

Grade 5: Structure and Properties of Matter

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> <u>Nature of Science and Engineering</u> - Students will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research, and effectively communicate the research processes and conclusions. <u>Cause & Effect</u> - Students will demonstrate the ability to investigate, explain, and evaluate potential causal relationships by using evidence to support claims and predictions about the mechanisms that drive those relationships. <u>Scale, Proportion, and Quantity</u> - Students will demonstrate the ability to describe and represent the significance of changes in observable and non-observable phenomena in terms of relative scale, proportion, and quantity. <u>Content Standards:</u> 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. 5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. 5-PS1-3. Make observations and measurements to identify materials based on their properties. 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Transfer	
	Students will be able to independently use their learning to identify causal relationships as a means for explaining change.	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> - cause and effect relationships are routinely identified, tested, and used to explain change. - natural objects exist from the very small to the immensely large. - standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. - science assumes consistent patterns in natural systems.	ESSENTIAL QUESTIONS How do you know that something exists if you can't see it?
	Acquisition	
	<i>Students will know...</i> - that matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. - that a model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. - that the amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. - that measurements of a variety of properties can be used to identify materials. - that when two or more different substances are mixed, a new substance with different properties may be formed. - that no matter what reaction or change in properties occurs, the total weight of the substances does not	<i>Students will be skilled at...</i> - conducting an investigation to determine whether the mixing of two or more substances results in new substances. - making observations and measurements to identify materials based on their properties. - measuring and graphing quantities to provide evidence that regardless of the type of change, matter is conserved. - developing a model to describe that matter is made of particles too small to be seen.

	<i>change.</i> <i><u>vocabulary:</u> properties (color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility), chemical change, physical change, particles, atoms, substances, molecules, elements, Periodic Table</i>	
Content Area Literacy Standards		21st Century Skills
<i>not applicable</i>		• <i>solve problems</i> • <i>produce results</i> • <i>collaborate with others</i> • <i>think creatively</i>

Stage 2 - Evidence	
Evaluative Criteria	Assessment Evidence
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan	
Summary of Key Learning Events and Instruction	
Language Arts Integration	Mathematics Integration
• RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. • W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. • W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. • W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.	• MP.2 Reason abstractly and quantitatively. • MP.4 Model with mathematics. • MP.5 Use appropriate tools strategically. • 5.NBT.A.1 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. • 5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. • 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems. • 5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume

	measurement. • 5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
<i>Technology Integration</i>	<i>District Materials</i>