INTRODUCTION

All FOSS investigations follow a similar design to provide multiple exposures to science concepts. The design includes these pedagogies:

• Active investigation of important phenomena, including outdoor experiences
• Sense-making discussions
• Writing in science notebooks
• 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 literacy skills in science learning. Throughout the pedagogical design elements, students engage with the Common Core State Standards for English Language Arts, specifically the Standards for Literacy in Science and Technical Subjects.

This chapter gives an overview of how FOSS uses science to develop and apply these standards. On the following pages, a chart of the middle school FOSS courses identifies opportunities to address the grades 6–8 ELA standards. These standards are divided into categories:
• Reading—Literacy in Science and Technical Subjects (RST)
• Writing—Literacy in Science and Technical Subjects (WHST)
• Speaking and Listening (SL)
• Language (L)

Guiding Principles

When teaching science with FOSS and implementing the embedded language-arts integration, 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.

• The discipline of science possesses its own language, purposes, and ways of using text. To read science texts independently, students use sense-making skills and strategies particular to science. Reading in science involves appreciation of the quality of evidence used, attention to precision, and synthesizing complex information. Writing in science is a key means of asserting and defending claims, documenting ongoing learning, and reflecting on new ideas and questions. Students also learn to use the discipline-specific norms for science writing and presentations.

• Standards for Literacy in Science and Technical Subjects are integral to learning science content and engaging in science and engineering practices. Students obtain information from complex science texts related to their prior hands-on experience and knowledge.

• Students’ construction of knowledge happens through social interactions with you and with peers. They write explanatory texts, arguments to support claims, and data analysis. They engage in collaborative discussions about science and learn and practice new vocabulary and language structures in context of their investigations.

• Instruction is differentiated to meet the needs of all students. Linguistic accommodations for English learners support comprehensible input and accelerate academic language development. Language objectives for English learners in science instruction 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.

• Assessment makes students’ thinking visible and suggests next steps for instruction to develop and communicate science knowledge. Instruction includes formative assessment to measure progress and allows students to assess themselves and share feedback with peers.
In grades 6–8, students are capable of abstract and inferential thinking, and this is expressed in the language they use. Middle school students acquire vocabulary to describe concepts that cannot be directly observed, and develop models to explain and predict phenomena. FOSS middle school students use science and engineering practices to demonstrate their understanding of the core ideas. They apply language skills in comparing, determining cause and effect, evaluating information, making claims based on evidence, and solving problems.

**Instructional Flow**

Most investigations have a similar instructional flow. They provide these opportunities to integrate the grades 6–8 ELA standards.

- **When setting the context** for the lesson, students activate prior knowledge through class or small-group collaborative discussions, where they express their ideas and build on the ideas of others (SL 1).

- **During the active investigation**, students discuss their work with partners and in small groups. They present claims and findings based on their results (SL 4).

- **In the data management phase**, students make observations, and routinely record and organize data in their science notebooks (WHST 10). The notebook is a space for students to gather information from print and other media, evaluate the source for accuracy, and quote or paraphrase the data and conclusions of others (WHST 8). Students also acquire and use general academic and domain-specific words and phrases (L 6).

- **The analysis phase** involves discussing data, constructing and writing explanations, and making claims based on evidence and reasoning. Students make meaning by writing informative/explanatory texts (WHST 2), writing arguments (WHST 1), or conducting research projects to answer a question (WHST 7).

- **Reading** articles in *FOSS Science Resources* and other recommended readings provide many opportunities to address all the middle school reading standards for informational text (RST 1–10).

- **Assessment** tools and next-step strategies engage students in high-level critical thinking. They help students develop the Common Core State Standards capacities: demonstrating independence, building strong content knowledge, comprehending as well as critiquing, and valuing evidence.

We have provided some examples of how FOSS connects to the grades 6–8 ELA standards; many more opportunities can be created and explored by you and your students.
### READING STANDARDS FOR LITERACY IN SCIENCE

<table>
<thead>
<tr>
<th>Grades 6-8 Standards</th>
<th>Weather and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cite specific textual evidence to support analysis of science and technical texts.</td>
<td>Discuss and write about articles in FOSS Science Resources.</td>
</tr>
</tbody>
</table>
| Selected examples | Inv 1, Part 1, Step 8  
Inv 1, Part 3, Steps 8-9  
Inv 2, Part 1, Step 20  
Inv 3, Part 2, Steps 20-21  
Inv 5, Part 3, Steps 27-28  
Inv 6, Part 1, Steps 4-5  
Inv 6, Part 3, Steps 18-19  
Inv 8, Part 1, Step 18  
Inv 8, Part 2, Steps 4-5 |
| 2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. | Read, discuss, and write about articles in FOSS Science Resources. |
| Selected examples | Inv 1, Part 3, Steps 8-9  
Inv 2, Part 1, Steps 12-13  
Inv 3, Part 2, Steps 20-21  
Inv 6, Part 1, Steps 4-5  
Inv 6, Part 3, Steps 18-19  
Inv 7, Part 3, Step 25  
Inv 9, Part 2, Steps 15-16 |
| 3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. | All investigations provide opportunities for students to follow a multistep procedure. |
| Selected examples | Inv 4, Part 3, Steps 4-5  
Inv 5, Part 1, Steps 5-6  
Inv 5, Part 2, Steps 10-12 |
# Reading Standards for Literacy in Science and Technical Subjects

<table>
<thead>
<tr>
<th>Human Systems Interactions</th>
<th>Diversity of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss and write about articles in FOSS Science Resources.</td>
<td>Discuss and write about articles in FOSS Science Resources.</td>
</tr>
<tr>
<td>Selected examples</td>
<td>Selected examples</td>
</tr>
<tr>
<td>Inv 1, Part 2, Step 20</td>
<td>Inv 1, Part 2, Steps 31-32</td>
</tr>
<tr>
<td>Inv 2, Part 2, Steps 15-16</td>
<td>Inv 3, Part 4, Steps 10-11</td>
</tr>
<tr>
<td>Inv 3, Part 2, Steps 5-6; 18-19</td>
<td>Inv 4, Part 2, Steps 8-9</td>
</tr>
<tr>
<td>Inv 3, Part 3, Steps 6-7</td>
<td>Inv 5, Part 2, Step 23</td>
</tr>
<tr>
<td>Read, discuss, and write about articles in FOSS Science Resources.</td>
<td>Read, discuss, and write about articles in FOSS Science Resources.</td>
</tr>
<tr>
<td>Selected examples</td>
<td>Selected examples</td>
</tr>
<tr>
<td>Inv 1, Part 2, Steps 6-10</td>
<td>Inv 1, Part 2, Steps 31-32</td>
</tr>
<tr>
<td>Inv 1, Part 2, Step 19</td>
<td>Inv 2, Part 1, Step 19</td>
</tr>
<tr>
<td>Inv 2, Part 2, Steps 15-16</td>
<td>Inv 3, Part 4, Steps 10-11</td>
</tr>
<tr>
<td>All investigations provide opportunities for students to follow a multistep procedure.</td>
<td>All investigations provide opportunities for students to follow a multistep procedure.</td>
</tr>
<tr>
<td>Selected examples</td>
<td>Selected examples</td>
</tr>
<tr>
<td>Inv 2, Part 2, Steps 4-7</td>
<td>Inv 1, Part 2, Step 10</td>
</tr>
<tr>
<td>Inv 3, Part 3, Steps 13-14</td>
<td>Inv 2, Part 1, Step 7</td>
</tr>
<tr>
<td></td>
<td>Inv 2, Part 1, Step 10</td>
</tr>
<tr>
<td></td>
<td>Inv 2, Part 2, Step 8</td>
</tr>
<tr>
<td></td>
<td>Inv 2, Part 3, Step 3</td>
</tr>
<tr>
<td></td>
<td>Inv 3, Part 1, Step 3</td>
</tr>
<tr>
<td></td>
<td>Inv 3, Part 2, Step 4</td>
</tr>
</tbody>
</table>
### READING STANDARDS (CONT.)

<table>
<thead>
<tr>
<th>Grades 6-8 Standards</th>
<th>Weather and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>All investigations provide opportunities for students to determine the meaning of academic and science-specific words and phrases while reading.</td>
</tr>
<tr>
<td></td>
<td>Selected examples</td>
</tr>
<tr>
<td></td>
<td>Inv 1, Part 3, Steps 8-9</td>
</tr>
<tr>
<td></td>
<td>Inv 3, Part 1, Steps 12-13</td>
</tr>
<tr>
<td></td>
<td>Inv 6, Part 1, Steps 4-5</td>
</tr>
<tr>
<td></td>
<td>Inv 6, Part 3, Steps 18-19</td>
</tr>
<tr>
<td></td>
<td>Inv 8, Part 3, Steps 11-12</td>
</tr>
<tr>
<td></td>
<td>Inv 9, Part 2, Steps 15-16</td>
</tr>
<tr>
<td></td>
<td>Inv 10, Part 1, Step 13</td>
</tr>
<tr>
<td>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.</td>
<td>Read and discuss articles in FOSS Science Resources.</td>
</tr>
<tr>
<td></td>
<td>Selected examples</td>
</tr>
<tr>
<td></td>
<td>Inv 1, Part 3, Steps 8-9</td>
</tr>
<tr>
<td></td>
<td>Inv 2, Part 1, Steps 12-13</td>
</tr>
<tr>
<td></td>
<td>Inv 5, Part 3, Steps 27-28</td>
</tr>
<tr>
<td></td>
<td>Inv 8, Part 2, Steps 4-5</td>
</tr>
<tr>
<td></td>
<td>Inv 8, Part 3, Steps 11-12</td>
</tr>
<tr>
<td></td>
<td>Inv 9, Part 2, Steps 15-16</td>
</tr>
<tr>
<td>6. Determine an author’s point of view or purpose in a text and explain how it is conveyed in the text.</td>
<td>Discuss articles in FOSS Science Resources.</td>
</tr>
<tr>
<td></td>
<td>Selected examples</td>
</tr>
<tr>
<td></td>
<td>Inv 1, Part 3, Steps 8-9</td>
</tr>
<tr>
<td></td>
<td>Inv 2, Part 1, Steps 12-13</td>
</tr>
<tr>
<td></td>
<td>Inv 5, Part 3, Steps 27-28</td>
</tr>
<tr>
<td></td>
<td>Inv 6, Part 1, Steps 4-5</td>
</tr>
<tr>
<td></td>
<td>Inv 6, Part 3, Steps 18-19</td>
</tr>
<tr>
<td></td>
<td>Inv 8, Part 1, Steps 16-17</td>
</tr>
<tr>
<td></td>
<td>Inv 8, Part 2, Steps 4-5</td>
</tr>
</tbody>
</table>
## Reading Standards (Cont.)

### Grades 6-8 Standards

- **Human Systems Interactions**
  - All investigations provide opportunities for students to determine the meaning of academic and science-specific words and phrases while reading.
  - Selected examples:
    - Inv 1, Part 2, Steps 6-7
    - Inv 2, Part 2, Steps 15-16
    - Inv 3, Part 2, Steps 5-6
  - Read and discuss articles in FOSS Science Resources.
    - Selected examples:
      - Inv 1, Part 2, Steps 6-7
      - Inv 2, Part 1, Steps 12-13
      - Inv 5, Part 3, Steps 27-28
      - Inv 6, Part 1, Steps 4-5
      - Inv 6, Part 3, Steps 18-19
      - Inv 8, Part 2, Steps 4-5
      - Inv 9, Part 2, Steps 7-8
  - Discuss articles in FOSS Science Resources.
    - Selected examples:
      - Inv 1, Part 2, Steps 15-16
      - Inv 3, Part 2, Steps 5-6; 18-19

- **Diversity of Life**
  - All investigations provide opportunities for students to determine the meaning of academic and science-specific words and phrases while reading.
  - Selected examples:
    - Inv 1, Part 2, Steps 31-32
    - Inv 2, Part 1, Step 18
    - Inv 3, Part 4, Steps 10-11
    - Inv 4, Part 2, Steps 8-9
    - Inv 5, Part 3, Steps 10-11
    - Inv 6, Part 3, Step 14
    - Inv 7, Part 2, Steps 8-9
    - Inv 8, Part 1, Step 5
    - Inv 9, Part 2, Steps 7-8
  - Read and discuss articles in FOSS Science Resources.
    - Selected examples:
      - Inv 1, Part 2, Steps 31-32
      - Inv 8, Part 1, Steps 5, 14
  - Discuss articles in FOSS Science Resources.
    - Selected examples:
      - Inv 2, Part 2, Steps 15-16
      - Inv 8, Part 2, Steps 11-12
      - Inv 9, Part 1, Steps 3-4
## READING STANDARDS (CONT.)

<table>
<thead>
<tr>
<th>Grades 6-8 Standards</th>
<th>Weather and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>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).</td>
<td>Read and discuss articles in FOSS Science Resources.</td>
</tr>
<tr>
<td><strong>Selected examples</strong></td>
<td><strong>Selected examples</strong></td>
</tr>
<tr>
<td>Inv 1, Part 1, Step 8</td>
<td>Inv 1, Part 1, Step 8</td>
</tr>
<tr>
<td>Inv 2, Part 1, Steps 12-13</td>
<td>Inv 2, Part 1, Steps 12-13</td>
</tr>
<tr>
<td>Inv 3, Part 2, Steps 20-21</td>
<td>Inv 3, Part 2, Steps 20-21</td>
</tr>
<tr>
<td>Inv 3, Part 3, Step 15</td>
<td>Inv 3, Part 3, Step 15</td>
</tr>
<tr>
<td>Inv 5, Part 3, Steps 27-28</td>
<td>Inv 5, Part 3, Steps 27-28</td>
</tr>
<tr>
<td>Inv 6, Part 1, Steps 4-5</td>
<td>Inv 6, Part 1, Steps 4-5</td>
</tr>
<tr>
<td>Inv 6, Part 3, Steps 18-19</td>
<td>Inv 6, Part 3, Steps 18-19</td>
</tr>
<tr>
<td>Inv 8, Part 2, Steps 4-5</td>
<td>Inv 8, Part 2, Steps 4-5</td>
</tr>
<tr>
<td>Inv 8, Part 3, Steps 11-12</td>
<td>Inv 8, Part 3, Steps 11-12</td>
</tr>
<tr>
<td>Inv 9, Part 2, Steps 15-16</td>
<td>Inv 9, Part 2, Steps 15-16</td>
</tr>
<tr>
<td>Inv 10, Part 1, Step 7</td>
<td>Inv 10, Part 1, Step 7</td>
</tr>
</tbody>
</table>

8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. Read in FOSS Science Resources.

**Selected examples**
Inv 9, Part 2, Steps 15-16

9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. Compare and contrast readings in FOSS Science Resources to online simulations, streaming videos, and active investigations.

**Selected examples**
Inv 2, Part 1, Steps 12-13
Inv 3, Part 2, Steps 20-21
Inv 3, Part 3, Step 15
Inv 5, Part 3, Steps 27-28
Inv 6, Part 3, Steps 18-19
Inv 8, Part 1, Steps 16-17
Inv 8, Part 2, Steps 4-5
Inv 9, Part 2, Steps 15-16
## Human Systems Interactions

- Read and discuss articles in *FOSS Science Resources*.

  **Selected examples**
  - Inv 1, Part 2, Steps 6-7
  - Inv 2, Part 2, Steps 15-16
  - Inv 3, Part 2, Steps 5-6; 18-19
  - Inv 3, Part 3, Steps 6-7; 19-20
  - Inv 3, Part 4, Steps 15-16

## Diversity of Life

- Read and discuss articles in *FOSS Science Resources*.

  **Selected examples**
  - Inv 3, Part 4, Steps 19-20
  - Inv 4, Part 2, Steps 8-9
  - Inv 6, Part 2, Steps 16-17

---

**FOSS and Common Core ELA — Grade 6**
### Grades 6-8 Standards

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

### Weather and Water

All investigations provide opportunities for students to develop their ability to read and comprehend complex literary nonfiction text such as FOSS Science Resources.

Selected examples
- Inv 1, Part 1, Step 8
- Inv 1, Part 3, Steps 8-9
- Inv 2, Part 1, Steps 12-13
- Inv 3, Part 2, Steps 20-21
- Inv 3, Part 3, Step 15
- Inv 5, Part 3, Steps 27-28
- Inv 6, Part 1, Steps 4-5
- Inv 6, Part 3, Steps 18-19
- Inv 8, Part 1, Steps 16-17
- Inv 8, Part 2, Steps 4-5
- Inv 8, Part 3, Steps 11-12
- Inv 9, Part 2, Steps 15-16
<table>
<thead>
<tr>
<th>Human Systems Interactions</th>
<th>Diversity of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>All investigations provide opportunities for students to develop their ability to read and comprehend complex literary nonfiction text such as FOSS Science Resources.</td>
<td>All investigations provide opportunities for students to develop their ability to read and comprehend complex literary nonfiction text such as FOSS Science Resources.</td>
</tr>
<tr>
<td>Selected examples</td>
<td>Selected examples</td>
</tr>
<tr>
<td>Inv 1, Part 2, Steps 6-7</td>
<td>Inv 3, Part 2, Steps 24-25</td>
</tr>
<tr>
<td>Inv 3, Part 1, Steps 7-8</td>
<td>Inv 3, Part 4, Steps 10-11</td>
</tr>
<tr>
<td>Inv 3, Part 1, Step 21</td>
<td>Inv 4, Part 2, Steps 8-9</td>
</tr>
<tr>
<td>Inv 3, Part 2, Steps 5-6</td>
<td>Inv 5, Part 3, Steps 10-11</td>
</tr>
<tr>
<td>Inv 3, Part 2, Steps 24-25</td>
<td>Inv 7, Part 2, Steps 8-9</td>
</tr>
<tr>
<td>Inv 3, Part 4, Steps 10-11</td>
<td>Inv 8, Part 1, Step 5</td>
</tr>
<tr>
<td>Inv 4, Part 2, Steps 8-9</td>
<td>Inv 9, Part 1, Steps 3-4</td>
</tr>
</tbody>
</table>
## WRITING STANDARDS FOR LITERACY IN SCIENCE

### Grades 6–8 Standards

<table>
<thead>
<tr>
<th>Text Types and Purposes</th>
<th>Weather and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Write arguments focused on discipline-specific content.</td>
<td>All investigations provide opportunities for students to write claims supported by logical reasoning and evidence. (Examples include answering the focus questions, response sheet scenarios, and assessment items.)</td>
</tr>
<tr>
<td>a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.</td>
<td>Selected examples</td>
</tr>
<tr>
<td>b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.</td>
<td>Inv 1, Part 2, Step 21</td>
</tr>
<tr>
<td>c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.</td>
<td>Inv 2, Part 1, Step 19</td>
</tr>
<tr>
<td>d. Establish and maintain a formal style.</td>
<td>Inv 3, Part 2, Step 24</td>
</tr>
<tr>
<td>e. Provide a concluding statement or section that follows from and supports the argument presented.</td>
<td>Inv 5, Part 2, Step 18</td>
</tr>
<tr>
<td></td>
<td>Inv 7, Part 1, Steps 17-18</td>
</tr>
<tr>
<td>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</td>
<td>All investigations provide opportunities for students to write informative or explanatory texts that describe the scientific procedures and investigations they are conducting. Students write regularly in their notebooks and respond to formative assessment items to explain phenomena.</td>
</tr>
<tr>
<td>a. 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.</td>
<td>Selected examples</td>
</tr>
<tr>
<td>b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.</td>
<td>Inv 1, Part 2, Step 23</td>
</tr>
<tr>
<td>c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.</td>
<td>Inv 2, Part 2, Step 19</td>
</tr>
<tr>
<td>d. Use precise language and domain-specific vocabulary to inform about or explain the topic.</td>
<td>Inv 5, Part 1, Step 15</td>
</tr>
<tr>
<td>e. Establish and maintain a formal style and objective tone.</td>
<td>Inv 4, Part 1, Step 15</td>
</tr>
<tr>
<td>f. Provide a concluding statement or section that follows from and supports.</td>
<td>Inv 5, Part 2, Step 21</td>
</tr>
<tr>
<td></td>
<td>Inv 6, Part 3, Step 22</td>
</tr>
<tr>
<td></td>
<td>Inv 7, Part 2, Step 17</td>
</tr>
<tr>
<td></td>
<td>Inv 8, Part 2, Step 11</td>
</tr>
<tr>
<td></td>
<td>Inv 9, Part 3, Step 16</td>
</tr>
<tr>
<td></td>
<td>Inv 10, Part 1, Steps 2, 29</td>
</tr>
</tbody>
</table>
### AND TECHNICAL SUBJECTS

#### Human Systems Interactions

All investigations provide opportunities for students to write claims supported by logical reasoning and evidence. (Examples include answering the focus questions, response sheet scenarios, and assessment items.)

Selected examples
- Inv 1, Part 2, Steps 19-20
- Inv 2, Part 1, Step 18
- Inv 3, Part 1, Step 16
- Inv 3, Part 2, Step 17

#### Diversity of Life

All investigations provide opportunities for students to write claims supported by logical reasoning and evidence. (Examples include answering the focus questions, response sheet scenarios, and assessment items.)

Selected examples
- Inv 1, Part 1, Steps 23-24
- Inv 1, Part 2, Step 34
- Inv 4, Part 4, Steps 10-11
- Inv 5, Part 2, Step 22
- Inv 9, Part 2, Step 14

All investigations provide opportunities for students to write informative or explanatory texts that describe the scientific procedures and investigations they are conducting. Students write regularly in their notebooks and respond to formative assessment items to explain phenomena.

Selected examples
- Inv 1, Part 2, Step 23
- Inv 2, Part 2, Step 19
- Inv 3, Part 1, Step 19

All investigations provide opportunities for students to write informative or explanatory texts that describe the scientific procedures and investigations they are conducting. Students write regularly in their notebooks and respond to formative assessment items to explain phenomena.

Selected examples
- Inv 2, Part 1, Step 19
- Inv 5, Part 3, Step 14
- Inv 6, Part 1, Step 14
- Inv 6, Part 4, Steps 12-13
- Inv 7, Part 2, Step 16
### Writing Standards (Cont.)

<table>
<thead>
<tr>
<th>Grades 6-8 Standards</th>
<th>Weather and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.</strong> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</td>
<td>All investigations provide opportunities for students to record and organize data in their science notebooks. Based on their data, students construct and write their explanations.</td>
</tr>
</tbody>
</table>
| **Selected examples** | Inv 3, Part 2, Step 24  
Inv 4, Part 1, Step 15  
Inv 5, Part 3, Step 32  
Inv 6, Part 1, Step 8  
Inv 7, Part 2, Step 17  
Inv 7, Part 3, Step 20  
Inv 8, Part 1, Step 22  
Inv 8, Part 2, Step 11  
Inv 9, Part 3, Step 16  
Inv 10, Part 1, Step 28 |
| **5.** 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. | The Wrap-up/Warm-up section of each investigation part provides the opportunity for students to strengthen their notebook entries by revising and adding new information. Students also revise and refine their models based on feedback. |
| **Selected examples** | Inv 1, Part 2, Step 14  
Inv 1, Part 2, Step 26  
Inv 1, Part 3, Step 13  
Inv 3, Part 1, Step 17  
Inv 3, Part 2, Steps 20-21  
Inv 4, Part 2, Step 6  
Inv 5, Part 1, Steps 15, 21-22  
Inv 6, Part 1, Steps 1, 9  
Inv 8, Part 1, Step 25  
Inv 8, Part 2, Step 11  
Inv 9, Part 1, Step 18  
Inv 9, Part 2, Step 21 |
| **6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently. | Research projects suggested in Extensions provide opportunities to use technology to partially address this standard. |
### Writing Standards for Literacy in Science

#### Human Systems Interactions

All investigations provide opportunities for students to record and organize data in their science notebooks. Based on their data, students construct and write their explanations.

**Selected examples**
- Inv 1, Part 1, Step 13
- Inv 1, Part 2, Step 23
- Inv 2, Part 2, Step 19
- Inv 3, Part 1, Step 19
- Inv 3, Part 2, Step 21
- Inv 3, Part 3, Step 24

The Wrap-up/Warm-up section of each investigation part provides the opportunity for students to strengthen their notebook entries by revising and adding new information. Students also revise and refine their models based on feedback.

**Selected examples**
- Inv 1, Part 2, Step 14
- Inv 1, Part 2, Step 26
- Inv 1, Part 3, Step 13
- Inv 3, Part 1, Step 17
- Inv 3, Part 2, Steps 20-21
- Inv 4, Part 2, Step 6
- Inv 5, Part 1, Steps 15, 21-22
- Inv 6, Part 1, Steps 1, 9
- Inv 8, Part 1, Step 25
- Inv 8, Part 2, Step 11
- Inv 9, Part 1, Step 18
- Inv 9, Part 2, Step 21

Research projects suggested in Extensions provide opportunities to use technology to partially address this standard.

#### Diversity of Life

All investigations provide opportunities for students to record and organize data in their science notebooks. Based on their data, students construct and write their explanations.

**Selected examples**
- Inv 1, Part 1, Step 22
- Inv 2, Part 1, Step 16
- Inv 2, Part 2, Step 19
- Inv 3, Part 4, Step 9
- Inv 4, Part 2, Step 24
- Inv 4, Part 3, Step 18
- Inv 5, Part 1, Step 14
- Inv 5, Part 3, Step 13
- Inv 8, Part 1, Step 23
- Inv 9, Part 1, Step 27

The Wrap-up/Warm-up section of each investigation part provides the opportunity for students to strengthen their notebook entries by revising and adding new information. Students also revise and refine their models based on feedback.

**Selected examples**
- Inv 1, Part 2, Step 23
- Inv 2, Part 1, Step 22

Research projects suggested in Extensions provide opportunities to use technology to partially address this standard.
### WRITING STANDARDS (CONT.)

<table>
<thead>
<tr>
<th>Grades 6-8 Standards</th>
<th>Weather and Water</th>
</tr>
</thead>
</table>
| 7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. | Inv 5 Extensions  
Inv 6 Extensions  
Inv 8, Part 1, Steps 16-17 |
| 8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. | All investigations provide students with the opportunity to take notes from text and digital sources.  
Selected examples  
Inv 1, Part 1, Step 6  
Inv 1, Part 3, Steps 8-9; 10  
Inv 2, Part 1, Steps 12-13  
Inv 4, Part 2, Step 23  
Inv 4, Part 3, Step 20  
Inv 6, Part 3, Steps 17-18  
Inv 8, Part 2, Steps 4-5  
Inv 9, Part 2, Steps 6, 13 |
| 9. Draw evidence from informational texts to support analysis reflection, and research. | All investigations provide opportunities to use the FOSS Science Resources as a source from which to draw evidence to support their ideas (e.g., Think Questions at the end of the articles).  
Selected examples  
Inv 1, Part 3, Steps 8-9  
Inv 2, Part 1, Steps 12-13  
Inv 3, Part 2, Steps 20-21  
Inv 5, Part 3, Step 32  
Inv 6, Part 1, Steps 4-5  
Inv 8, Part 2, Steps 4-5 |
| 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. | All investigations require students to write regularly in their notebooks. |
### Writing Standards for Literacy in Science

<table>
<thead>
<tr>
<th>Human Systems Interactions</th>
<th>Diversity of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inv 1 Extensions</td>
<td>Inv 1 Extensions</td>
</tr>
<tr>
<td>Inv 2, Part 2, Steps 14-15</td>
<td>Inv 2 Extensions</td>
</tr>
<tr>
<td>Inv 2 Extensions</td>
<td>Inv 3 Extensions</td>
</tr>
<tr>
<td>Inv 3 Extensions</td>
<td>Inv 6 Extensions</td>
</tr>
<tr>
<td>Inv 3, Part 1, Steps 9-10</td>
<td>Inv 7 Extensions</td>
</tr>
<tr>
<td>Inv 3, Part 3, Step 27</td>
<td>Inv 8 Extensions</td>
</tr>
<tr>
<td></td>
<td>Inv 9 Extensions</td>
</tr>
</tbody>
</table>

1. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

2. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

All investigations provide students with the opportunity to take notes from text and digital sources.

Selected examples
- Inv 1, Part 1, Step 2
- Inv 1, Part 1, Step 14
- Inv 2, Part 2, Step 5
- Inv 2, Part 1, Step 12
- Inv 3, Part 1, Steps 7-10

All investigations provide students with the opportunity to use the FOSS Science Resources as a source from which to draw evidence to support their ideas (e.g., Think Questions at the end of the articles).

Selected examples
- Inv 3, Part 1, Step 21
- Inv 3, Part 2, Steps 5-6
- Inv 3, Part 4, Steps 15-16

All investigations require students to write regularly in their notebooks.

Selected examples
- Inv 3, Part 1, Step 21
- Inv 3, Part 2, Steps 5-6
- Inv 3, Part 4, Steps 15-16
## SPEAKING AND LISTENING STANDARDS

### Grades 6-8 Standards

1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

   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, Step 18
   - Inv 2, Part 1, Step 9
   - Inv 3, Part 1, Steps 2, 25
   - Inv 4, Part 3, Steps 3, 12
   - Inv 5, Part 2, Step 22
   - Inv 6, Part 1, Steps 1, 9
   - Inv 7, Part 2, Step 16
   - Inv 8, Part 1, Steps 16-17
   - Inv 9, Part 1, Step 18
   - Inv 10, Part 1, Step 27

2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

   Students evaluate and respond to each others' claims in class discussions.

   **Selected examples**
   - Inv 1, Part 1, Step 6
   - Inv 1, Part 2, Step 13
   - Inv 2, Part 1, Step 9
   - Inv 3, Part 3, Step 10
   - Inv 5, Part 1, Step 18
   - Inv 6, Part 3, Steps 1, 15
   - Inv 9, Part 3, Step 8

3. Delineate a speaker’s argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

   Students evaluate and respond to each others' claims in class discussions.

   **Selected examples**
   - Inv 2, Part 1, Steps 12-13
   - Inv 4, Part 2, Steps 6, 18
   - Inv 7, Part 1, Step 13
### Speaking and Listening Standards

**Human Systems Interactions**

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 2, Steps 6-7
- Inv 1, Part 2, Step 14
- Inv 3, Part 1, Steps 7-10
- Inv 3, Part 3, Steps 6-7
- Inv 3, Part 4, Steps 15-16

**Diversity of Life**

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 2, Steps 6, 23, 31-32
- Inv 3, Part 2, Steps 1, 13
- Inv 4, Part 1, Step 2
- Inv 4, Part 2, Steps 8-9
- Inv 5, Part 3, Step 4
- Inv 9, Part 2, Step 17

### Selected examples

- Inv 1, Part 1, Steps 4-7, 12-14
- Inv 1, Part 2, Steps 7-11
- Inv 2, Part 1, Steps 12-14
- Inv 3, Part 2, Steps 8-12
- Inv 3, Part 3, Steps 21
- Inv 2, Part 3, Step 10
- Inv 9, Part 1, Steps 3-4

- Inv 1, Part 2, Step 24
- Inv 3, Part 4, Steps 15-16
- Students evaluate and respond to each others’ claims in class discussions.

- Selected examples
  - Inv 1, Part 1, Step 12
  - Inv 3, Part 3, Step 13
  - Inv 9, Part 1, Steps 3-4
### SPEAKING AND LISTENING STANDARDS (CONT.)

<table>
<thead>
<tr>
<th>Grades 6-8 Standards</th>
<th>Weather and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.</td>
<td>Students present their claims and findings when discussing the results of investigations.</td>
</tr>
</tbody>
</table>
| Selected examples | Inv 1, Part 1, Step 11  
Inv 1, Part 2, Step 21  
Inv 2, Part 1, Steps 12-13  
Inv 2, Part 2, Step 7  
Inv 5, Part 1, Step 9  
Inv 6, Part 3, Steps 17-18  
Inv 7, Part 1, Step 3 |
| 5. Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information. | Inv 1, Part 3, Steps 8-9  
Inv 2, Part 1, Steps 12-13  
Inv 3, Part 1, Step 11  
Inv 4, Part 3, Step 15  
Inv 5, Part 1, Step 1 |
| 6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 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 1, Step 11  
Inv 7, Part 1, Step 13 |
| 3. Use knowledge of language and its conventions when writing, speaking, reading, or listening. | All investigations provide opportunities for students to use their knowledge of language and its conventions when writing in science notebooks, investigation discussions, and reading the articles in FOSS Science Resources. |
### Speaking and Listening Standards

#### Human Systems Interactions
- Students present their claims and findings when discussing the results of investigations.
  - Selected example
    - Inv 1, Part 2, Step 14
- Inv 2, Part 1, Steps 16-17

#### Diversity of Life
- Students present their claims and findings when discussing the results of investigations.
  - Selected examples
    - Inv 1, Part 1, Steps 23-24
    - Inv 3, Part 2, Step 9
    - Inv 5, Part 2, Step 13
    - Inv 9, Part 2, Steps 7-8
- Inv 5, Part 2, Step 22
- Inv 5, Part 3, Steps 10-11

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 2, Part 1, Step 22
  - Inv 3, Part 4, Steps 15-16

All investigations provide opportunities for students to use their knowledge of language and its conventions when writing in science notebooks, investigation discussions, and reading the articles in FOSS Science Resources.

- Selected examples
  - Inv 3, Part 4, Step 1
  - Inv 8, Part 1, Step 1

All investigations provide opportunities for students to use their knowledge of language and its conventions when writing in science notebooks, investigation discussions, and reading the articles in FOSS Science Resources.
## LANGUAGE STANDARDS

### Grades 6-8 Standards

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 6-8 reading and content, choosing flexibly from a range of strategies.

### Weather and Water

All investigations provide opportunities for students to determine or clarify the meaning of unknown and multiple-meaning words and phrases during class discussions and while reading and discussing articles in FOSS Science Resources.

Selected examples
- Inv 1, Part 2, Steps 23; 8-9
- Inv 3, Part 2, Step 24
- Inv 4, Part 1, Step 16
- Inv 5, Part 2, Step 21
- Inv 6, Part 1, Steps 4-5
- Inv 6, Part 2, Step 14
- Inv 6, Part 3, Step 22
- Inv 7, Part 2, Step 17
- Inv 8, Part 1, Step 20

5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

a. Interpret figures of speech (e.g., personification) in context.

Students learn the word relationships (e.g., concept maps) and nuances of certain words that have a specific meanings in science such as: **climate, pressure, particles, fluid, model, density, convection, radiation, conduction, energy, insulation, engineering problem, criteria, constraints, transpiration, precipitation, paleoclimatology, greenhouse gas, emission, pollutant, carbon sequestration**, and **greenhouse effect**.

Selected examples
- Inv 1, Part 2, Step 23
- Inv 1, Part 3, Steps 8-9
- Inv 2, Part 1, Steps 12-13
- Inv 3, Part 3, Step 13
- Inv 4, Part 1, Step 4
- Inv 4, Part 2, Step 22
- Inv 5, Part 1, Step 19
- Inv 5, Part 3, Step 32
- Inv 6, Part 1, Step 6
- Inv 7, Part 3, Step 18
- Inv 8, Part 3, Step 13
- Inv 10, Part 1, Steps 1, 28
## Language Standards

### Human Systems Interactions

All investigations provide opportunities for students to determine or clarify the meaning of unknown and multiple-meaning words and phrases during class discussions and while reading and discussing articles in FOSS Science Resources.

Selected examples
- Inv 1, Part 1, Step 3
- Inv 1, Part 1, Step 14
- Inv 3, Part 3, Steps 5-6

Students learn the word relationships (e.g., concept maps) and nuances of certain words that have a specific meanings in science such as: **cell, organ, tissue, calorie, memory, nerve, reaction, response, stimulus, and touch.**

Selected examples
- Inv 2, Part 2, Steps 14-15

### Diversity of Life

All investigations provide opportunities for students to determine or clarify the meaning of unknown and multiple-meaning words and phrases during class discussions and while reading and discussing articles in FOSS Science Resources.

Selected examples
- Inv 1, Part 1, Step 21
- Inv 1, Part 2, Steps 31-32
- Inv 3, Part 1, Step 18
- Inv 4, Part 1, Step 23
- Inv 5, Part 2, Steps 21-22
- Inv 6, Part 4, Step 11
- Inv 6, Part 2, Steps 13-14
- Inv 7, Part 2, Steps 8-9
- Inv 8, Part 1, Step 22

Students learn the word relationships (e.g., concept maps) and nuances of certain words that have a specific meanings in science such as: **dead, dormant, evidence, living, nonliving, organism, field of view, magnify, power, scales, cell, dormancy, atom, colony, control, culture, decomposer, domain, spore, organ, tissue, vein, adaptation, egg, fertilize, flower, seed, cross, feature, gene, population, trait, variation, behavior, function, structure, and virus.**

Selected examples
- Inv 4, Part 1, Step 23
- Inv 4, Part 2, Step 23
- Inv 5, Part 3, Step 12
6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

All investigations provide opportunities for students to acquire and use accurately academic and science-specific words and phrases. Science vocabulary words are in bold when they are first introduced in FOSS Science Resources. Students also review vocabulary in each part.

Selected examples
- Inv 1, Part 3, Steps 3; 8-9
- Inv 2, Part 1, Steps 12-13
- Inv 4, Part 2, Step 11
- Inv 4, Part 3, Step 19
- Inv 7, Part 1, Steps 17-18
- Inv 9, Part 2, Step 4
<table>
<thead>
<tr>
<th>Human Systems Interactions</th>
<th>Diversity of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All investigations provide opportunities for students to acquire and use accurately academic and science-specific words and phrases. Science vocabulary words are in bold when they are first introduced in FOSS Science Resources. Students also review vocabulary in each part.</strong></td>
<td><strong>All investigations provide opportunities for students to acquire and use accurately academic and science-specific words and phrases. Science vocabulary words are in bold when they are first introduced in FOSS Science Resources. Students also review vocabulary in each part.</strong></td>
</tr>
</tbody>
</table>