Supplemental Materials for Standard 2 - Earth and Space Science

The materials on the following pages are supplemental to the core. Each objective in Standard 2 has a sheet of information vital to student learning of science and the scientific processes inherent in the core. They are intended to give guidance to the teacher on the following topics:

- The Big Ideas go beyond discrete facts or skills to focus on larger concepts, principles, or processes (Grant Wiggins and Jay McTighe, *Understanding by Design*, 1998, p. 10). Big Ideas are cumulative, meaning that students revisit ideas that are previously developed, but in more and more complex ways at each successive grade level. This allows teachers to anchor learning at the beginning of the grade level to “concepts and reasoning abilities that young children bring with them” (NRC, 2008).

- Indicators provide both Measureable Outcomes framed by Standard 1 objectives and Big Ideas and measurable indicators of student content knowledge and scientific processing for teachers.

- Science language is the language that students should use when conversing on each objective within the standard. Students may not be expected to spell and read each and every term.

- Guidance for combining Content and Process are suggested strategies teachers may use to teach the core. One-letter abbreviations (L, M, A, S) are included to show how the science learning may be integrated into Language Arts, Mathematics, Arts, and Social Studies concepts. Science content should never be taught as content alone, but should be taught through the process of scientific practice, embedding content into inquiry, hands-on learning, experimentation, interpretation of evidence, and communication of findings. “When students engage in science as practice, they develop knowledge and explanations of the natural world as they generate and interpret evidence.” (*Ready, Set, Science: Putting Research to Work in K-8 Science Classrooms*, pg. 34)

- According to the National Science Education Standards, it is important to help students “establish connections between the natural and designed worlds.” Guidance for combining Science, Technology, and Society provide support to teachers in this area.

- A key for interpreting the abbreviations used in the supplementary materials is found at the bottom of the page.

**Important Note:** A guide for reading the supplementary materials is found in Appendix B.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Grade</th>
<th>Standard</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>Second</td>
<td>2. Earth and Space Science</td>
<td>1. Describe the characteristics of different rocks.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content Big Ideas</th>
<th>Standard 1 Big Ideas – Intended Learning Outcomes</th>
<th>Science, Technology, and Society Big Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>(E) Chunks of rocks come in many sizes and shapes, from boulders to grains of sand and even smaller.</td>
<td>(PoS) When science investigation is done the way it was done before, we expect to get a very similar result. (NoS) Sometimes people aren't sure what will happen because they don't know everything that might have an effect. (CoS) When doing science activities, it is often helpful to work with a team and to share findings with others. All team members should reach their own individual conclusions, however, about what the findings mean.</td>
<td>(T) People use appropriate tools and models to investigate the world. (A) People working alone or in groups often invent new ways to solve problems and get work done. (S) Students understand that the tools and ways of doing things that people have invented affect all aspects of life.</td>
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**Indicators: Measureable Outcomes framed by Standard 1 Big Ideas**

**Indicator 1.** Explain how smaller rocks come from the breakage and weathering of larger rocks.

**Indicator 2.** Describe rocks in terms of their parts (e.g. crystals, grains, cement).

**Indicator 3.** Sort rocks based upon color, hardness, texture, layering, particle size and type (i.e., igneous, metamorphic, sedimentary).

**Science language students should be able to use correctly:** characteristics, weathering, texture, layering, particle, data, conclusions, properties.

<table>
<thead>
<tr>
<th>Guidance for Combining Content and Process</th>
<th>Guidance for Combining Science, Technology, and Society</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suggested Strategies</strong></td>
<td>(T) The students can use magnifiers to help see things they could not see without them. (A) The students can identify how the properties of rocks determine how people use them. (S) The students can explain how rocks are used by people every day and evaluate the positive and negative impacts these uses have on society.</td>
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- **Earth and Space Science**
  - (E) Earth science
  - (SS) Space science

- **Curriculum Connections**
  - (M) Mathematics
  - (FA) Fine Arts
  - (L) Language Arts
  - (SS) Social Studies

- **Processes, Communication, and Nature of Science**
  - (PoS) Processes of science
  - (CoS) Communication of science
  - (NoS) Nature of science

- **Applications: Science, Technology, and Society**
  - (T) Tools of science
  - (A) Applications of science
  - (S) Implications of science for people