

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	K	4. Life Science	1. Investigate living things.
Content Big Ideas	Standard 1 Big Ideas – Intended Learning Outcomes		Science, Technology, and Society Big Ideas
(CT) Change is something that happens to many things. (CT) Some changes are so slow or so fast that they are hard to see.	(PoS) People can often learn about things around them by just observing those things carefully (raise questions about the world around them, be willing to seek answers to some of those questions by making careful observations). (NoS) People are more likely to believe your ideas if you can give reasons for them (ask “How do you know?” in appropriate situations and attempt reasonable answers when others ask them the same questions). (CoS) When doing science activities, it is often helpful to work with a team and to share findings with others.		(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.
Indicators: Measureable Outcomes framed by Standard 1 Big Ideas			
Indicator 1. Construct questions, give reasons, and share findings about living things. Indicator 2. Compare and contrast young plants and animals with their parents. Indicator 3. Describe some changes in plants and animals that are so slow or fast that they are hard to see, e.g., “slow” growth, seasonal change, “fast” blooming flower, hatching egg.			
Science language students should be able to use correctly: living vs. non-living things, change, grow.			
Guidance for Combining Content and Process			Guidance for Combining Science, Technology, and Society
Suggested Strategies Have students sort representations of or actual living and non-living things. Ask these and other related questions: (PoS) <ul style="list-style-type: none"> • Can you sort living and non-living things by observed characteristics of each item? (M) • How would you define an object as living? What are the characteristics that are similar between living things? Have students identify living things in their environment that change. Ask them to investigate the following questions (and others that you or your students choose): (PoS) (CoS) <ul style="list-style-type: none"> • How could you determine the change made in a plant? In an animal? Can you measure changes in organisms?(M) • Do plants and animals change as they grow? Describe the differences between a young plant/animal and an adult plant/animal. These differences could be shown in the form of a graph (M), a drawing (FA), or a written description (L). Allow the students to share their findings with other groups. Create a class chart showing the findings of each group (L). Compare described changes with changes that the students have observed in their environment. (PoS) (CoS) (NoS)			(T) Point out the various tools used while learning this objective. Examples of tools are a magnifying glass, ruler, camera, binoculars. (A) Discuss how through investigating living things we have been able to invent technology and understand environments required for living. (S) Show that society has benefited from the use of science in studying living and non-living things. Examples are wildlife conservation issues, needs of living things including medical applications and environmental concerns.
Life Sciences (CT) Changes over time (N) Nature of Living Things	Curriculum Connections (M) Mathematics (L) Language Arts	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