

Supplemental Materials for Standard 4 – Life Science

The materials on the following pages are supplemental to the core. Each objective in Standard 4 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	4. Life Science	2. Observe how living things change and depend upon their environment to satisfy their basic needs.
Content Big Ideas		Standard 1 Big Ideas – Intended Learning Outcomes	
<p>(N) Most living things need water, food, and air.</p> <p>(N) Plants and animals need to take in water, and animals need to take in food. In addition, plants need light.</p> <p>(N) Animals eat plants and other animals for food.</p>		<p>(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).</p> <p>(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).</p> <p>(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.</p>	
Science, Technology, and Society Big Ideas			
<p>(T) People use appropriate tools and models to investigate the world.</p> <p>(A) People working alone or in groups often invent new ways to solve problems and get work done.</p> <p>(S) Students understand that tools and ways of doing things that people have invented affect all aspects of life.</p>			
Indicators: Measureable Outcomes framed by Standard 1 Big Ideas			
<p>Indicator 1. Make observations of living things and their environment using the five senses.</p> <p>Indicator 2. Identify how natural earth materials, e.g., food, water, air, light, and space, help to sustain plant and animal life.</p> <p>Indicator 3. Describe and model life cycles of living things.</p>			
<p>Science language students should be able to use correctly: life cycle, offspring, need, environment, investigate.</p>			
Guidance for Combining Content and Process			Guidance for Combining Science, Technology, and Society
<p>Suggested Strategies</p> <p>Students can conduct simple experiments/investigations related to plant needs by changing one variable at a time (food, air, water, light, or place to grow). (M) (PoS)</p> <p>Using various resources (e.g., books, movies, internet, live specimens) research the life cycle of living things such as butterflies, frogs, chickens, beans, and/or pumpkins. Students can then create their own representations of what they have learned. (L) (FA) (CoS)</p>			<p>(T) Students can use age-appropriate tools to investigate living things.</p> <p>(A) Students can explain that all living things follow a cycle.</p> <p>(S) Students understand that when basic needs are not met the life cycle is shortened.</p>
Life Sciences	Curriculum Connections		Processes, Communication, and Nature of Science
<p>(CT) Changes over time</p> <p>(N) Nature of Living Things</p>	<p>(M) Mathematics</p> <p>(L) Language Arts</p>	<p>(FA) Fine Arts</p> <p>(SS) Social Studies</p>	<p>(PoS) Processes of science</p> <p>(CoS) Communication of science</p> <p>(NoS) Nature of science</p>
Applications: Science, Technology, and Society			
<p>(T) Tools of science</p> <p>(A) Applications of science</p> <p>(S) Implications of science for people</p>			