

6th – 8th Grade Science and Technical Subjects



A Teacher's Guide to the Literacy Standards in Science and Technical Subjects

Model Content Frameworks

www.parcconline.org

Although PARCC has not designed Model Content Frameworks for History/Social Studies and Science/Technical Subjects, the following information will assist district staff in understanding the design of these tools. Illinois has chosen to move ahead with a teacher's guide for 6-12 Content Areas that compliments the 3rd – 11th grade teacher guides based on the PARCC information.

The Model Content Frameworks are voluntary resources offered by PARCC to help curriculum developers and teachers as they work to implement the standards in their states and districts. The Model Content Frameworks offer one way of organizing the standards — in this instance into quarterly modules. Equally successful models could be based around semesters, trimesters or other school schedules. Model Content Frameworks allow educators the flexibility to order the modules and the content within the modules in any way that suits their desired purposes. Because the knowledge and skills embedded across the four modules address all the standards for a given grade level, the order in which the four modules may be used is not critical. The Model Content Frameworks are designed with the following purposes in mind:

1. Supporting implementation of the Common Core State Standards, and
2. Informing the development of item specifications and blueprints for the **PARCC assessments** in grades 3–8 and high school.

The proposed **PARCC Assessment System** will be designed to measure knowledge, skills and understandings essential to achieving college and career readiness. In ELA/Literacy, these include the following areas as defined by the standards:

Reading complex texts:

1. This requires students to read and comprehend a range of grade-level complex texts, including texts from the domains of ELA, science, history/social studies, technical subjects and the arts.
2. Because vocabulary is a critical component of reading comprehension, it will be assessed in the context of reading passages.
3. Students are expected to conduct close, analytic readings as well as compare and synthesize ideas across texts.

Each module suggests both the number and types of texts that students read and analyze. Students then write about these texts either to express an opinion/make an argument or to inform/explain. In addition, research and narrative writing tasks appear in each module.

Writing effectively when using and/or analyzing sources:

This requires students to demonstrate the interrelated literacy activities of reading, gathering evidence about what is read, as well as analyzing and presenting that evidence in writing.

Conducting and reporting on research:

This expands on “writing when analyzing sources” to require students to demonstrate their ability to

1. gather resources,
2. evaluate their relevance, and
3. report on information and ideas they have investigated (i.e., conducting research to answer questions or to solve problems).

The importance of the above skills is reflected in the emphasis the Model Content Frameworks place on students' needing regular opportunities to grapple with the **close, analytic reading** of grade-level complex texts and to construct increasingly sophisticated **responses in writing**. The Model Content Frameworks therefore provide a helpful guide in preparing students for the future **PARCC assessments**.

6th – 8th Model Curriculum for Science and Technical Subjects
Optional model to consider when constructing a year long course of instruction.
1st Quarter-Length Module

Reading Science and Technical Texts

Strive to infuse as many of the following reading standards into each quarter as possible, making sure to amply cover them all to proficiency by the end of the 8th grade year.

Teach these skills with the content that students read.

- Cite specific textual evidence to support analysis of science and technical texts
- Determine the central ideas or conclusions of a text
- Provide an accurate summary of a source distinct from prior knowledge or opinions
- Follow precisely a multistep procedure when carrying out experiments, taking measurements or performing technical tasks
- Determine the meanings of symbols, key terms, and other domain-specific words and phrases
- Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic
- Analyze the author’s purpose in providing an explanation, describing a procedure or discussing an experiment in a text
- Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph or table)
- Distinguish among facts, reasoned judgment based on research findings, and speculation in a text
- Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic

Writing About Texts

Write Routinely Over Extended Time Frames and for a Range of Discipline-Specific Tasks, Purposes and Audiences



- Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose and audience.
- With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
- Use technology, including the internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Writing Arguments

- Introduce claims about a topic or issue and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically
- Support claims with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources
- Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence
- Establish and maintain a formal style
- Provide a concluding statement or section that follows from and supports the argument presented



Writing Research Projects

- Conduct short research projects to answer a question (including a self-generated question)
- Use multiple print and digital sources
- Assess the credibility and accuracy of each source
- Quote or paraphrase the data and conclusions of other while avoiding plagiarism and following a standard format for citation
- Draw evidence from informational texts to support analysis, reflection and research.

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2nd Quarter-Length Module

Reading Science and Technical Texts

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- Determine the central ideas or conclusions of a text
- Provide an accurate summary of a source distinct from prior knowledge or opinions
- Follow precisely a multistep procedure when carrying out experiments, taking measurements or performing technical tasks
- Determine the meanings of symbols, key terms, and other domain-specific words and phrases
- Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic
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Writing Informative/Explanatory Texts, Including the Narration of Scientific Procedures/Experiments or Technical Processes

- Introduce a topic clearly, previewing what is to follow: organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension
- Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
- Use appropriate and varied transitions to create cohesion and clarify the relationship among ideas and concepts
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Establish and maintain a formal style and objective tone
- Provide a concluding statement or section that follows from and supports the information or explanation provided



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Optional model to consider when constructing a year long course of instruction.

3rd Quarter-Length Module

Reading Science and Technical Texts

Strive to infuse as many of the following reading standards into each quarter as possible, making sure to amply cover them all to proficiency by the end of the 8th grade year.

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- Provide an accurate summary of a source distinct from prior knowledge or opinions
- Follow precisely a multistep procedure when carrying out experiments, taking measurements or performing technical tasks
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6th – 8th Grade Model Curriculum for Science and Technical Subjects

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4th Quarter-Length Module

Reading Science and Technical Texts

Strive to infuse as many of the following reading standards into each quarter as possible, making sure to amply cover them all to proficiency by the end of the 10th grade year.

Teach these skills with the content that students read.

- Cite specific textual evidence to support analysis of science and technical texts
- Determine the central ideas or conclusions of a text
- Provide an accurate summary of a source distinct from prior knowledge or opinions
- Follow precisely a multistep procedure when carrying out experiments, taking measurements or performing technical tasks
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6th – 8th Grade Samples of Text Exemplars and Performance Tasks for Science and Technical Subjects

Taken from www.corestandards.org

Cathedral: The Story of Its Construction, Macaulay, David

Students *integrate* the *quantitative or technical information* expressed in the text of David Macaulay's *Cathedral: The Story of its Construction* with the information conveyed by the *diagrams* and *models* Macaulay provides, developing a deeper understanding of Gothic architecture. [RST.6-8.7]

The Building of Manhattan, Mackay, Donald

Students construct a holistic picture of the history of Manhattan by *comparing and contrasting the information gained from* Donald Mackay's *The Building of Manhattan* with the *multimedia sources* available on the "Manhattan on the Web" portal hosted by the New York Public Library (<http://legacy.www.nypl.org/branch/manhattan/index2.cfm?Trg=1&d1=865>). [RST.6-8.9]

The Number Devil: A Mathematical Adventure, Enzensberger, Hans Magnus

Math Trek: Adventures in the Math Zone, Peterson, Ivars and Nancy Henderson

Students learn about fractal geometry by reading Ivars Peterson and Nancy Henderson's *Math Trek: Adventures in the Math Zone* and then generate their own fractal geometric structure by *following the multistep procedure* for creating a Koch's curve. [RST.6-8.3]

Geeks: How Two Lost Boys Rode the Internet out of Idaho, Katz, John

"The Evolution of the Grocery Bag", Petroski, Henry

"Geology", U*X*L Encyclopedia of Science

Astronomy & Space: From the Big Bang to the Big Crunch, "Space Probe"

New Book of Popular Science, "Elementary Particles"

Invasive Plant Inventory, California Invasive Plant Council