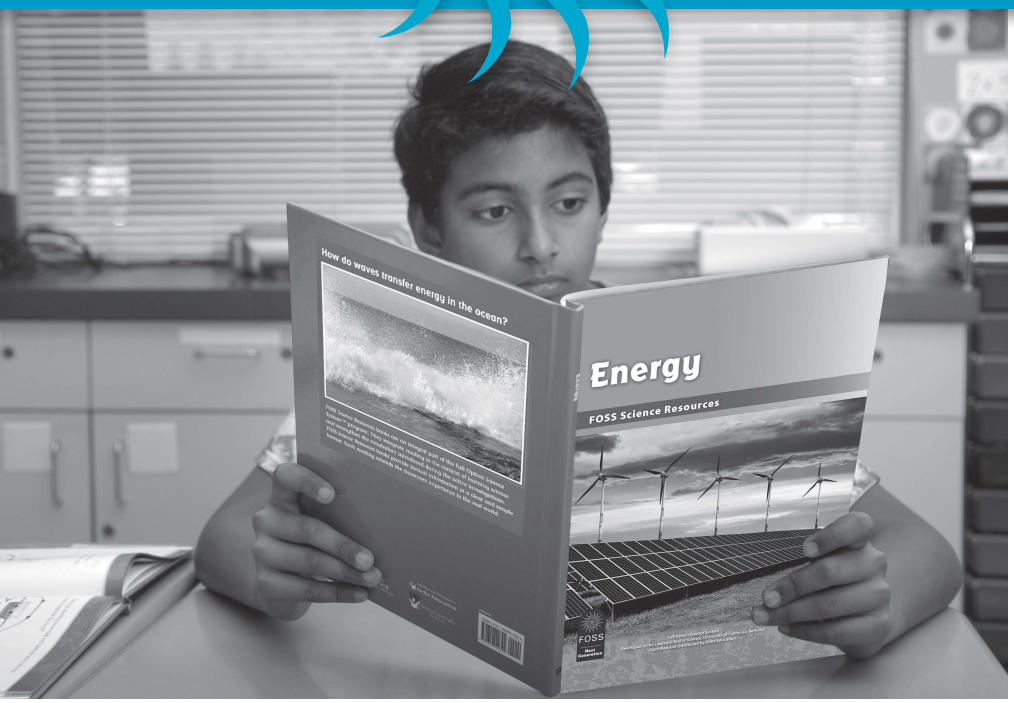
FOSS and Common Core ELA — Grade 4



Contents

INTRODUCTION

Each FOSS investigation follows a similar design to provide multiple exposures to science concepts. The design includes these pedagogies.

- Active investigation, including outdoor experiences
- Writing in science notebooks to answer focus questions
- Reading in *FOSS Science Resources*
- Assessment to monitor progress and motivate student reflection on learning

In practice, these components are seamlessly integrated into a continuum designed to maximize every student's opportunity to learn. An instructional sequence may move from one pedagogy to another and back again to ensure adequate coverage of a concept.

The FOSS instructional design recognizes the important role of language in science learning. Throughout the pedagogical design elements, students engage in the practices of the Common Core State Standards for English Language Arts. The purpose of this chapter is to provide the big picture of how FOSS provides opportunities for the development and exercising of these practices through science. The following pages have a table that identifies these opportunities in the three FOSS modules for the fourth grade.

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Guiding Principles

When integrating language-arts instruction with FOSS, keep in mind these guiding principles:

- FOSS investigations follow a clear and coherent conceptual flow and a consistent instructional design. Students develop science knowledge by building a framework of concepts and supporting ideas.
- Common Core State Standards for ELA are introduced, developed, and practiced in the context of learning science content and engaging in the science and engineering practices. Students read and comprehend complex science texts related to their prior experience and knowledge. They write informational/explanatory texts, arguments to support claims, and narratives about experiences in science. They engage in collaborative discussions about science and learn new vocabulary and language structures in context.
- The decision to use additional science texts, writing tasks, oral discourse opportunities, and vocabulary development activities is based on how well they address the science as well as the ELA standards.
- Instruction is differentiated to meet the needs of all students; the linguistic accommodations that are made for English learners support comprehensible input and accelerate academic language development. Language objectives for English learners in science instruction include the application of strategies that support construction of meaning from academic discussions and complex text, participation in productive discourse, and the ability to express ideas in writing clearly and coherently according to task, purpose, and audience.
- Formative assessment tools are used routinely to measure progress toward science understanding, use of science and engineering practices, and meeting literacy and language development goals. Assessment is viewed as a way to make student thinking visible and to determine next steps for instruction for both science and literacy. Instruction includes opportunities for students to assess themselves and peers.

Adhering to these guiding principles optimizes instructional time and, most importantly, benefits student learning by providing authentic and relevant contexts for building content knowledge, applying meaning-making strategies, and developing language and literacy skills.

Fourth grade marks an important transition to using literacy skills as tools for making meaning in content areas. Fourth graders read widely and deeply from a range of challenging informational texts that support

their content learning and expand their vocabulary. They communicate in more complex and flexible ways that demonstrate understanding of purpose and audience. Fourth graders are expected to use the science and engineering practices to demonstrate their understanding of the core ideas. To accomplish this, students apply language structures for sequencing, comparing and contrasting, determining cause-and-effect relationships, and problem-solving.

Instructional Flow

In almost all investigations, the instructional flow is the same and provides these opportunities for effective integration of ELA standards.

- When **setting the context** for the lesson, students activate prior knowledge through class or small-group discussions where they recount an experience using appropriate facts and relevant, descriptive details (SL 4).
- During the **active investigation**, students are expected to work with partners and in collaborative groups, and to engage in teacher-led discussions where they build on each other's ideas and express their own clearly (SL 1).
- In the **data management** phase, students make observations, and then routinely record and organize data in their notebooks (W 10). The notebook provides a space for students to recall information from experience, gather information from print and other media, take notes, and categorize information (W 8) and to acquire and use general academic and domain-specific words and phrases (L 6).
- The **analysis** phase involves discussing data, constructing and writing explanations, and engaging in argumentation. Here, students are making meaning by writing explanatory texts (W 2), writing opinion pieces supporting a point of view with reasons (W 1), or conducting short research projects that build knowledge through investigation of different aspects of a topic. (W 7).
- **Reading** articles in *FOSS Science Resources* and other recommended readings provides a plethora of opportunities to address all the fourth-grade reading standards for informational text.
- Lastly, the **assessment** tools and next-step strategies for engaging students in high-level critical thinking support the development of the Common Core State Standards capacities of the literate individual: demonstrate independence, build strong content knowledge, comprehend as well as critique, and value evidence.

Again, we have provided you with some examples of how FOSS connects to the fourth-grade ELA standards; there are many more opportunities waiting to be created and explored by you and your students.

TEACHING NOTE

Throughout the fourth-grade FOSS modules, opportunities for addressing the ELA standards have been noted; however these examples should not be considered the only places for integrating literacy skills.

READING STANDARDS FOR INFORMATIONAL TEXT

	Standard	Energy Module
Key Ideas and Details	1. Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	Discuss articles in *FOSS Science Resources* Inv 1, Part 1, Step 21; Inv 1, Part 2, Step 26 Inv 1, Part 3, Step 29; Inv 1, Part 4, Step 13 Inv 2, Part 2, Step 26; Inv 2, Part 3, Step 23 Inv 3, Part 1, Step 19; Inv 3, Part 3, Step 15 Inv 4, Part 2, Steps 17, 18; Inv 4, Part 3, Step 19 Inv 5, Part 1, Step 21; Inv 5, Part 2, Step 30; Inv 5, Part 3, Step 24
	2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.	Discuss and review articles in *FOSS Science Resources* Inv 1, Part 2, Step 25; Inv 1, Part 3, Step 29 Inv 2, Part 2, Step 26; Inv 2, Part 3, Step 22 Inv 3, Part 1, Step 18; Inv 3, Part 2, Step 14 Inv 4, Part 1, Steps 15, 16; Inv 4, Part 3, Step 21 Inv 5, Part 2, Steps 24, 29, 30; Inv 5, Part 3, Step 23
	3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	Discuss articles in *FOSS Science Resources* Inv 1, Part 1, Step 21; Inv 1, Part 2, Step 26 Inv 1, Part 3, Step 30; Inv 1, Part 4, Step 13 Inv 2, Part 2, Step 26; Inv 2, Part 3, Steps 19, 20, 23 Inv 3, Part 1, Step 19; Inv 3, Part 2, Step 16; Inv 3, Part 3, Step 15; Inv 4, Part 1, Step 15: Inv 4, Part 2, Step 19; Inv 4, Part 3, Step 19; Inv 5, Part 1, Step 21 Inv 5, Part 2, Steps 24, 30; Inv 5, Part 3, Step 24
Craft and Structure	4. Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.	All investigations provide opportunities for students to determine the meaning of academic and science-specific words and phrases while reading articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Step 21; Inv 1, Part 2, Step 25 Inv 2, Part 2, Step 25; Inv 3, Part 1, Step 19 Inv 4, Part 2, Steps 17, 18; Inv 4, Part 3, Steps 21-25 Inv 5, Part 1, Steps 19–20; Inv 5, Part 2, Step 2
	5. Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.	Discuss text structure in *FOSS Science Resources* Inv 1, Part 3, Step 30; Inv 1, Part 4, Step 12 Inv 2, Part 3, Step 18; Inv 2, Part 3, Steps 20, 21 Inv 3, Part 3, Step 14 Inv 4, Part 2, Step 18 Inv 5, Part 3, Step 25

Common Core State Standards for English language arts and literacy in history/social studies science and technical subjects (National Governors Association Center for Best Practices and Council of Chief State School Officers, 2010).

Environments Module	Soils, Rocks, and Landforms Module
Discuss articles in *FOSS Science Resources* Inv 1, Part 1, Steps 18, 33; Inv 1, Part 2, Steps 16, 28 Inv 1, Part 3, Step 14 Inv 2, Part 1, Step 23; Inv 2, Part 2, Steps 19, 20, 22 Inv 2, Part 3, Steps 22, 25; Inv 2, Part 4, Steps 18, 20 Inv 3, Part 1, Step 15; Inv 3, Part 2, Steps 9, 17 Inv 3, Part 3, Step 13; Inv 3, Part 4, Step 18 Inv 4, Part 1, Steps 45, 48, 50; Inv 4, Part 2, Step 17	Discuss articles in *FOSS Science Resources* Inv 1, Part 1, Step 20; Inv 1, Part 3, Step 20 Inv 2, Part 1, Step 20; Inv 2, Part 4, Steps 18, 21 Inv 3, Part 1, Step 22; Inv 3, Part 2, Step 14 Inv 3, Part 4, Step 11 Inv 4, Part 1, Steps 10, 12; Inv 4, Part 2, Step 11 Inv 4, Part 3, Step 16
Discuss and review articles in *FOSS Science Resources* Inv 1, Part 1, Steps 17, 18, 32, 33; Inv 1, Part 2, Steps 28, 29; Inv 1, Part 3, Step 13 Inv 2, Part 1, Step 21; Inv 2, Part 2, Steps 18, 20 Inv 2, Part 3, Step 21; Inv 2, Part 4, Steps 17-18, 20 Inv 3, Part 1, Step 15; Inv 3, Part 2, Steps 6, 17 Inv 3, Part 3, Step 13; Inv 3, Part 4, Step 17 Inv 4, Part 1, Step 45, 49; Inv 4, Part 2, Step 16	Discuss and review articles in *FOSS Science Resources* Inv 1, Part 1, Step 19 Inv 2, Part 1, Step 19; Inv 2, Part 4, Steps 17, 18 Inv 3, Part 1, Steps 21-22; Inv 3, Part 2, Step 14 Inv 3, Part 4, Steps 10, 11 Inv 4, Part 1, Step 9; Inv 4, Part 2, Step 11; Inv 4, Part 3, Steps 13, 16
Discuss articles in *FOSS Science Resources* Inv 1, Part 1, Steps 18, 33; Inv 1, Part 2, Steps 16, 29 Inv 2, Part 1, Step 21; Inv 2, Part 2, Steps 19, 20 nv 2, Part 3, Step 22; Inv 2, Part 4, Steps 18, 20 Inv 3, Part 2, Steps 9, 17; Inv 3, Part 4, Step 18 Inv 4, Part 1, Steps 45, 48; Inv 4, Part 2, Step 17	Discuss articles in *FOSS Science Resources* Inv 1, Part 3, Step 20 Inv 2, Part 1, Step 20; Inv 2, Part 4, Steps 17, 18, 22 Inv 3, Part 1, Step 22; Inv 3, Part 4, Steps 10, 11 Inv 4, Part 3, Step 16
All investigations provide opportunities for students to determine the meaning of academic and science-specific words and phrases while reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Steps 17, 18; Inv 1, Part 2, Step 16 Inv 2, Part 2, Step 18; Inv 2, Part 4, Steps 16-20 Inv 3, Part 1, Step 15; Inv 3, Part 2, Steps 9, 17 Inv 4, Part 1, Step 50; Inv 4, Part 2, Step 17	All investigations provide opportunities for students to determine the meaning of academic and science-specific words and phrases while reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Step 19; Inv 1, Part 3, Step 20; Inv 1, Part 3, Step 20; Inv 2, Part 4, Step 22; Inv 3, Part 2, Step 13 Inv 4, Part 1, Step 11; Inv 4, Part 2, Step 11; Inv 4, Part 3, Step 16
Discuss text structure in *FOSS Science Resources* Inv 1, Part 1, Step 16; Inv 1, Part 2, Step 16 Inv 1, Part 3, Step 12 Inv 2, Part 1, Step 20; Inv 2, Part 2, Steps 3, 4 Inv 2,Part 3, Steps 21, 22; Inv 2, Part 4, Step 20 Inv 3, Part 2, Step 16; Inv 3, Part 3, Step 12	Discuss text structure in *FOSS Science Resources* Inv 1, Part 3, Step 20 Inv 3, Part 2, Step 13 Inv 4, Part 3, Step 14

READING STANDARDS FOR INFORMATIONAL TEXT

	Standard	Energy Module
Craft and Structure	6. Compare and contrast a firsthand and secondhand account of the same event or topic; describe the differences in focus and the information provided.	Read and compare articles in *FOSS Science Resources* to the active investigation. Selected examples Inv 1, Part 1, Step 21 Inv 2, Part 2, Step 25 Inv 3, Part 1, Step 17; Inv 3, Part 3, Step 15 Inv 4, Part 1, Steps 14, 15; Inv 4, Part 2, Step 19 Inv 4, Part 3, Step 17 Inv 5, Part 1, Step 20
Integration of Knowledge and Ideas	7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	Analyze and discuss illustrations used to support understanding in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Step 19; Inv 1, Part 2, Step 24 Inv 1, Part 3, Step 29; Inv 1, Part 4, Step 12 Inv 2, Part 2, Step 25; Inv 2, Part 3, Steps 21, 22 Inv 3, Part 1, Step 17; Inv 3, Part 2, Step 16 Inv 4, Part 1, Steps 13, 15; Inv 4, Part 2, Steps 17, 18 Inv 4, Part 3, Steps 17, 18, 21, 24 Inv 5, Part 3, Step 25
	8. Explain how an author uses reasons and evidence to support particular points in a text.	Read and discuss articles in *FOSS Science Resources* Inv 1, Part 3, Step 29 Inv 2, Part 3, Steps 21, 22 Inv 4, Part 3, Step 22
	9. Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	Students can read their *FOSS Science Resources* as well as readings suggested on FOSSweb. Using these two texts, students integrate the information when speaking and writing about science content. Selected examples Inv 1, Language Extensions. Read Mr. Henshaw Inv 3, Part 3, Step 16 Inv 4, Part 3, Step 22 Inv 5, Language Extensions. Travel through the looking glass.
Range of Reading	10. By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4–5 text complexity band proficiently, with scaffolding as needed at the high end of the range.	All investigations provide opportunities for students to develop their ability to read and comprehend complex informational science text such as *FOSS Science Resources*.

Environments Module	Soils, Rocks, and Landforms Module
Read and compare articles in *FOSS Science Resources* to the active investigation. Selected examples Inv 1, Part 2, Steps 27, 29; Inv 1, Part 3, Step 14 Inv 2, Part 4, Step 18 Inv 3, Part 1, Step 14; Inv 3, Part 2, Steps 9, 15, 17 Inv 4, Part 1, Step 47	Read and compare articles in *FOSS Science Resources* to the active investigation. Selected examples Inv 1, Part 1, Step 19 Inv 2, Part 1, Step 19; Inv 2, Part 4, Step 18 Inv 3, Part 1, Step 20
Analyze and discuss illustrations used to support understanding in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 16-18, 31; Inv 1, Part 2, Steps 14, 27 Inv 2, Part 1, Steps 20, 21, Inv 2, Part 2, Steps 18, 19, 21 Inv 2, Part 3, Step 21; Inv 2, Part 4, Steps 16, 19 Inv 3, Part 1, Steps 14-15; Inv 3, Part 2, Steps 7, 15 Inv 3, Part 4, Step 17 Inv 4, Part 1, Steps 47, 49; Inv 4, Part 2, Step 16	Analyze and discuss illustrations used to support understanding in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Step 19; Inv 1, Part 3, Steps 19, 20 Inv 2, Part 1, Step 18; Inv 2, Part 4, Steps 17, 20, 21 Inv 3, Part 1, Step 20; Inv 3, Part 2, Step 14 Inv 3, Part 4, Step 10 Inv 4, Part 1, Steps 9, 13; Inv 4, Part 2, Step 10 Inv 4, Part 3, Steps 12, 14
Read and discuss articles in *FOSS Science Resources* Inv 1, Part 1, Step 33 Inv 2, Part 3, Step 24; Inv 2, Part 4, Step 20 Inv 4, Part 1, Step 49	Read and discuss articles in *FOSS Science Resources* Inv 1, Part 1, Steps 19, 20; Inv 1, Part 3, Step 19 Inv 2, Part 4, Step 20
Students can read *FOSS Science Resources* as well as readings suggested on FOSSweb. Using these two texts, students integrate the information when speaking and writing about science content. Selected examples Inv 1, Part 3, Step 15 Inv 2, Part 2, Step 24; Inv 2, Part 3, Steps 15, 23 Inv 3, Part 3, Step 15 Inv 4, Part 1, Step 49; Inv 4, Part 2, Step 18	Students can read *FOSS Science Resources* as well as readings suggested on FOSSweb. Using these two texts, students integrate the information when speaking and writing about science content. Selected example Inv 3, Part 2, Step 15
All investigations provide opportunities for students to develop their ability to read and comprehend complex informational science text such as *FOSS Science Resources*.	All investigations provide opportunities for students to develop their ability to read and comprehend complex informational science text such as *FOSS Science Resources*.

READING STANDARDS: FOUNDATIONAL SKILLS

	Standard	Energy Module
Phonics and Word Recognition	3. Know and apply grade-level phonics and word analysis skills in decoding words. a. Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.	All investigations provide opportunities for students to apply decoding skills while reading articles in *FOSS Science Resources*. Selected example Inv 1, Part 1, Step 21
Fluency	4. Read with sufficient accuracy and fluency to support comprehension. a. Read grade-level text with purpose and understanding. b. Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings. c. Use context to confirm or self-correct word recognition and understanding, rereading as necessary.	All investigations provide opportunities for students to practice reading with accuracy and fluency. Selected examples Inv 1, Part 1, Step 20; Inv 1, Part 2, Step 25 Inv 1, Part 3, Step 29; Inv 1, Part 4, Step 12 Inv 2, Part 2, Step 25; Inv 2, Part 3, Steps 19, 22 Inv 3, Part 1, Step 19; Inv 3, Part 2, Steps 14, 16 Inv 3, Part 3, Step 14 Inv 4, Part 1, Step 14; Inv 4, Part 2, Step 18 Inv 4, Part 3, Steps 18, 21, 24 Inv 5, Part 1, Step 19; Inv 5, Part 2, Steps 23, 26, 29 Inv 5, Part 3, Steps 23, 25

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to apply decoding skills while reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Steps 17, 18; Inv 1, Part 2, Step 16 Inv 2, Part 4, Step 18	All investigations provide opportunities for students to apply decoding skills while reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Step 19; Inv 1, Part 3, Step 20 Inv 2, Part 4, Step 22
All investigations provide opportunities for students to practice reading with accuracy and fluency. Selected examples Inv 1, Part 1, Step 17; Inv 1, Part 2, Steps 15, 28 Inv 1, Part 3, Steps 12, 13 Inv 2, Part 1, Step 21, 22; Inv 2, Part 2, Step 18 Inv 2, Part 3, Steps 21, 24; Inv 2, Part 4, Steps 17, 19 Inv 3, Part 1, Step 15; Inv 3, Part 2, Steps 6, 15, 16 Inv 3, Part 3, Step 12; Inv 3, Part 4, Step 17 Inv 4, Part 1, Steps 45, 47, 49; Inv 4, Part 2, Step 16	All investigations provide opportunities for students to practice reading with accuracy and fluency. Selected examples Inv 1, Part 1, Step 19 Inv 2, Part 1, Step 19; Inv 2, Part 4, Steps 17, 21 Inv 3, Part 1, Step 21; Inv 3, Part 2, Step 13 Inv 3, Part 4, Step 10 Inv 4, Part 1, Step 9; Inv 4, Part 2, Step 10

WRITING STANDARDS

Text Types and Purposes

Standard	Energy Module
1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information. a Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose. b. Provide reasons that are supported by facts and details. c. Link opinion and reasons using words and phrases (e.g., *for instance, in order to, in addition*). d Provide a concluding statement or section related to the opinion presented.	All investigations provide opportunities for students to write their opinion, or claim, supported by reasons. Students answer questions (focus question, response sheets, assessments) by stating their claim supported by evidence and reasoning. Selected example Inv 1, Part 4, Step 10
2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within categories of information using words and phrases (e.g., *another, for example, also, because*). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.	All investigations provide opportunities for students to write explanatory texts to examine the science topic they are learning. In every part, students write an explanation as part of their answer to the focus question or the response sheet. Selected examples Inv 1, Part 1, Step 16; Inv 1, Part 2, Step 22 Inv 1, Part 3, Steps 14, 26, 27, 30 Inv 2, Part 1, Step 17; Inv 2, Part 2, Steps 22, 23 Inv 2, Part 3, Step 17 Inv 3, Part 1, Step 15; Inv 3, Part 2, Step 11 Inv 4, Part 2, Step 19; Inv 4, Part 3, Step 15 Inv 5, Part 2, Step 20 Students write a summary paragraph in the Wrap-up section at the end of every investigation.
3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences. a. Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally. b. Use dialogue and description to develop experiences and events or show the responses of characters to situations. c. Use a variety of transitional words and phrases to manage the sequence of events. d. Use concrete words and phrases and sensory details to convey experiences and events precisely. e. Provide a conclusion that follows from the narrated experiences or events.	All investigations provide opportunities for students to write narratives. Students describe their observations and experiences with the science ideas they are exploring. Selected examples Inv 1, Language Extensions. Imagine no electricity Inv 2, Language Extensions. Write a story Inv 3, Part 3, Step 12

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to write their opinion, or claim, supported by reasons. Students answer questions (focus question, response sheets, assessments) by stating their claim supported by evidence and reasoning. Selected examples Inv 1, Part 2, Steps 19, 33, 36, 37 Inv 2, Part 2, Step 22; Inv 2, Part 4, Step 15 Inv 3, Part 3, Step 8 Inv 4, Part 2, Step 15	All investigations provide opportunities for students to write their opinion, or claim, supported by reasons. Students answer questions (focus question, response sheets, assessments) by stating their claim supported by evidence and reasoning. Selected examples Inv 1, Part 2, Step 14 Inv 3, Part 3, Step 13; Inv 3, Part 4, Step 8 Inv 4, Part 1, Steps 7, 8; Inv 4, Part 3, Step 11
All investigations provide opportunities for students to write explanatory texts to examine the science topic they are learning. In every part, students write an explanation as part of their answer to the focus question or the response sheet. Selected examples Inv 1, Part 1, Steps 18, 21; Inv 1, Part 3, Step 10 Inv 1, Language Extension, Write organism booklets Inv 2, Part 1, Step 9; Inv 2, Part 2, Steps 12, 25 Inv 2, Part 3, Step 19; Inv 2, Part 4, Steps 15, 18 Inv 3, Part 3, Step 8 Inv 4, Part 2, Step 14 Students write a summary paragraph in the Wrap-up section at the end of every investigation.	All investigations provide opportunities for students to write explanatory texts to examine the science topic they are learning. In every part, students write an explanation as part of their answer to the focus question or the response sheet. Selected examples Inv 1, Part 2, Step 13; Inv 1, Part 3, Step 22 Inv 2, Part 1, Step 14; Inv 2, Part 2, Steps 7, 15; Part 4, Step 14 Inv 2, Language Extension, Write an investigation report Inv 3, Part 1, Step 18; Inv 3, Part 2, Steps 10-11 Inv 3, Part 4, Step 6 Students write a summary paragraph in the Wrap-up section at the end of every investigation.
All investigations provide opportunities for students to write narratives. Students describe their observations and experiences with the science ideas they are exploring. Selected example Inv 3, Part 1, Step 13	All investigations provide opportunities for students to write narratives. Students describe their observations and experiences with the science ideas they are exploring. Selected examples Inv 1, Part 3, Steps 4, 5 Inv 1, Language Extension. Write Soil Stories Inv 2, Part 2, Step 23; Inv 2, Part 3, Step 10 Inv 3, Language Extensions. Create maps of fictional places

WRITING STANDARDS (*continued*)

Production and Distribution of Writing

Standard	Energy Module
4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3.)	All investigations provide opportunities for students to record and organize their data in their science notebooks. Based on their data, students construct and write their explanations. Selected examples Inv 1, Part 1, Step 16; Inv 1, Part 2, Steps 22, 24; Inv 1, Part 3, Steps 11, 14, 30; Inv 1, Part 4, Step 10 Inv 2, Part 1, Step 17; Inv 2, Part 2, Steps 20, 22, 23; Inv 2, Part 3, Step 17; Inv 2, Language Extensions. Write directions for compass use Inv 3, Part 2, Step 11; Inv 3, Part 3, Step 12 Inv 4, Part 2, Step 14; Inv 4, Part 2, Step 19
5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 4.)	The Wrap-up/Warm-up section of each investigation part provides the opportunity for students to strengthen their notebook entries by revising and adding in new information. Inv 3, Part 1, Step 13 Inv 4, Part 2, Step 19 The Wrap-up review focus question section at the end of each investigation and next-step strategies after answering the response sheets or taking the I-Check also serve as a method for strengthening writing.
6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.	

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to record and organize their data in their science notebooks. Based on their data, students construct and write their explanations. Selected examples Inv 1, Part 1, Steps 18, 21; Inv 1, Part 2, Steps 19, 33; Inv 1, Part 3, Step 10 Inv 2, Part 1, Step 9; Inv 2, Part 2, Steps 12, 19; Inv 2, Part 4, Steps 14, 15, 18 Inv 3, Part 1, Step 13; Inv 3, Part 2, Step 13; Inv 3, Part 3, Steps 8, 10 Inv 4, Part 2, Steps 14, 15	All investigations provide opportunities for students to record and organize their data in their science notebooks. Based on their data, students construct and write their explanations. Selected examples Inv 1, Part 1, Step 16; Inv 1, Part 2, Steps 6, 8 Inv 2, Part 1, Step 14; Inv 2, Part 2, Steps 7, 13, 15, 20-21, 23; Inv 2, Part 3, Steps 4, 10; Inv 2, Part 3, Step 11; Inv 2, Part 4, Step 14 Inv 3, Part 1, Steps 18, 20; Inv 3, Part 2, Step 10; Inv 3, Part 3, Step 13; Inv 3, Part 4, Step 6 Inv 4, Part 1, Steps 7, 8; Inv 4, Part 3, Step 11
The Wrap-up/Warm-up section of each investigation part provides the opportunity for students to strengthen their notebook entries by revising and adding in new information. Inv 1, Part 1, Step 34 Inv 2, Part 1, Step 12; Inv 2, Part 3, Step 22; Inv 2, Part 4, Step 18 Inv 3, Part 2, Step 31 Inv 4, Part 1, Step 48 The Wrap-up review focus question section at the end of each investigation and next-step strategies after answering the response sheets or taking the I-Check also serve as a method for strengthening writing.	The Wrap-up/Warm-up section of each investigation part provides the opportunity for students to strengthen their notebook entries by revising and adding in new information. Inv 1, Part 1, Step 21 Inv 2, Part 1, Step 21; Inv 2, Part 2, Steps 20, 28; Inv 2, Part 4, Step 19 The Wrap-up review focus question section at the end of each investigation and next-step strategies after answering the response sheets or taking the I-Check also serve as a method for strengthening writing.

WRITING STANDARDS (*continued*)

	Standard	Energy Module
Research to Build and Present Knowledge	7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.	All investigations provide opportunities for students to further investigate different aspects of the science topic. Inv 1, Part 1, Step 21; Inv 1, Part 2, Step 12; Inv 1, Part 3, Steps 21, 22, 31; Inv 1, Language Extensions. Research solar cell technology Inv 2, Science and Engineering Extensions. Conduct more force investigations Inv 3, Language Extensions. Research forms of code. Investigate emergency codes Inv 4, Language Extensions. Research safety technologies. Research roller coasters
	8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	All investigations provide students with the opportunity to write about their science experiences and record their observations in their science notebooks. Students also take notes and organize information when reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Steps 15, 16, 20; Inv 1, Part 2, Steps 12, 16, 22, 24; Inv 1, Part 3, Steps 11, 14, 20, 22, 23, 26-28, 30 Inv 1, Part 4, Steps 6, 10 Inv 2, Part 1, Steps 11, 15, 17, 21, 25 Inv 2, Part 2, Steps 9, 11, 13, 20, 22, 23, 27 Inv 2, Part 3, Steps 6, 12, 14, 16, 21 Inv 3, Part 1, Steps 8, 10; Inv 3, Part 2, Steps 10, 11, 14 Inv 3, Part 3, Step 14 Inv 4, Part 1, Steps 5, 12, 14, 17; Inv 4, Part 2, Steps 14, 19 Inv 4, Part 3, Steps 8, 15, 25 Inv 5, Part 1, Step 17; Inv 5, Part 2, Step 20 Inv 5, Part 3, Step 21
Range of Writing	9. Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply *grade 4 Reading standards* to literature (e.g., "Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text [e.g., a character's thoughts, words, or actions]."). b. Apply *grade 4 Reading standards* to informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text").	All investigations provide opportunities to use the *FOSS Science Resources* as a source from which to draw evidence to support their ideas (e.g., discussion questions at the end of the articles). Selected examples Inv 1, Part 3, Step 30 Inv 2, Part 3, Step 23 Inv 3, Part 3, Step 15 Inv 4, Part 2, Step 19

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to further investigate different aspects of the science topic. Inv 1, Part 1, Steps 11, 12, 26; Inv 1, Part 2, Steps 6, 11, 17-19, 20-26, 30-33; Science and Engineering Extensions, Research pheromones Inv 2, Part 4, Step 18; Inv 2, Language Extension, Describe aquatic environments Inv 3, Part 2, Steps 20-22; Inv 3, Science Extension, Observe the life cycle of brine shrimp Inv 4, Part 1, Steps 9-12	All investigations provide opportunities for students to further investigate different aspects of the science topic. Inv 2, Part 2, Steps 13, 20-21 Inv 2, Part 3, Step 4; Inv 3, Science Extension, Find out what surveyors do Inv 4, Part 2, Step 11; Inv 4, Language Extension, Research natural resources in your region
All investigations provide students with the opportunity to write about their science experiences and record their observations in their science notebooks. Students also take notes and organize information when reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Steps 4, 12, 17, 19, 21; Inv 1, Part 2, Steps 9, 11, 15, 19, 28, 30, 33, 34; Inv 1, Part 3, Step 7; Inv 1, Part 3, Step 10 Inv 2, Part 1, Steps 1, 7, 9, 14, 20-23; Inv 2, Part 2, Step 12 Inv 2, Part 2, Steps 12, 18, 20, 22 Inv 2, Part 3, Steps 16, 17, 19; Inv 2, Part 3, Step 21 Inv 2, Part 4, Steps 14, 15, 18-20 Inv 3, Part 1, Steps 13, 15; Inv 3, Part 2, Steps 3, 5, 9, 16, 22, 26; Inv 3, Part 3, Step 8; Inv 3, Part 4, Step 16 Inv 4, Part 1, Steps 22, 28, 29, 32, 43, 47, 48 Inv 4, Part 2, Steps 14, 15; Inv 4, Part 3, Steps 3, 6	All investigations provide students with the opportunity to write about their science experiences and record their observations in their science notebooks. Students also take notes and organize information when reading articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Step 16; Inv 1, Part 2, Steps 6, 8 Inv 1, Part 3, Step 15; Inv 1, Part 4, Steps 9, 13, 15 Inv 2, Part 1, Steps 5, 14; Inv 2, Part 2, Steps 7, 13, 15, 20-21, 23; Inv 2, Part 3, Steps 4, 10; Part 4, Steps 14, 16, 20, 21 Inv 3, Part 1, Steps 18, 21; Inv 3, Part 2, Steps 10, 13, 14 Inv 3, Part 3, Steps 12, 13; Inv 3, Part 4, Steps 3, 4 Inv 3, Part 4, Steps 9, 11 Inv 4, Part 1, Step 2; Inv 4, Part 1, Steps 10, 1 Inv 4, Part 2, Step 10; Inv 4, Part 3, Steps 3-5, 8
All investigations provide opportunities to use the *FOSS Science Resources* as a source from which to draw evidence to support their ideas (e.g., discussion questions at the end of the articles). Selected examples Inv 1, Part 1, Steps 26, 34; Inv 1, Part 3, Step 14 Inv 2, Part 1, Steps 12, 23; Inv 2, Part 2, Steps 18, 20, 22 Inv 2, Part 3, Step 22; Inv 2, Part 4, Step 18 Inv 3, Part 1, Step 15; Inv 3, Part 2, Step 17; Inv 3, Part 4, Step 18	All investigations provide opportunities to use the *FOSS Science Resources* as a source from which to draw evidence to support their ideas (e.g., discussion questions at the end of the articles). Selected examples Inv 2, Part 4, Step 19

SPEAKING AND LISTENING STANDARDS

Comprehension and Collaboration

Standard	Energy Module
1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly. a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. b. Follow agreed-upon rules for discussions and carry out assigned roles. c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others. d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.	All investigations provide students ample opportunities to engage in a range of collaborative discussions. Students discuss before, during, and after the active investigation and during the Wrap-up/Warm-up section. Selected examples Inv 1, Part 1, Steps 9, 13, 16, 22, 23; Inv 1, Part 2, Steps 8, 13, 17-19, 24, 27; Inv 1, Part 3, Steps 1, 6, 7, 9, 14, 16, 17, 23, 31; Inv 1, Part 4, Step 4, 5, 7, 8 Inv 2, Part 1, Step 27; Inv 2, Part 2, Steps 10, 13, 15, 20, 30; Inv 2, Part 3, Steps 3-5, 11, 13 Inv 3, Part 1, Steps 10, 13, 20 Inv 3, Part 2, Steps 2, 9; Inv 3, Part 2, Step 17 Inv 3, Part 3, Step 18 Inv 4, Part 1, Step 10; Inv 4, Part 2, Steps 5, 7 Inv 4, Part 3, Steps 4, 10, 15 Discuss articles in *FOSS Science Resources* All investigations provide students with the opportunity to discuss the readings in pairs, small groups, and whole class. Selected examples Inv 1, Part 1, Step 21; Inv 1, Part 3, Steps 28, 29 Inv 1, Part 4, Step 13 Inv 2, Part 2, Step 26; Inv 2, Part 3, Step 20 Inv 3, Part 1, Step 19; Inv 3, Part 3, Steps 14, 15 Inv 4, Part 1, Step 15; Inv 4, Part 3, Step 19 Inv 5, Part 1, Step 20; Inv 5, Part 2, Steps 24, 27, 30
2. Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.	Discuss articles read aloud in *FOSS Science Resources* and online activities. Selected examples Inv 1, Part 1, Steps 15, 18 Inv 1, Part 2, Steps 21, 23; Inv 1, Part 4, Step 11 Inv 2, Part 1, Step 26; Inv 2, Part 2, Step 29 Inv 3, Part 1, Step 12; Inv 3, Part 2, Steps 12, 16 Inv 4, Part 3, Step 19 Video discussions Inv 2, Part 2, Step 28 Inv 4, Part 3, Step 26 Inv 5, Part 1, Step 15; Inv 5, Part 2, Step 18

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide students ample opportunities to engage in a range of collaborative discussions. Students discuss before, during, and after the active investigation and during the Wrap-up/Warm-up section. Selected examples Inv 1, Part 1, Steps 11; 34; Inv 1, Part 2, Step 6 Inv 2, Part 1, Steps 1, 11, 12, 16, 17, 25 Inv 2, Part 2, Steps 25-27; Inv 2, Part 3, Step 17 Inv 3, Part 1, Steps 4, 6, 9, 16; Inv 3, Part 2, Steps 10-12, 30-31; Inv 3, Part 3, Steps 4, 9, 16 Inv 4, Part 1, Steps 12, 17, 21, 39, 51; Inv 4, Part 2, Step 19 Discuss articles in *FOSS Science Resources* All investigations provide students with the opportunity to discuss the readings in pairs, small groups, and whole class. Selected examples Inv 1, Part 1, Steps 18, 33; Inv 1, Part 3, Step 14 Inv 2, Part 1, Step 23; Inv 2, Part 2, Steps 20-23 Inv 2, Part 3, Step 22; Inv 2, Part 4, Step 20 Inv 3, Part 1, Steps 14, 15; Inv 3, Part 2, Steps 9, 17 Inv 3, Part 3, Step 13; Inv 3, Part 4, Step 18 Inv 4, Part 1, Step 50; Inv 4, Part 2, Step 17	All investigations provide students ample opportunities to engage in a range of collaborative discussions. Students discuss before, during, and after the active investigation and during the Wrap-up/Warm-up section. Selected examples Inv 1, Part 1, Steps 7, 13, 17, 21; Inv 1, Part 2, Steps 3, 14, 15 Inv 1, Part 3, Steps 7, 8, 15, 16; Inv 1, Part 4, Steps 3, 14 Inv 2, Part 1, Step 7; Inv 2, Part 2, Steps 3, 16-21, 28 Inv 2, Part 3, Steps 9, 13; Part 4, Step 12 Inv 3, Part 1, Step 23; Inv 3, Part 2, Step 8 Inv 3, Part 3, Steps 1-3, 12, 14 Inv 4, Part 1, Steps 3, 15; Inv 4, Part 3, Steps 9-11 Discussing articles in *FOSS Science Resources* All investigations provide students with the opportunity to discuss the readings in pairs, small groups, and whole class. Selected examples Inv 1, Part 1, Steps 19-20; Inv 1, Part 3, Steps 20, 24 Inv 2, Part 1, Steps 20, 21; Inv 2, Part 4, Steps 18, 20, 22 Inv 4, Part 2, Step 16
Discuss articles read aloud in *FOSS Science Resources* and online activities. Selected examples Inv 1, Part 3, Step 13 Inv 2, Part 3, Step 26 Inv 3, Part 2, Steps 14, 29; Inv 3, Part 3, Step 15 Inv 3, Part 4, Step 18 Inv 4, Part 1, Step 46 Video discussions Inv 2, Part 4, Steps 13, 16 Inv 4, Part 3, Step 5	Discuss articles read aloud in *FOSS Science Resources* and online activities. Selected examples Inv 1, Part 1, Step 19; Inv 1, Part 3, Step 20 Inv 2, Part 1, Step 19; Inv 2, Part 4, Step 18 Video discussions Inv 1, Part 3, Step 23; Inv 1, Part 4, Step 16 Inv 2, Part 2, Steps 26, 27; Part 4, Steps 5, 6 Inv 3, Part 2, Step 16; Inv 3, Part 3, Steps 7, 11 Inv 4, Part 1, Steps 5, 14

SPEAKING AND LISTENING STANDARDS (*continued*)

	Standard	Energy Module
Comprehension and Collaboration	3. Identify the reasons and evidence a speaker provides to support particular points.	All investigations provide students with the opportunity to identify the reasons and evidence their peers and the teacher provide to support their ideas (e.g. students compare their responses to the focus question and the response sheets during the Wrap-up/Warm-up section). Selected examples Inv 1, Part 1, Step 10; Inv 1, Part 3, Steps 19, 20 Inv 4, Part 3, Step 19 Other opportunities arise when students present information to their group or the whole class.
Presentation of Knowledge and Ideas	4. Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.	All investigations provide students with the opportunity to report on their results. In the Wrap-up/Warm-up section students recount what they did in the investigation and share their answers to the focus question. Students report on what they learn from the text when discussing the articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Steps 1, 3, 7, 19; Inv 1, Part 2, Steps 1, 2, 6, 11, 26; Inv 1, Part 3, Steps 10, 29 Inv 1, Part 4, Steps 2, 8 Inv 2, Part 1, Steps 6, 7, 12, 16, 24; Inv 2, Part 2, Steps 3, 11, 14, 16; Inv 2, Part 3, Steps 1, 6, 16, 20 Inv 3, Part 1, Steps 3, 7; Inv 3, Part 2, Step 6 Inv 3, Part 3, Steps 6, 7, 14 Inv 4, Part 1, Steps 1, 5, 12; Inv 4, Part 2, Steps 4, 10 Inv 4, Part 3, Steps 5, 11, 17 Inv 5, Part 1, Step 9; Inv 5, Part 3, Steps 6, 7

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide students with the opportunity to identify the reasons and evidence their peers and the teacher provide to support their ideas (e.g., students compare their responses to the focus question and the response sheets during the Wrap-up/Warm-up section). Selected examples Inv 1, Part 1, Step 34 Inv 2, Part 3, Step 27 Inv 3, Part 2, Step 31; Inv 3, Part 3, Step 16 Inv 4, Part 2, Step 19 Other opportunities arise when students present information to their group or the whole class.	All investigations provide students with the opportunity to identify the reasons and evidence their peers and the teacher provide to support their ideas (e.g., students compare their responses to the focus question and the response sheets during the Wrap-up/Warm-up section). Selected examples Inv 1, Part 2, Steps 11, 15; Inv 1, Part 3, Step 20 Inv 2, Part 2, Step 28 Other opportunities arise when students present information to their group or the whole class.
All investigations provide students with the opportunity to report on their results. In the Wrap-up/Warm-up section students recount what they did in the investigation and share their answers to the focus question. Students report on what they learn from the text when discussing the articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 1, 5, 31, 32; Inv 1, Part 2, Steps 3, 4 Inv 1, Part 2, Steps 14-16, 27, 29, 31, 3 Inv 1, Part 3, Step 9 Inv 2, Part 1, Steps 2, 4, 7, 21; Inv 2, Part 2, Step 20 Inv 2, Part 3, Steps 1, 24, 25; Inv 2, Part 4, Steps, 1, 2, 10, 18, 20 Inv 3, Part 2, Steps 9, 15, 17; Inv 3, Part 3, Steps 1, 6 Inv 3, Part 4, Steps 1, 12, 14 Inv 4, Part 1, Steps 1, 3, 15, 30, 31, 33, 45 Inv 4, Part 2, Steps 1, 11, 12; Inv 4, Part 3, Step 1	All investigations provide students with the opportunity to report on their results. In the Wrap-up/Warm-up section students recount what they did in the investigation and share their answers to the focus question. Students report on what they learn from the text when discussing the articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 2, 3, 20; Inv 1, Part 2, Steps 4, 7 Inv 1, Part 3, Step 19; Inv 1, Part 4, Step 1 Inv 2, Part 1, Step 12; Inv 2, Part 3, Steps 1, 2, 7-9; Part 4, Steps 2, 3, 18 Inv 3, Part 1, Step 1; Inv 3, Part 2, Steps 13-15; Inv 3, Part 3, Steps 9, 12; Inv 3, Part 4, Step 5; Inv 3, Part 4, Steps 10, 11 Inv 4, Part 1, Steps 1, 9, 12, 13; Inv 4, Part 2, Steps 10, 11 Inv 4, Part 3, Step 1; Inv 4, Part 3, Steps 12, 14, 16

SPEAKING AND LISTENING STANDARDS (*continued*)

Presentation of Knowledge and Ideas

Standard	Energy Module
5. Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.	Inv 1, Part 2, Step 26; Inv 1, Part 3, Steps 18, 31; Inv 1, Language Extensions. Make a Poster Inv 2, Part 3, Steps 16, 20 Inv 3, Part 1, Step 19; Inv 3, Part 2, Step 16 Inv 4, Part 2, Step 19
6. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation. (See grade 4 Language standard 1 for specific expectations.)	All investigations provide students with situations in which they use either informal (small group discussions) or formal discourse structures and procedures (whole-group sharing). Protocols and sentence frames are provided for students who need support. Selected examples Inv 1, Part 2, Step 26 Inv 2, Part 2, Step 26 Inv 4, Part 2, Step 19

Environments Module	Soils, Rocks, and Landforms Module
Inv 2, Part 3, Step 27; Inv 2, Part 4, Step 18 Inv 3, Part 2, Step 13	Inv 2, Part 1, Step 20; Inv 2, Part 4, Step 18
All investigations provide students with situations in which they use either informal (small group discussions) or formal discourse structures and procedures (whole-group sharing). Protocols and sentence frames are provided for students who need support. Selected examples Inv 1, Part 2, Step 32 Inv 2, Part 2, Step 20; Inv 2, Part 4, Steps 18, 20 Inv 3, Part 2, Steps 13, 17	All investigations provide students with situations in which they use either informal (small group discussions) or formal discourse structures and procedures (whole-group sharing). Protocols and sentence frames are provided for students who need support. Selected examples Inv 1, Part 1, Steps 2-3, 20; Inv 1, Part 2, Steps 14, 15 Inv 2, Part 4, Step 18

LANGUAGE STANDARDS

	Standard	Energy Module
Conventions of Standard English	1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Use relative pronouns (*who, whose, whom, which, that*) and relative adverbs (*where, when, why*). b. Form and use the progressive (e.g., *I was walking; I am walking; I will be walking*) verb tenses. c. Use modal auxiliaries (e.g., *can, may, must*) to convey various conditions. d. Order adjectives within sentences according to conventional patterns (e.g., *a small red bag* rather than a *red small bag*). e. Form and use prepositional phrases. f. Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons. g. Correctly use frequently confused words (e.g., *to, too, two; there, their*).	All investigations provide opportunities for students to apply the conventions of English grammar when writing and speaking. Selected examples Inv 1, Part 1, Step 16; Inv 1, Part 2, Step 22 Inv 2, Part 3, Steps 7, 17 Inv 3, Part 2, Step 10 Inv 4, Part 2, Step 4; Inv 4, Part 3, Step 19
	2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use correct capitalization. b. Use commas and quotation marks to mark direct speech and quotations from a text. c. Use a comma before a coordinating conjunction in a compound sentence. d. Spell grade-appropriate words correctly, consulting references as needed.	All investigations provide opportunities for students to demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing in their science notebooks, response sheets, and the I-Checks.
Knowledge of Language	3. Use knowledge of language and its conventions when writing, speaking, reading, or listening. a. Choose words and phrases to convey ideas precisely. b. Choose punctuation for effect. c. Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion).	All investigations provide opportunities for students to use their knowledge of language and its conventions when writing in their science notebooks, discussing the investigation, and reading the articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 3, 23; Inv 1, Part 2, Step 22 Inv 2, Part 1, Step 27; Inv 2, Part 2, Step 26 Inv 2, Part 3, Step 17 Inv 3, Part 1, Step 19 Inv 4, Part 3, Step 25

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to apply the conventions of English grammar when writing and speaking. Selected examples Inv 1, Part 2, Step 19, 32; Inv 1, Part 3, Step 10 Inv 2, Part 1, Step 14; Inv 2, Part 2, Steps 12, 23 Inv 2, Part 3, Steps 17, 19; Inv 2, Part 4, Step 14 Inv 3, Part 2, Steps 3, 26, 30; Inv 3, Part 4, Step 18 Inv 4, Part 1, Steps 43, 47, 50; Inv 4, Part 2, Step 14	All investigations provide opportunities for students to apply the conventions of English grammar when writing and speaking. Selected examples Inv 1, Part 1, Step 16; Inv 1, Part 2, Steps 11, 13, 15 Inv 1, Part 3, Steps 19, 22 Inv 2, Part 1, Step 14; Inv 2, Part 2, Step Inv 2, Part 2, Steps 7, 15, 20, 23, 24 Inv 2, Part 3, Step 10; Inv 2, Part 4, Steps 14, 18 Inv 4, Part 1, Step 7; Inv 4, Part 2, Step 14
All investigations provide opportunities for students to demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing in their science notebooks, response sheets, and the I-Checks.	All investigations provide opportunities for students to demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing in their science notebooks, response sheets, and the I-Checks.
All investigations provide opportunities for students to use their knowledge of language and its conventions when writing in their science notebooks, discussing the investigation, and reading the articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 20, 21, 23; Inv 1, Part 2, Step 16 Inv 2, Part 2, Step 23; Inv 2, Part 3, Steps 17, 19, 20 Inv 3, Part 4, Step 18 Inv 4, Part 1, Steps 48, 50	All investigations provide opportunities for students to use their knowledge of language and its conventions when writing in their science notebooks, discussing the investigation, and reading the articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 2-3; Inv 1, Part 2, Steps 14, 15 Inv 2, Part 2, Steps 6, 28; Inv 2, Part 4, Step 18

LANGUAGE STANDARDS (*continued*)

Vocabulary Acquisition and Use

Standard	Energy Module
4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 4 reading and content*, choosing flexibly from a range of strategies. a. Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., *telegraph, photograph, autograph*). c. Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.	All investigations provide opportunities for students to determine or clarify meaning of academic and science-specific words and phrases while reading and discussing articles in *FOSS Science Resources*. Selected examples Inv 1, Part 1, Steps 19, 21 Inv 4, Part 3, Steps 21, 22, 25
5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Explain the meaning of simple similes and metaphors (e.g., *as pretty as a picture*) in context. b. Recognize and explain the meaning of common idioms, adages, and proverbs. c. Demonstrate understanding of words by relating them to their opposites (antonyms) and to words with similar but not identical meanings (synonyms).	Students learn the word relationships (e.g., concept maps) and nuances of certain words that have a specific meaning in science, such as **battery, cell, circuit, component, conductor, contact, electricity, energy, source, heat, light, motion, open, closed, switch, system, terminal, transfer, attract, compass, force, gravity, interact, pole, repel, induced, permanent, code, coil, core, key, predict, rivet, collide, friction, kinetic, potential, stationary, transfer, absorb, color, frequency, mirror, peak, ray reflect, troughs, transmit, wave**. Selected examples Inv 1, Part 2, Steps 24-25 Inv 1, Language Extensions. Name that insulator/ conductor Inv 4, Part 3, Step 25 Inv 5, Part 2, Step 30

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to determine or clarify meaning of academic and science-specific words and phrases while reading and discussing articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Steps 16-18 Inv 1, Part 2, Step 16 Inv 2, Part 1, Step 2 EL Note, Step 17 Inv 2, Part 2, Steps 1, 8, 18 Inv 2, Part 4, Steps 16-20 Inv 3, Part 1, Steps 14, 15, 25 Inv 4, Part 2, Step 17	All investigations provide opportunities for students to determine or clarify meaning of academic and science-specific words and phrases while reading and discussing articles in *FOSS Science Resources.* Selected examples Inv 1, Part 1, Step 19 Inv 2, Part 1, Step 8 Inv 4, Part 1, Step 11 Inv 4, Part 2, Step 11
Students learn the word relationships and nuances of certain words that have a specific meaning in science, such as **adult, behavior, condition, environment, factor, function, inference, living, nonliving, observation, organism, preferred, stage, structure, carrying capacity, competition, consumer, decomposer, ecosystem, energy, food chain, food web, home range, interaction, population, producer, mimicry, brine, concentration, inherited, trait, optimum, range, tolerance, reproduce, thrive, variation, adaptation, dominant, drought, distribution**. Selected examples Inv 1, Part 1, Step 27 Inv 2, Part 1, Steps 17, 21, 22 Inv 2, Part 2, Steps 7-10, 14, 18; Inv 2, Part 4, Step 18 Inv 4, Part 2, Step 17	Students learn the word relationships (e.g., concept maps) and nuances of certain words that have a specific meaning in science, such as **abrasion, acid, chemical reaction, weathering, conglomerate, expand, marble, system, soil, clay, humus, silt, sand, pebble, rock, basin, cast, delta, deposition, erosion, flood, fossil, imprint, meander, mold, slope, superposition, valley, contour, crust, elevation, lava, magma, mantle, profile, aggregate, cement, concrete, fuel, power, renewable, nonrenewable, resource, solar**. Selected examples Inv 1, Part 1, Step 19 Inv 1, Part 2, Step 8 Inv 1, Part 3, Step 16 Inv 1, Part 3, Step 21 Inv 2, Part 2, Step 1 Inv 4, Part 1, Step 2 Inv 4, Part 2, Step 13

LANGUAGE STANDARDS (*continued*)

Vocabulary Acquisition and Use

Standard	Energy Module
6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., *quizzed, whined, stammered*) and that are basic to a particular topic (e.g., *wildlife, conservation*, and *endangered* when discussing animal preservation).	All investigations provide opportunities for students to acquire and use conversational, academic, and science-specific words and phrases. Science vocabulary words are in bold when they are first introduced to students in *FOSS Science Resources.* Students also review the vocabulary in the Review vocabulary section for each part and the Wrap-up review vocabulary section of each investigation. Selected examples Inv 1, Parts 1-4, 8, 10, 11, 14, 16, 22 Inv 1, Part 2, Steps 1, 3, 6, 11, 12, 19, 21, 22, 27 Inv 1, Part 3, Steps 5, 12, 14, 19, 23, 25-27, 31 Inv 2, Part 1, Steps 3, 12, 13, 16, 17 Inv 2, Part 2, Steps 1, 3, 4, 6, 8, 12, 16, 17, 21-23 Inv 2, Part 3, Steps 1, 10 Inv 3, Part 1, Steps 4, 8, 10, 14, 15 Inv 3, Part 3, Steps 2, 10 Inv 4, Part 1, Steps 5, 16 Inv 4, Part 2, Steps 11, 13, 14, 19 Inv 4, Part 3, Steps 1, 2, 6, 13, 14 Inv 5, Part 1, Steps 1, 5, 10, 11, 16 Inv 5, Part 2, Steps 9, 15, 19 Inv 5, Part 3, Steps 2, 8

Environments Module	Soils, Rocks, and Landforms Module
All investigations provide opportunities for students to acquire and use conversational, academic, and science-specific words and phrases. Science vocabulary words are in bold when they are first introduced to students in *FOSS Science Resources*. Students also review the vocabulary in the Review vocabulary section for each part and the Wrap-up Review vocabulary section of each investigation. Selected examples Inv 1, Part 1, Steps 1, 9, 20, 21, 23, 24, 26, 27 Inv 1, Part 2, Steps 1, 3, 5, 14, 18, 32, 35-37 Inv 2, Part 1, Steps 2, 8, 15, 16-19, 23-25 Inv 2, Part 2, Steps 1, 3, 6-1 Inv 2, Part 3, Steps 2, 17-19 Inv 2, Part 4, Steps 18-20 Inv 3, Part 1, Steps 1, 2, 6, 12, 13 Inv 3, Part 3, Steps 2, 7 Inv 3, Part 4, Steps 1, 14-16 Inv 4, Part 1, Steps 39-43 Inv 4, Part 2, Steps 1, 11, 13, 14 Inv 4, Part 3, Step 1	All investigations provide opportunities for students to acquire and use conversational, academic, and science-specific words and phrases. Science vocabulary words are in bold when they are first introduced to students in *FOSS Science Resources*. Students also review the vocabulary in the Review vocabulary section for each part and the Wrap-up Review vocabulary section of each investigation. Selected examples Inv 1, Part 1, Steps 1, 8, 15, 16 Inv 1, Part 2, Steps 12-13 Inv 1, Part 3, Steps 3, 16, 21, 22 Inv 2, Part 1, Steps 1, 8-10, 13, 14, 21 Inv 2, Part 2, Steps 1, 6, 7, 14, 15, 28 Inv 2, Part 3, Step 1 Inv 2, Part 4, Steps 1-3, 5,6, 12-14 Inv 3, Part 1, Steps 2, 5, 8, 12, 13, 17, 18 Inv 3, Part 2, Steps 1, 9, 10, 17, 19 Inv 3, Part 4, Step 5 Inv 4, Part 1, Steps 3, 5, 7 Inv 4, Part 2, Steps 2, 4, 13, 14, 16