

## 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.

Subject	Grade	Standard	Objective
Science	First	2. Earth and Space Science	2. Observe and describe changes in the appearance of the sun and moon during daylight.
<b>Content Big Ideas</b>		<b>Standard 1 Big Ideas – Intended Learning Outcomes</b>	
<b>Science, Technology, and Society Big Ideas</b>			
(SS) The sun can be seen only in the daytime and the moon can be seen sometimes during the day.	(PoS) People can often learn about things around them by just observing those things carefully, but sometimes they can learn more by doing something to the things and noting what happens (raise questions about the world around them, be willing to seek answers to some of those questions by making careful observations and trying things out). (CoS) When doing science activities, it is often helpful to work with a team and to share findings with others. In this sharing, describing things as accurately as possible is important in science because it enables people to compare their observations with those of others (draw pictures that correctly portray at least some features of the thing being described, describe and compare things in terms of number, shape, texture, size, weight, color, and motion). (NoS) When people give different descriptions of the same thing, it is usually a good idea to make some fresh observations instead of just arguing about who is right.	(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) The tools and ways of doing things that people have invented affect all aspects of life.	
<b>Indicators: Measureable Outcomes framed by Standard 1 Big Ideas</b>			
Indicator 1. Observe the sun at different times during the day and report observations to peers. Indicator 2. Observe and chart the moon when it is visible during the day.			
Science language students should be able to use correctly: identify, record, shadow.			
<b>Guidance for Combining Content and Process</b>			<b>Guidance for Combining Science, Technology, and Society</b>
<b>Suggested Strategies</b> The students can observe the location of the sun at three different times each day during recess. Students can draw conclusions about the patterns and irregularities from their observations. Any observations made by students or groups that don't agree can be followed by continued observation. (L) (PoS) CoS) (NoS) The students can measure the size of their shadows during each recess and make comparisons between shadow measurements to sun locations charted earlier. (M) (PoS) Students can observe the moon over the period of four weeks. Students are empowered to decide what observations to make and chart the observations. During the sharing of observations, the teacher draws attention to the variety of the observations students made (shape, position, brightness, etc.). Students engage in a discussion about which observations were most useful in learning more about the moon. (M) (PoS) (CoS) NoS)			(T) Students can use age-appropriate tools to gather information about the sun and the moon. (A) Students can understand that the position of the sun correlates with the time of day. (S) Students can explain that people pattern their lives around the time of day.
<b>Earth and Space Science</b> (E) Earth science (SS) Space science	<b>Curriculum Connections</b> (M) Mathematics (L) Language Arts	<b>Processes, Communication, and Nature of Science</b> (FA) Fine Arts (SS) Social Studies	<b>Applications: Science, Technology, and Society</b> (T) Tools of science (A) Applications of science (S) Implications of science for people