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# SCIENCE TOPIC OUTREACH POSTERS

## COMMON CORE STATE STANDARDS

Science Topic Outreach Posters (STOP) promote skills and learning processes detailed in the Common Core State Standards Initiative ( <http://www.corestandards.org> ). The comprehensive K-5 section includes English Language Arts Standards and Mathematical Standards, while a content-area specific section addresses Literacy in Science at the grade 6-12 level.

The specific “Common Core Standards for Science” are still in development. However, STOP for Science includes the following areas of the National Science Education Standards (<http://www.nsta.org/publications/nses.aspx>):

### **Unifying Concepts & Processes**

#### **Science as Inquiry**

#### **Physical Science**

#### **Life Science**

#### **Earth & Space Science**

#### **Science & Technology**

#### **History & Nature of Science**

## ENGLISH LANGUAGE ARTS STANDARDS

### **A. Reading: text complexity and the growth of comprehension**

A key feature of the Reading Standard places equal emphasis on the sophistication of what students read and the skill with which they read. Rigor is infused through the requirement that students read increasingly complex texts through the grades.

**Whatever they are reading, students must also show a steadily growing ability to discern more from and make fuller use of text, including making an increasing number of connections among ideas and between texts, considering a wider range of textual evidence...**

*In a similar manner, the sequence of questions posed on Science Topic Outreach Posters intensifies in rigor and requires greater higher-order thinking skills. Questions are divided into three sets, with three questions in each set. Questions increase in sophistication, complexity, as well as background knowledge required in answering the questions.*



## **STOP MATERIALS INCORPORATE THE FOLLOWING READING ANCHOR STANDARDS:**

### **Key Ideas and details**

#1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

### **Craft and Structure**

#4 Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

### **Integration of Knowledge and Ideas**

#7 Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

### **Range of reading and Level of text Complexity**

#10 Read and comprehend complex literary and informational texts independently and proficiently.

### **B. Writing: text types, responding to reading, and research**

The Writing Standard requires learners to demonstrate increasing sophistication in all aspects of language use, from vocabulary and syntax to the development and organization of ideas, and they should address increasingly demanding content. This Standard stresses the importance of the writing-reading connection by requiring students to draw upon and write about evidence from literary and informational texts.

*Answers required in response to Science Topic Outreach Posters grow in complexity from simple selections (multiple-choice) to student-generated responses complete with rationale for answers. Lower numbered questions may require one word responses, but as question numbers increase so do the demands required to respond. The learner increasingly analyzes and synthesizes information presented in the poster, extends meaning, applies concepts to new situations, and constructs responses.*

## **STOP MATERIALS INCORPORATE THE FOLLOWING WRITING ANCHOR STANDARDS:**

### **Text types and Purposes**

#1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

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



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## **Production and distribution of Writing**

#4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

## **Research to Build and Present Knowledge**

#9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

## **Range of Writing**

#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.

## **C. Speaking and Listening: flexible communication and collaboration**

The Speaking and Listening Standard recognizes the importance of interaction as part of the learning process. Learning may be enhanced through the exchange of ideas; yet there are many skills required for productive discourse to take place.

*The Science Topic Outreach Poster program supports individual, partner or group participation. STOP program instructions encourage discussion and collaboration for those who desire this method of participation, and materials provide multiple lines for participants' names allowing groups to submit answers using one form.*

## **STOP MATERIALS INCORPORATE THE FOLLOWING SPEAKING AND LISTENING ANCHOR STANDARDS:**

### **Comprehension and Collaboration**

#1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

#2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

#3 Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

### **Presentation of Knowledge and Ideas**

#5 Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.



## **MATHEMATICAL STANDARDS**

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “process and proficiencies” with longstanding importance in mathematics education.

*The Science Topic Outreach Poster program reinforces student exposure to various math processes while providing real-life utilization in specific math content areas. Students gain opportunities for exploration of concepts and manipulation of data presented on posters, further enhancing math skills.*

### **STOP MATERIALS INCORPORATE THE FOLLOWING MATHEMATICAL PROCESS STANDARDS:**

**Make sense of problems and persevere in solving them**

**Reason abstractly and quantitatively**

**Construct viable arguments and critique the reasoning of others**

**Model with mathematics**

**Use appropriate tools strategically**

**Attend to precision**

### **STOP MATERIALS INCORPORATE THE FOLLOWING STANDARDS FOR MATHEMATICAL CONTENT:**

#### **Operations and Algebraic Thinking**

- Represent and solve problems involving addition and subtraction.
- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.
- Use the four operations with whole numbers to solve problems.

#### **Number and Operations in Base Ten**

- Understand the place value system.
- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.



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## **Measurement and Data**

- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Represent and interpret data.
- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

## **The Number System**

- Compute fluently with multi-digit numbers.

## **Ratios and Proportional Relationships**

- Understand ratio concepts and use ratio reasoning to solve problems.



## READING STANDARDS FOR LITERACY IN SCIENCE & TECHNICAL SUBJECTS (GR. 6-8)

**STOP MATERIALS INCORPORATE THE FOLLOWING READING STANDARDS FOR LITERACY IN SCIENCE AND TECHNICAL SUBJECTS:**

### **Key Ideas and details**

#1 Cite specific textual evidence to support analysis of science and technical texts.

### **Craft and Structure**

#4 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 6–8 texts and topics.

#5 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.

### **Integration of Knowledge and Ideas**

#7 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).

#10 By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

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# SCIENCE TOPIC OUTREACH POSTERS

## WRITING STANDARDS FOR LITERACY IN SCIENCE & TECHNICAL SUBJECTS (GR. 6-12)

STOP MATERIALS INCORPORATE THE FOLLOWING WRITING STANDARDS FOR LITERACY IN SCIENCE AND TECHNICAL SUBJECTS:

### Text types and Purposes

#1 Write arguments focused on discipline-specific content.

- c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.

### Production and distribution of Writing

#4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

### Research to Build and Present Knowledge

#9 Draw evidence from informational texts to support analysis reflection, and research.

### Range of Writing

#10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.