Common Core
Georgia Performance Standards

Literacy in History, Social Studies, Science and Technical Subjects for High School

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Welcome

Reading and Writing in the Science Classroom

Presenters:
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Body of Research
Science Proficiency

Students who are proficient in science:

1. Know, use, and interpret scientific explanations of the natural world;

2. Generate and evaluate scientific evidence and explanations;

3. Understand the nature and development of scientific knowledge; and

4. Participate productively in scientific practices and discourse.
1. How can students’ work in literacy support their understanding of science?

2. How can their work in science actually improve literacy skills?

Negotiating Science: The Critical Role of Argument in Student Inquiry
Sample Lesson
Diversity of Cells

by Jodi Wheeler-Toppen, Ph.D.
Literacy Design Collaborative

by Mary Lynn Huie, Ph.D.
What is LDC?

• LDC tools embed Common Core Literacy Standards into content-area lessons so that students meet the Literacy Standards while also meeting content demands at high levels of performance.
How does LDC work?

• LDC templates help teachers write content-specific Teaching Tasks that require reading and writing to complete.
• LDC tools then help teachers identify the literacy skills students will need to complete the assigned Teaching Tasks.
• The templates then suggest instruction to help students acquire those skills.
A Good Teaching Task Should--

- Challenge students to engage in a substantial issue within the academic discipline,
- Model high levels of thinking, reading, and writing,
- Require work that will challenge students’ thinking and literacy practices beyond what they can already do without teaching support.
Templates for the Teaching Tasks

Teachers fill in the template to create a teaching task—a major student assignment to be completed over two or more weeks.

The content can be science, history, language arts, or another subject.
How It Works

An Example: Template 1

Task 1 Template (Argumentation/Analysis L1, L2, L3):
After researching ____________(informational texts) on _____________(content), write ____________ (essay or substitute) that argues your position on ______ (content). Support your position with evidence from your research. L2 Be sure to acknowledge competing views. L3 Give examples from past or current events or issues to illustrate and clarify your position.
After researching _________________ on ____________, write an ___________ that argues your position on ____________________. Support your position with evidence from your research. L2 Be sure to acknowledge competing views. L3 Give examples from past or current events or issues to illustrate and clarify your position.
Template 4 (Argumentation/Comparison)

• Template 4: [Essential Question] After reading [literature or informational texts], write an [essay or substitute] that compares [content] and argues [content]. Be sure to support your position with evidence from the text(s).
A High School Science Task

• Which type of evidence is more trustworthy, DNA evidence or eyewitness testimony? After reading informational texts, write a lawyer’s closing arguments to a jury that compares DNA evidence and eyewitness testimony and argues which the jury should privilege. Be sure to support your position with evidence from the text(s).
Georgia Science Standards

• Biology DNA Forensics
• SB2. Students will analyze how biological traits are passed on to successive generations.
• f. Examine the use of DNA technology in forensics, medicine, and agriculture.
• SCSH6. Students will communicate scientific investigations and information clearly.
• b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.
LDC Skills Analysis

The LDC design team offers a sample list of skills that teachers can consider and then:

- Use without changes
- Use with changes
- Replace with another list based on their judgment about their task and their students
Instructional Ladders

• The LDC templates include mini-tasks that help students acquire the necessary skills. Teachers are free to adopt or adapt the mini-tasks and the order in which they are presented within the Skills Cluster.
Galileo

• “In police lineups, is the method the suspect?” 1300L
  Llana, Sara Miller
• “DNA's Dirty Little Secret.” 1400L
  Washington Monthly (Mar/Apr2010)—Bobelian, Michael
• “Forensic evidence goes on trial.” 1260L
  New Scientist (2/28/2009)—Geddes, Linda
LDC in 2012-2013

Our goal for 2012-13 is to have excellent examples of LDC Instructional Modules available to Georgia teachers of ELA, history/social studies, science, and technical subjects. Teachers will be able to adopt the modules as they are or adapt them for their own instructional needs.

We also expect to have a strong corps of teachers and RESA/GLRS specialists trained for delivering in-services in their schools, their districts, and neighboring districts.
Three Sets of Standards

- College and Career Readiness Standards
- Common Core Georgia Performance Standards (CCGPS)
- Literacy Standards for History/Social Studies, Science, and Technical Subjects
How the Standards Compare

**CCRR2**: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

**ELACC7RL2**: Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.

**L9-10RST2**: 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.
How the Standards Compare

**CCW2:** Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

**ELACC7W2:** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

**L9-10WHST2:** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
Problems with Content Area Reading

- Literacy is not as generalizable as once thought
- Some practices make no sense in content disciplines
- Generic strategies are less helpful to struggling readers
- Pre-service teachers may resist non-disciplinary courses
Why Disciplinary Literacy?

- College and career ready students to be proficient in reading complex informational text independently in a variety of content areas

- Required reading in college and workforce training programs is informational in structure and challenging in content

- Postsecondary education programs provide students with both a higher volume of such reading and comparatively little scaffolding

The addition of specific Literacy Standards for content areas beyond the language arts classroom is designed to address and ensure this critical interdisciplinary approach
The Standards

http://www.doe.k12.ga.us/Curriculum-Instruction-and-Assessment/Curriculum-and-Instruction/Pages/CCGPS.aspx
## Science Literacy

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<th>ELA</th>
<th>Science</th>
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<tr>
<td></td>
<td>Context sometimes important</td>
<td>Context usually not important</td>
</tr>
<tr>
<td></td>
<td>Author and author’s perspective of primary importance</td>
<td>Facts of primary importance</td>
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<tr>
<td></td>
<td>Nuance and complexity of language; desire for readers to</td>
<td>Clarity and precision of language with a single clear point</td>
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<tr>
<td></td>
<td>have more than one interpretation</td>
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**Dr. John D. Barge, State School Superintendent**

“Making Education Work for All Georgians”
Connecting Practices

MATH
M1. Make sense of problems & persevere in solving them
M8. Look for & express regularity in repeated reasoning

SCIENCE
S1. Ask questions & define problems
S2 S4. Analyze & interpret data
S5. Use mathematics & computational thinking
M2. Reason abstractly and quantitatively
S3. Plan & carry out investigations
M6. Attend to precision

ELA
E1. Demonstrate independence and proficiency in comprehending text complexity
E2. Build strong content knowledge
E3. Respond to the varying demands of audience, talk, purpose, and discipline
E4. Comprehend as well as critique
E5. Value and Engage in argument from evidence
E7. Come to understand other perspectives and cultures

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"Making Education Work for All Georgians"
### LITERACY STANDARDS FOR READING IN SCIENCE AND TECHNICAL SUBJECTS (RST) GRADE 9-10

#### Key Ideas and Details

**L9-10RST1**: Cite specific textual evidence to support analysis of *science and technical* texts, attending to the *precise details* of explanations or descriptions.

**L9-10RST2**: 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.

**L9-10RST3**: Follow precisely a *complex multistep procedure* when carrying out *experiments*, taking *measurements*, or performing *technical tasks* attending to special cases or exceptions defined in the text.

#### Craft and Structure

**L9-10RST4**: Determine the meaning of *symbols, key terms, and other domain-specific words* and phrases as they are used in a specific *scientific or technical context* relevant to *grades 9–10 texts and topics*.

**L9-10RST5**: Analyze the structure of *the relationships among concepts* in a text, including relationships among *key terms* (e.g., *force, friction, reaction force, energy*).

**L9-10RST6**: 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.
### Integration of Knowledge and Ideas

**L9-10RST7:** 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.

**L9-10RST8:** 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.

**L9-10RST9:** 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.

### Range of Reading and Level of Text Complexity

**L9-10RST10:** By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
Survey

Thank you for participating in this CCGPS Professional Learning Session. We value your feedback! Please go to the following website, take the anonymous feedback survey, and complete the participation log to receive a certificate of participation:

http://survey.sedl.org/efm/wsb.dll/s/1g10a
We look forward to hearing from you!

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