

## 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	Second	4. Life Science	2. Identify basic needs of living things (plants and animals) and their abilities to meet their needs.
Content Big Ideas		Standard 1 Big Ideas – Intended Learning Outcomes	Science, Technology, and Society Big Ideas
<p>(N) Living things have parts that function to meet their basic needs.</p> <p>(N) Senses can warn individuals about danger; muscles help them to fight, hide, or get out of danger.</p> <p>(N) Living things not only need water, food, air, and waste removal, but also a particular range of temperatures in their environment.</p>		<p>(PoS) When science investigation is done the way it was done before, we expect to get a very similar result.</p> <p>(NoS) Sometimes people aren't sure what will happen because they don't know everything that might have an effect.</p> <p>(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.</p>	<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) The 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><b>Indicator 1. Communicate and justify how the physical characteristics of living things help them meet their basic needs.</b></p> <p><b>Indicator 2. Observe record and compare how the behaviors and reactions of living things help them meet their basic needs.</b></p> <p><b>Indicator 3. Identify behaviors and reactions of living things in response to changes in the environment including seasonal changes in temperature and precipitation.</b></p> <p><b>Science language students should be able to use correctly:</b> physical characteristics, behaviors, reaction, environment, seasonal, temperature, precipitation, migration, hibernation, dormancy.</p>			
Guidance for Combining Content and Process			Guidance for Combining Science, Technology, and Society
<p><b>Suggested Strategies</b></p> <p>Students can conduct a simple experiment (e.g., making predictions, gathering data, and drawing conclusions) to investigate how water is transported throughout a plant. Some examples could include: celery or carnations in colored water. Students share findings using diagrams, journals, charts, etc. (L) (FA) (M) (PoS) (CoS)</p> <p>Working in groups, students can compare and contrast the behaviors that animals use to meet their needs (i.e. feeding patterns, building nests, protections, communication). They can communicate and justify their conclusions in the form of class discussion, journals, posters, reports, etc. (L) (FA) (M) (PoS) (CoS) (NoS)</p> <p>Working in groups, students can compare and contrast the behaviors that plants use to meet their needs (i.e. growing towards the sunlight, flowers/nectar for pollination, seed dispersal methods, toxins). They can communicate and justify their conclusions in the form of class discussion, journals, posters, reports, etc. (L) (FA) (M) (PoS) (CoS) (NoS)</p> <p>Students can sort various plants and animals according to how they respond to seasonal changes in temperature and precipitation (example categories might include: hibernate, migrate, go dormant, die, other, etc.). Once the sort is completed, students can communicate and justify the placement of the various living things into their categories during a class discussion. (L) (PoS) (CoS) (NoS)</p>			<p>(T) Teachers can use the Internet to find pictures of plants and animals.</p> <p>(T) Students can use magnifiers to help see things they could not see without them.</p> <p>(T) Students can use instruments to help make observations about habitat components. For example, data can be collected from a fish tank to assess the environmental health (dissolved oxygen, pH, nitrogen content).</p> <p>(S) Students can discuss how their basic needs are met in their environment (i.e. air, food, water, waste removal, etc.).</p>
Life Sciences	Curriculum Connections		Processes, Communication and Nature of Science
(CT) Changes over time (N) Nature of Living Things	(M) Mathematics (L) Language Arts	(FA) Fine Arts (SS) Social Studies	(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