that on average a power plant will hire around 400 employees. Almost all of the positions require proper training and education before they are hired, and there are also tight safety protocols.

Finally, it is my belief that nuclear power can be a great thing, but it can also be deadly. If there was a way to create nuclear power without the radioactive waste, than it would be the ideal energy source, but until then, there are too many risks of exposure and pollution in today's world.

Student 3.

The Vermont Yankee Nuclear Power Plant should be decommissioned with the safety of the surrounding people and environment in mind. Therefore, I believe that Safestor is the safest way to decommission the plant. Safestor is a method of decommissioning by removing the fuel rods and storing them in on site locations, while the remaining building and materials are enclosed in thick, radioactive resistance materials for fifty or more years. This allows for the radioactive material in the plant to decay, making it safer to the workers and the surrounding environment. After the allotted time has passed, workers begin to clean and recycle the building and materials. This is a much safer decommissioning technique because it poses less threat to the workers who clean the inside materials, and it also poses less of risk to the environment, which is especially important for Vermont Yankee because it is on a water front.

Furthermore, out of the 26 decommissioned or decommissioning power plants in the United States, Safestor has been used for at least eleven of them. This shows how it is a popular choice because of its safety. However, one downside of Safestor is that it is the most expensive method. Payment goes to maintaining the spent fuel rods, enclosing the building, the disassembly of the building, and constant security of the area. This makes it the most expensive method, but what is most important is that is the safest. The environment is a large part of the Vermont culture, from hunting, to skiing, to tourists looking at fall leaves, we must protect it in any way possible, so Safestor is the best option, because it protects one of Vermont's most valuable resources.

Helpful News Literacy Resources

The following resources have been culled from an extensive database of news literacy projects. They provide useful starting points for the novice news literacy teacher and offer ideas for curriculum extensions and classroom activities. They have been broken down into topical categories for easier reference.

Understanding News Literacy

1. Harvard University --- Berkman Center for Internet & Society

- *The Challenges of Defining 'News Literacy*

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2342313

- *Mapping Approaches to News Literacy Curriculum Development: A Navigation Aid http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2354500*

- Youth and Media Project http://youthandmedia.org/teaching-and-outreach/curricular-modules/information-quality-news-literacy-modules/

2. The News Literacy Project CHECK Infographic:
http://thenewsliteracyproject.org/sites/default/files/Check Infographic Lesson.pdf

3. Journalism Education Association's Unit on Understanding News Literacy
http://jea.org/blog/2013/07/24/lesson-plan-understanding-news-literacy/

4. Stonybrook Center for News Literacy
http://digitalresource.center/

5. Pulitzer Center on Crisis Reporting
http://pulitzercenter.org/education

Whether you are looking to globalize your class, make connections to the local community, align your curriculum with Common Core standards, or bring your units alive with journalists fresh from the field, we want to work with you.

6. American Society of News Editors' Youth Journalism Initiative
http://www.schooljournalism.org/news-media-literacy/

Why News Matters and How News is Changing

1. The News Literacy Project's video on why local news matters

http://www.thenewsliteracyproject.org/learn-channel/watchdog-journalism-local-news

The News Literacy Project offers a free video (6:39) in which Elis Estrada, an associate producer for the consumer investigative unit at NY1 News,

discusses the watchdog role journalists can play in their communities and how a local news story influenced change. Key teaching points: gather information from numerous sources, attempt to get all sides of the story and then present facts to the public, raise awareness about the issue, bring the issue to the attention of the government agency in charge.

2. The News Literacy Project's video on Tweeting Hurricane Sandy
http://www.thenewsliteracyproject.org/learn-channel/tweeting-hurricane-sandy-deception-and-knowing-what-believe
The News Literacy Project offers this free video lesson, (15:15). Maggie Farley, a former Los Angeles Times reporter, uses misinformation about Hurricane Sandy that spread via Twitter to discuss how to judge the credibility of tweets, including an example of tweets that falsely claimed the New York Stock Exchange was flooded potentially impacting world markets.

3. The News Literacy Project's video on social media during the Boston Marathon
http://www.thenewsliteracyproject.org/learn-channel/social-media-during-boston-marathon-bombing
The News Literacy Project offers a free video (8:36). Nicco Mele, a lecturer at Harvard University's John F. Kennedy School of Government, discusses the benefits and pitfalls of social media during the Boston Marathon bombing and challenges students to figure out the answers to important questions about responsible use of social media including: How do you know what to believe? What opportunities does the internet create? What are the disadvantages?

4. PBS's definition for "What's News"
http://www.pbs.org/wgbh/pages/frontline/newswar/view/16.html?c=2qt

5. The News Literacy Project's photo fact checking lesson
http://www.thenewsliteracyproject.org/learn-channel/photo-fact-checking-digital-age

Free video (6:31) includes a frog photobombing a photo taken of a NASA and other engaging examples. Explains why digital photos posted on social media and elsewhere online need to be checked, and shares easy-to-use tips and tools for verifying them.

Bias and Reliability

1. The News Literacy Project's Consumer's Guide to Sourcing in News Reports
http://www.thenewsliteracyproject.org/learn-channel/sourcing

2. The News Literacy Project's Saltzman Seven Guide
http://thenewsliteracyproject.org/lesson-consumers-guide-sourcing-news-reports

The News Literacy Project offers this free video lesson (8:57). Paul Saltzman, assistant managing editor for projects at the Chicago Sun-Times, discusses sourcing in news reports and offers helpful guidance for evaluating a report's credibility. He offers 7 keys to evaluate the sourcing including: the number of sources, transparency of sourcing, authority, variety of sources, motives, anonymous sources and documents.

Additional News Literacy Resources for Science Teachers

The following resources may be helpful as supplementary or complementary content as you seek to develop a news literacy focus in your English/Language Arts classroom.

1. The New York Times Learning Network for Language Arts
   http://learning.blogs.nytimes.com/category/science/

2. The News Literacy Project's video on Tweeting Hurricane Sandy
   http://www.thenewsliteracyproject.org/learn-channel/tweeting-hurricane-sandy-deception-and-knowing-what-believe
   The News Literacy Project offers this free video lesson (15:15) in which Maggie Farley, a former Los Angeles Times reporter, uses misinformation about Hurricane Sandy that spread via Twitter to discuss how to judge the credibility of tweets, including an example of tweets that falsely claimed the New York Stock Exchange was flooded potentially impacting world markets.

Credits

Grades 7/8 Lessons
Really?! I'm eating WHAT?!—Danielle Dorsey
Exploring Silica-sand Mining—Anna Karsten
Evolution WebQuest—Deborah Kravchuk

Grades 8/9/10 Lessons
Static Electricity and Cell Phones Myth—Michele Brustolon
Fact or Hype: Ebola in the News—Danielle Dorsey
Water in the United States—Erin Gannon
Weekly Earth Science Reading—Mark Powers

Grades 11/12 Lesson
Decommissioning Nuclear Power Plants—Dana Dezotell