Discipline-Specific Literacy

Module 3

Secondary Science

Desired Outcomes

- Become familiar with the Common Core State Standards (CCSS) for literacy in science and how they are organized
- Provide a rationale as to why teachers need to address the CCSS for literacy in science
- Describe some ways that teachers can address the CCSS for literacy in science

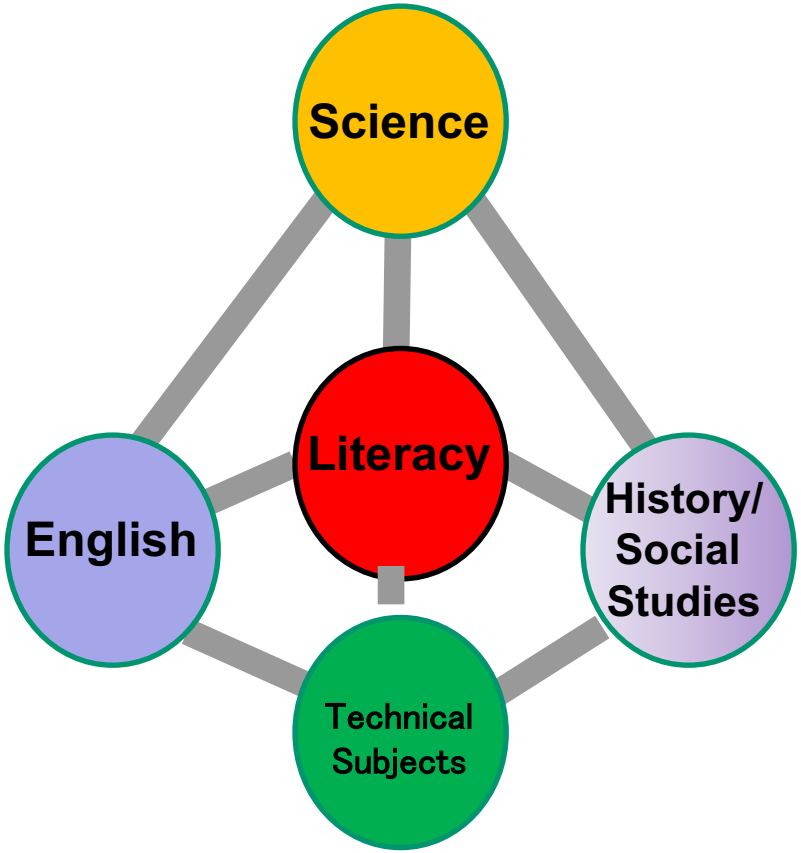
Literacy Defined

Literacy is the ability to understand and use language and images to acquire knowledge, communicate and think critically in all content and contexts.

***Literacy for Learning*, Hawaii State Dept. of Education, April 2009**

Key Design Considerations for Common Core Standards

- An integrated model of literacy
- Research and media skills blended into the standards as a whole
- Shared responsibility for students' literacy development



Why Literacy in Science?

College and Career Ready

- Gap between college and high school texts about 4 grade levels
- 8th grade texts = former 5th grade texts
- 12th grade texts = former 7th grade texts (compared to 40 years ago)

Susan Pimental's "Transitioning to the Common Core State Standards" 7/28/11 Presentation at OCISS

Academic Literacy Video

- Literacy in Other Disciplines

Science + Literacy

Do you use any of these?

- Science Talks/Discussions
- Science Notebooks
- Reading Expository Text
- Formal Scientific Reports
- Journal

Why Science Literacy Standards?

Scientific texts pose specialized challenges to inexperienced and struggling readers.

--Reading in the Disciplines: The Challenges of Adolescent Literacy, Carol D. Lee and Anika Spratley

Teaching Features

Text Features	
Literary	Informational
•Title •Chapter Index (for Chapter Books) •Illustrations •Bold Print •Continuous Text •Paragraphing •Dialogue	•Title •Table of Contents •Index* •Photos •Captions •Diagrams •Glossary •Date Line (periodicals) •Bold Print •Headings •Sub-titles

*The more readers build up knowledge about these elements and underlying structures, the better they can use them as sources of information.

Teaching Structures

Structure (Organization)	
Literary	Informational
Story Elements: •Characters •Setting •Problem/Solution •Plot	•Cause and Effect •Sequence •Problem/Solution •Description •Compare and Contrast

Scientific Texts include:

- Abstracts
- Section Headings
- Figures
- Tables
- Diagrams
- Maps
- Drawings
- Photographs
- Reference Lists
- Endnotes

Question: How can we support our students?

Answer: Discipline Specific Literacy

- More sophisticated and specific kinds of literacy support is necessary
- Requires a particular type of reading

- --Reading in the Disciplines: The Challenges of Adolescent Literacy, Carol D. Lee and Anika Spratley

How do the following work together to support readers?

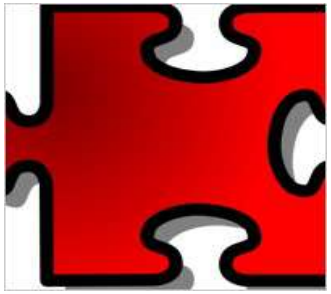
- Standards
- Teacher Instruction
- Assessments

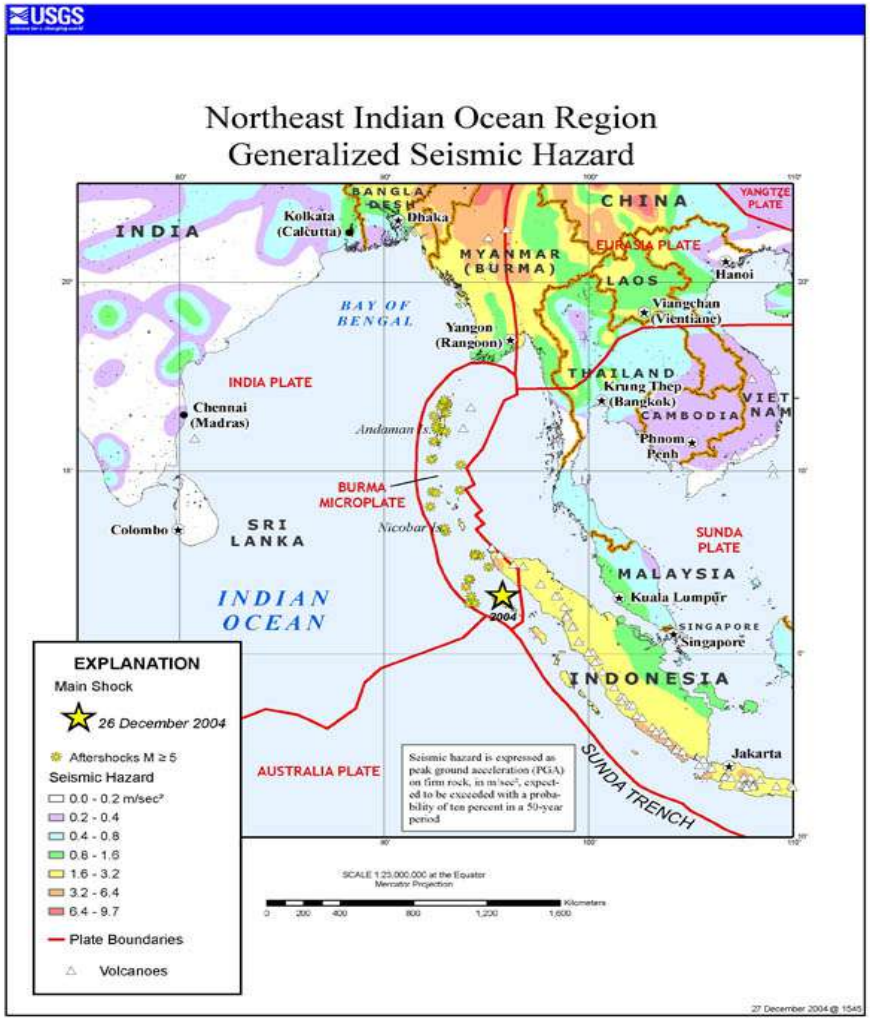
Standards:

Activity- match the ELA anchor standard with the Literacy in science standards

6-8 Instruction:

Article





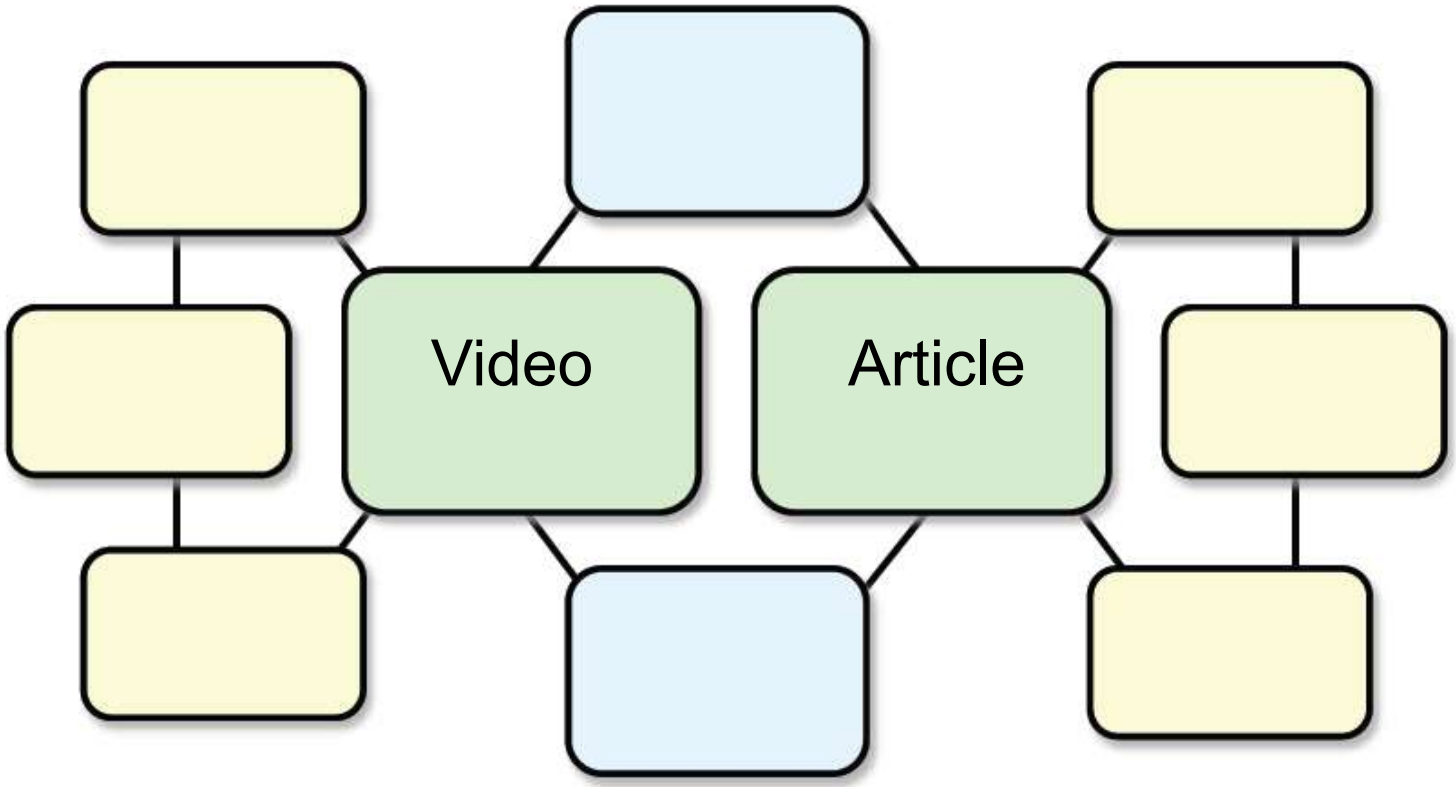
Standard 9, Grades 6 - 8

- Compare and contrast the information gained from experiments, simulations, videos, or multimedia sources with that gained from reading a text on the same topic.

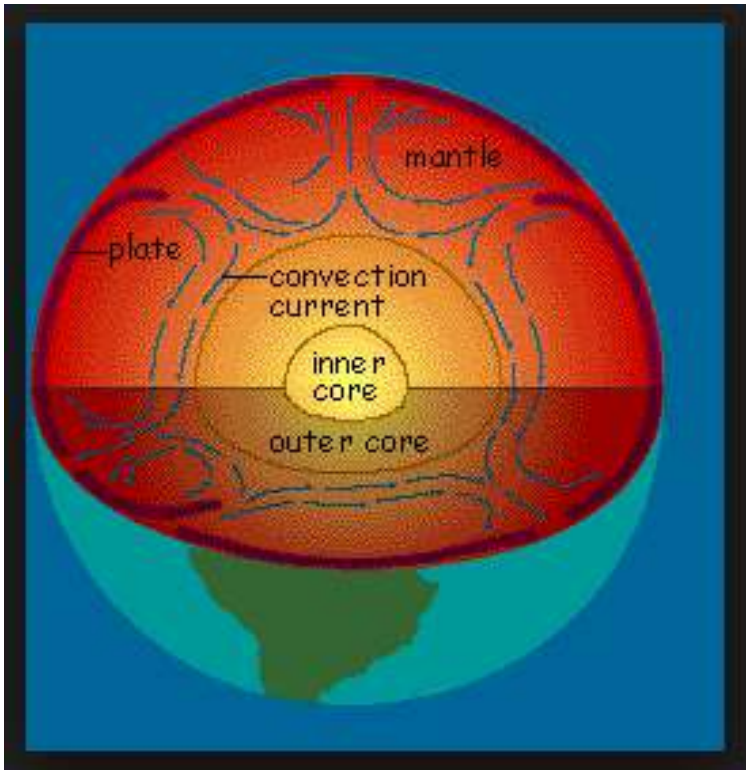
Standard 9, Grades 6 - 8

- The Task:
- Watch a video about the earth's crust and tectonic plates, then read the article "Earth's Big Breakup".
  - Compare and contrast the amount and type of information conveyed by each source.
  - Explain how each helps to develop understanding of plate tectonics.

Double Bubble Organizer



Video



Standard 2, Grades 9 - 10

- Determine the central ideas or conclusions of a text; trace the text explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

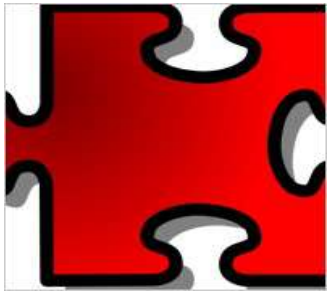
Standard 2, Grades 9 - 10

The Task:

- Provide an accurate summary of the article, “Earth’s big breakup.” Article

The Process:

- Read the article, complete the graphic organizer to write an accurate summary



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Example Anchor Chart

Using the Reporter's Formula to Summarize Informational Texts

Who/What is most important?	***What*** *is most important about them?*	**Where** Did this occur?	**When** Did this occur?	***Why*** *Is the subject important?*	**How** Did this occur?

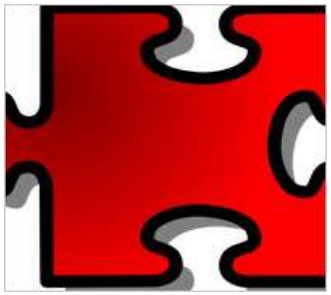
Our Summary:

Reading Standards for Literacy in Science and Technical Subjects

Grades 6-8	Grades 9-10	Grades 11-12
2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	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.	2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Standard 6, Grades 11 - 12

- Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved



Standard 6, Grades 11 - 12

The Task:

- To analyze the Author's Purpose in providing an explanation and to identify important issues that remain unresolved.

The Process

- Read the article, "Intraplate Quakes Signal Tectonic Breakup" Article .
- Complete graphic organizer on Author's Purpose

Delaware Department of Education

Author's Purpose Chart

What is the Author's Purpose---	What makes you think that?
in providing the first map for the reader?	
in providing the example of the motorcycle with the side car in paragraph 7?	

Analyze the author's purpose in providing these explanations.

_____

_____

_____

_____

What important issue may remain unresolved?

_____

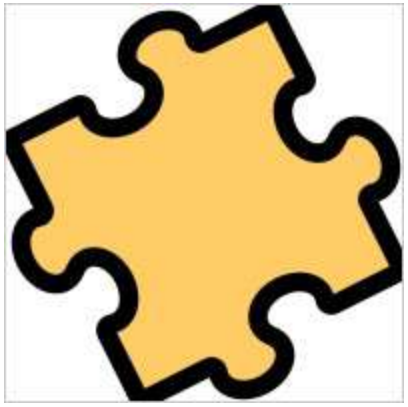
_____

_____

_____

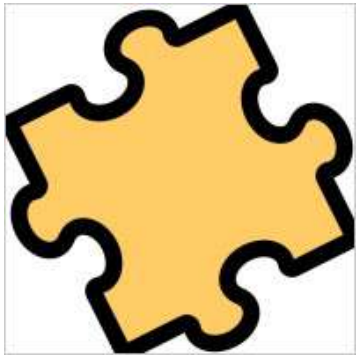
Assessment Examples

- Students *analyze* the concept of mass based on their close reading of Gordon Kane's "The Mysteries of Mass" and *cite specific textual evidence* from the *text* to answer the question of why elementary particles have mass at all. Students explain *important distinctions the author makes* regarding the Higgs Field and the Higgs Boson and their relationship to the concept of mass. [RST.11–12.1]



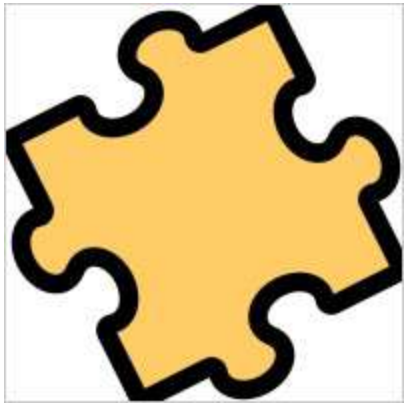
SBAC Performance Task (Link)

- Write an argumentative report that recommends the position that your congresswoman should take on the plan to build a nuclear power plant in your state. Support your claim with evidence from the Internet sources you have read and viewed. You do not need to use all the sources, only the ones that most effectively and credibly support your position and your consideration of the opposing point of view.



Grade 8 Sample- NYCDOE

- Write an argumentative essay in which you introduce a claim arguing for or against the United States investing money on renewable energy resources. Your essay should consider how the choice between investing in either renewable energy or non-renewable energy resources will affect both the environment and the economy. Depending on whether or not you think the United States should continue investing money in renewable resources, acknowledge and distinguish the opposing claim, and organize the reasons and evidence logically. Support your claim with clear reasons and cite relevant textual evidence from at least three articles read or discussed during this unit. Include domain-specific vocabulary and maintain a formal style.



Literacy Design Collaborative (LDC)

- The Literacy Design Collaborative [LDC] offers a fresh approach to incorporating literacy into middle and high school content areas. Designed to make literacy instruction the foundation of the core subjects, LDC allows teachers to build content on top of a coherent approach to literacy.

	ARGUMENTATION	INFORMATIONAL OR EXPLANATORY
Definition		ELA, science, social studies
Description		ELA, science, social studies
Procedural-Sequential		science, social studies
Synthesis		ELA, science, social studies
Analysis	ELA, science, social studies	ELA, science, social studies
Comparison	ELA, science, social studies	ELA, science, social studies
Evaluation	ELA, science, social studies	
Problem-Solution	science, social studies	
Cause-Effect	science, social studies	science, social studies

http://www.literacydesigncollaborative.org/

Desired Outcomes

- Become familiar with the Common Core State Standards (CCSS) for literacy in science and how they are organized
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- Describe some ways that teachers can address the CCSS for literacy in science

Redefining Inquiry in Science

Being science literate entails being able to read and understand a variety of science texts to form valid conclusions and participate in meaningful conversations [discussion] about science.

In Zmach et al., 2006-2007, p. 62

List of References- Links Embedded

- Literacy for Social Studies/History, Science and Technical Subjects Standards
- Literacy Design Collaborative
- *Literacy for Learning*, Hawaii State Dept. of Education, April 2009
- Susan Pimental's "Transitioning to the Common Core State Standards" 7/28/11 Presentation at OCISS
- The Hunt Institute
- The NY Dept. of Education Reading in the Disciplines: The Challenges of Adolescent Literacy, Carol D. Lee and Anika Spratley
- Science News for Kids
- Fresno Dept. of Education
- You Tube
- Austin Schools

Module Extensions

- Ways to identify literacy demands of the content area
- Evidence of the Shifts in Practice
- List of discipline-specific genres (what do scientists read…)
- List of anchor texts (examples of the above)
- Examples of reading like, “a historian”, “scientist”, “mathematician”, etc.
- Using discipline-specific text as models for writing
- Research that supports literacy in this discipline
- Examples of some of the literacy standards