



Content Literacy Tied to the New Standards

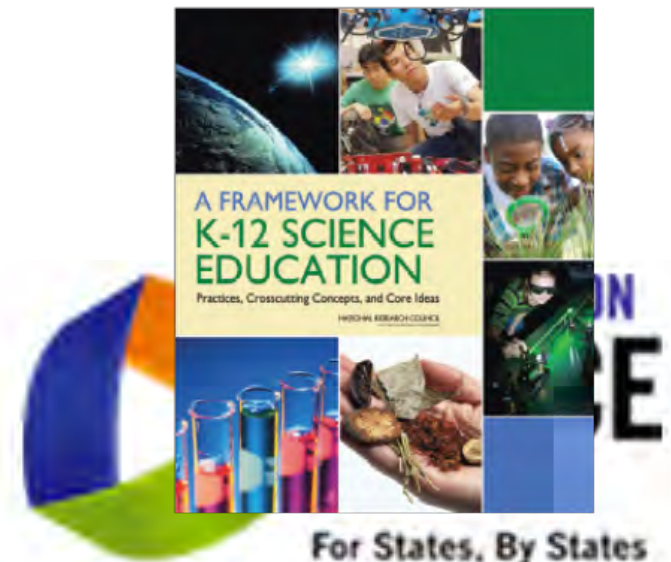


Tom Peters, Ed.D.
SC Coalition for Mathematics & Science

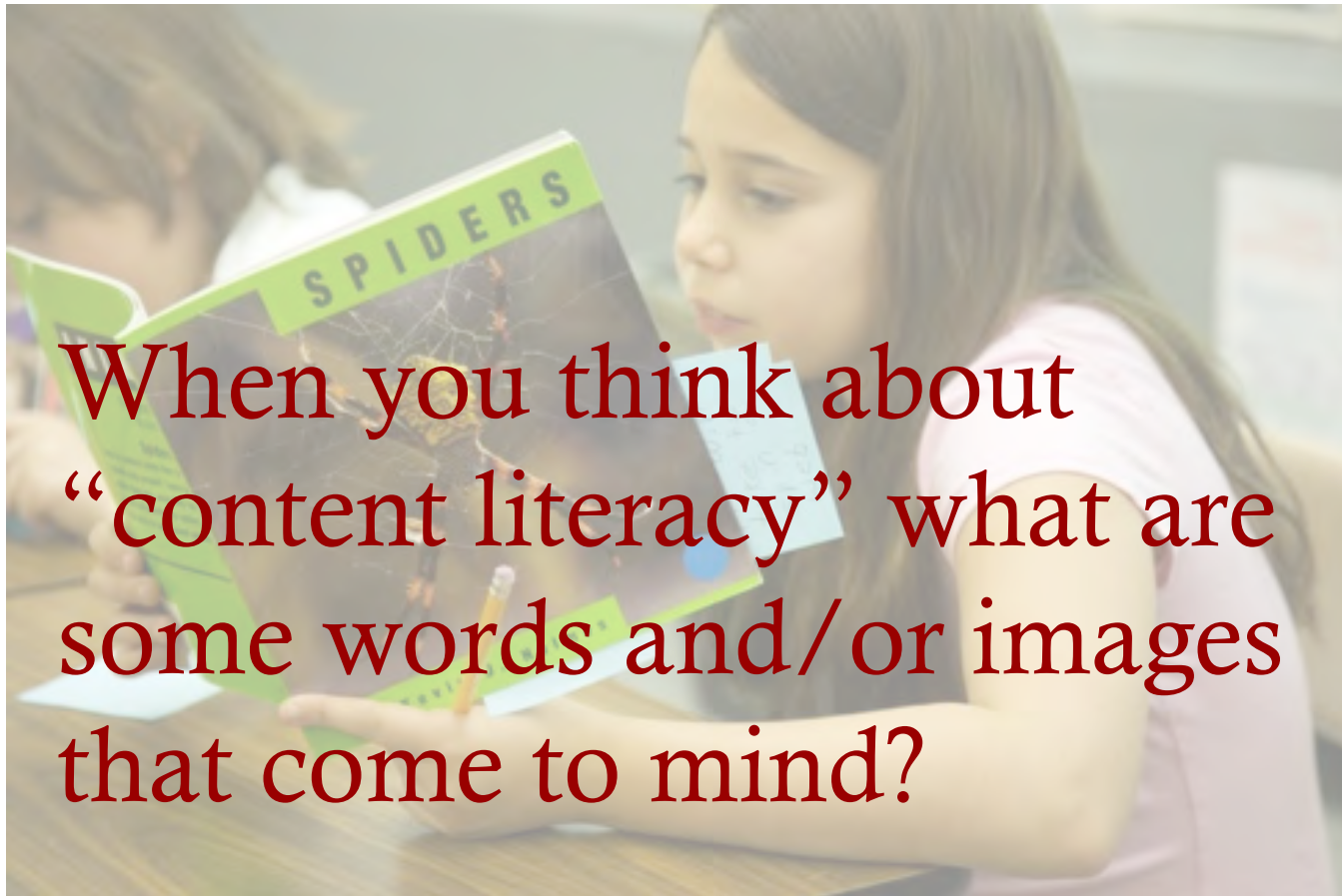
Leigh Haltiwanger, Ed.M.
Clemson University

Goal

- Understand specific aspects of content literacy as they relate to the Common Core State Standards for Mathematics and the Next Generation Science Standards*.



Content Literacy



When you think about “content literacy” what are some words and/or images that come to mind?

What is Content Literacy?

the ability to use **reading and writing** for the **acquisition of new content** in a given **discipline**...McKenna, Michael C. & Robinson, Richard D., **1990**

the ability to **negotiate** (e.g. read, view, listen, taste, smell, critique) and **create** (e.g. write, produce, sing, act, speak) texts **in discipline-appropriate ways** or in ways that other members of a discipline would recognize as “correct” or “viable”. **2010** Draper, et. al.

What is Content Literacy?

The United Nations Educational, Scientific and Cultural Organization (UNESCO), **2004**, defines literacy as:

"ability to **identify, understand, interpret, create, communicate and compute**, using **printed and written materials** associated with varying contexts."

"Literacy involves a continuum of learning in enabling individuals to...**participate fully in their community and wider society.**"

What is Content Literacy?

- **acquisition of new content**
- **create**
- **participate fully in their community and wider society**

Content Literacy in the Common Core State Standards for Mathematics

“One hallmark of mathematical understanding is the ability to justify, in a way appropriate to the student’s mathematical maturity, why a particular mathematical statement is true....” (p. 4)

“[Students] can analyze relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.” (p. 7)

“Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.” (CCSS MP.3)

Content Literacy in the next generation of standards for Science

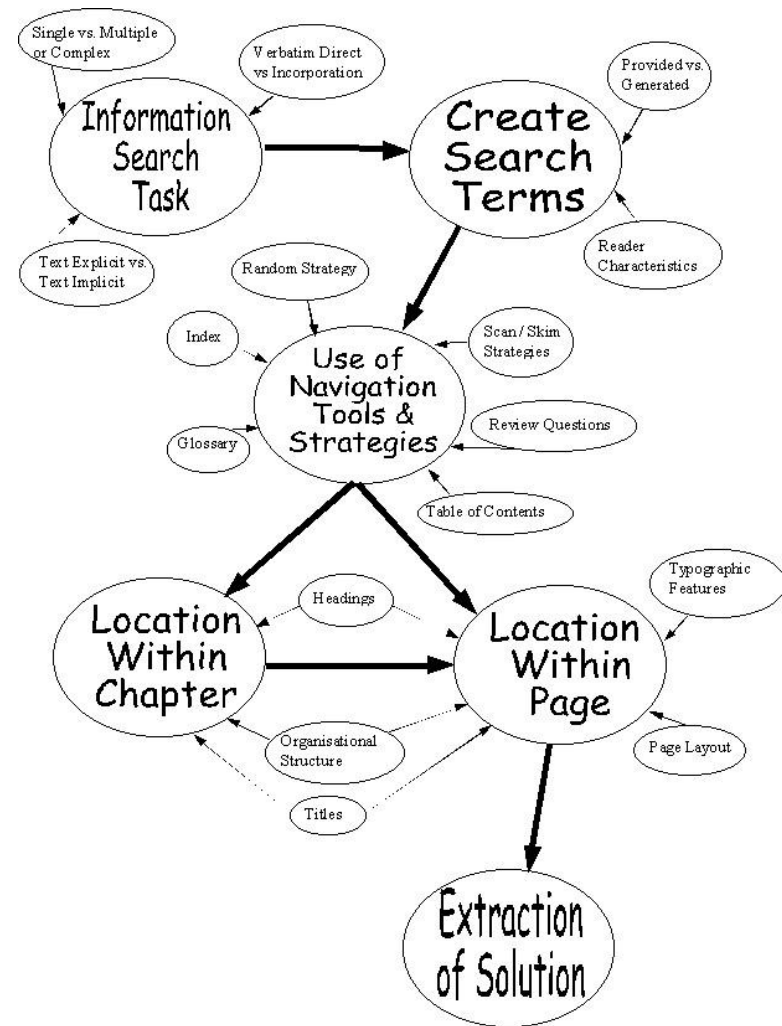
[E]very science or engineering lesson is in part a language lesson...


Students should be able to interpret meaning from text, to produce text in which written language and diagrams are used to express scientific ideas, and to engage in extended discussion about those ideas.

Framework for K-12 Science pg 76

So What

Does this mean in
K-12 classrooms?






Looking for patterns – define - explore

- How might we define “informational texts”?
- What are examples of “informational texts” in mathematics and science?
- What are some informational text connections we are making in mathematics and science classrooms?

Informational Text Is Informational Text Is Not

- Form six groups:
 - 2 *math* groups
 - 2 *science* groups
 - 2 *other* groups
- Select a content appropriate chart and, as a group, write your responses to the question on the chart.
- When time is called, rotate to the next content appropriate chart.



Looking for patterns – define - explore

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Examples of Informational Text in Science



CLEAN SOLES

NICOLA ALEXANDER SELECTS SHOES THAT LEAVE A LIGHTER FOOTPRINT ON THE PLANET

If you buried some of Simple's trainers, they would eventually disappear. The company makes shoes out of materials that are as close as possible to their natural state: jute, cork, natural crepe rubber and wool felt. They come in three categories of eco-friendliness: Good, Better and Best. These, called "Wheels", are in the Better group and have suede uppers from an eco-certified tannery, organic cotton plaid collar and lining, organic cotton laces and a recycled car tyre sole. This women's pair costs £80 and comes in different colour combinations, but there are plenty more styles to choose from for men and women. www.simpleshoes.com

<p>VIVO BAREFOOT £75</p>  <p>Made from recycled and sustainable components, the sole of the 'Root' shoe for men provides protection while allowing the benefits of going barefoot. These shoes also strengthen the foot muscles. www.femaplaza.com</p>	<p>EARTH GODDESS £85-50</p>  <p>The feminine 'Danu' is from Bohemian Bohemia's Earth Goddess range, and is made from organic hemp, metallic silver microfibre and has a silal rubber sole. Hemp needs little or no pesticides or herbicides. www.bbohemie.com</p>	<p>PO-ZU SEQUOIA £145</p>  <p>Po-Zu/Maharishi boots for men contain 95% biodegradable materials. Air pockets in the 'foam mattress' react to body heat, weight and movement, gradually moulding to the shape of your foot. www.thenaturalstore.co.uk</p>
<p>VEJA VOLLEY £72</p>  <p>Veja follows Fairtrade principles. These trainers for men support wild rubber production in the Amazon basin and use ecological leather. Cool and lightweight, these shoes are also available in khaki. www.adili.com</p>	<p>PATAGONIA WILKINS £65</p>  <p>The 'Low Tide' women's trainer is a soft shoe with minimalist styling. It boasts natural, all-hemp uppers that feel light on the feet and the rubber outer sole has 20% recycled content. www.naturalcollection.com</p>	<p>ECO SNEAKS £36.70</p>  <p>This women's shoe has silk gingham uppers, 100% organic cotton linings, laces from recycled plastic and soles from recycled tyres. Eco Sneaks are shipped in a 'post-consumer' recycled box. www.simpleshoes.com</p>

WWW.KEEFNATCOLLO.DK | 91

scientific texts (such as papers, the Internet, symposia, and lectures) pg 53

symbolic representations pg 66

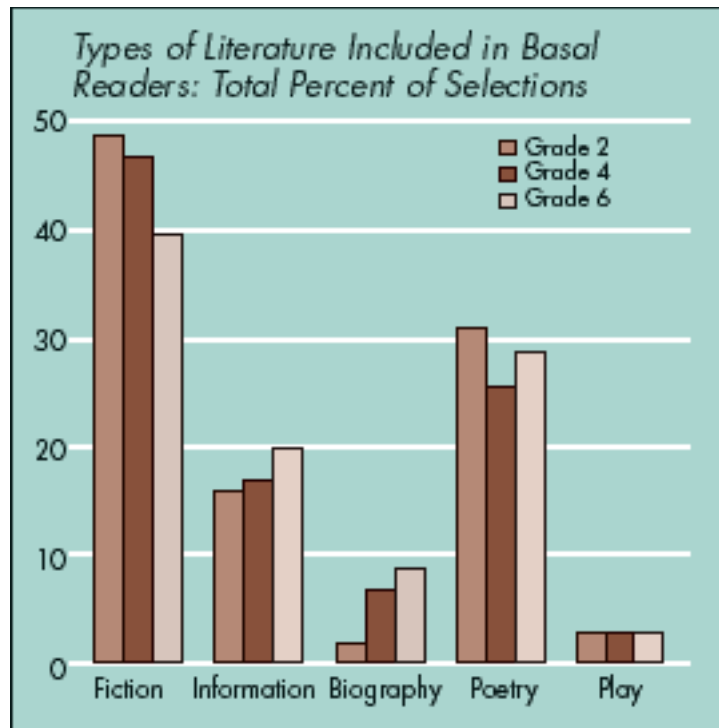
diagrams, charts, graphs, images pg 74

sketches, diagrams, graphs, models, and products. Also...handbooks... pg 75

peer-reviewed journals, books, conference presentations, and carefully constructed websites pg 75

diagrams ...plots and tables... journals... reports or posters... pg 78

Examples of Informational Text in Mathematics



equations, verbal descriptions, tables, and graphs

concrete referents such as objects, pictures, drawings, diagrams, and actions

diagrams, two-way tables, graphs, flowcharts and formulas

concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software

<http://www.corestandards.org/Math/Practice>

Informational Text and Performance Connections

78.4% of 7th graders identified as needing further instruction in the English/Language Arts domain for Reading Informational Texts. Palmetto Assessment of State Standards (PASS) 2010

Of all middle grades students identified as needing additional instruction in Reading Informational Texts:

67.9% failed to meet standards for **science**

67.3% failed to meet standards for **mathematics**

SC Department of Education, Office of Assessment, 2011

Informational Text and Responsibility Connections

“In K–5...the Standards demand that *a significant amount of reading of informational texts take place in and outside the ELA classroom.*

Because the ELA classroom must focus on literature (stories, drama, and poetry) as well as literary nonfiction, a great deal of *informational reading in grades 6–12 must take place in other classes* if the NAEP assessment framework is to be matched instructionally.”

Informational Text and Research Connections

IQ-MS - Inquiring Minds: Reading to Learn and Innovate in Mathematics and Science

- 10 schools selected for treatment and 10 for control
- On-site specialists work with mathematics and science teachers at treatment sites to incorporate purposeful reading, meaningful writing, and productive dialogue into their instruction



Informational Text and Research Connections

- Novices narrowly define informational text
- Experts identify a broad range of materials as informational text
- Novices mechanically apply informational text processing strategies
- Experts are able to flex and adapt strategies to best suit learning outcomes
- Novices adapt informational text strategies based on their preferences
- Experts adapt informational text strategies based on instructional intention
- Novices assign informational text strategies to students
- Experts model informational text strategies with students
- Novices take steps and missteps in using informational text strategies
- Experts take strides in using informational text strategies

Informational Text and Content Literacy Connections

- **acquisition of new content**
- **create**
- **participate fully in their community
and wider society**

How do we move forward?

What are some:

Steps you are **A**lready taking?

Additional steps must you take?

Thing you **H**ave to think about?

