Supplemental Materials for Standard 3 – Physical Science

The materials on the following pages are supplemental to the core. Each objective in Standard 3 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 1objectives 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	3. Physical Science	2. Describe parts of non-living things.

Content Big Ideas	Standard 1 Big Ideas – Intended Learning Outcomes	Science, Technology, and Society Big Ideas
(A) Most things are made of parts.	(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. Describe how parts are used to build things and how things can be taken apart.
Indicator 2. Explain why things may not work the same if some of the parts are missing.

Science language students should be able to use correctly: part, whole.

Guidance for Combining Content and Process	Guidance for Combining Science, Technology, and Society
Suggested Strategies Have students identify the parts of a specific object or area. Ask them to investigate the following questions (and others that you and your students choose): (PoS) • What things turn a room into a classroom? Does a classroom look different than your bedroom? What objects make the two rooms different? (SS) • Are all things made of parts? What things around you are made of parts? (FA) • Point out that the students' body is made of parts. Have the students make a presentation about what would happen if parts were missing.(L) (CoS) Have students work as a team to build an item from parts (Lego building, puzzle): (M) (PoS) • What happens if one of the parts of your team is missing? Will your structure look the same if one of the parts is missing? Have the students work as a team to take an item apart: (PoS) • How does knowing the parts of an item help you to take it apart? Have students work in the sensory table to explore a whole and its parts. For example have the students build science bottles with corn syrup, oil, and water. Have the students 'filter' out a mixture of rocks, sand, and water. (PoS)	(T) Magnifiers, tools for putting things together and taking things apart, e.g., hammer, screwdrivers. (A) Automobiles, computers, houses and other things are made of parts. (S) Things can be repaired using parts.

Physical Science	Curriculum Connections		Processes, Communication, and Nature of Science	Applications: Science, Technology, and Society
(A) Atomic/Molecular	(M) Mathematics	(FA) Fine Arts	(PoS) Processes of science	(T) Tools of science
(F) Force and Motion	(L) Language Arts	(SS) Social Studies	(CoS) Communication of science	(A) Applications of science
			(NoS) Nature of science	(S) Implications of science for people