

MSAD #53 Science Curriculum Grade 6

Unifying Themes/Core Concepts Systems, Models, Constancy and Change, Scale

Student Learning Goals: *Students will understand that . . .*

- There is a relationship between the location and size of bodies within our solar system and throughout the universe, and these relationships affect cycles.
- Human actions affect short-term and long-term changes to the earth.
- Various forces affect motion.
- Earth’s history can be traced through fossils.

Skills and Processes of Science (MLR Standard B):		
The following skills and processes should permeate all scientific learning in the classroom and the field.		
Scientific Inquiry	Process Skills	Technological Design
<p>Students plan, conduct, analyze data from, and communicate results of investigations, including simple experiments.</p> <p>Students may . . .</p> <p>Identify questions that can be answered through scientific investigations.</p> <p>Design and safely conduct scientific investigations including experiments with controlled variables.</p> <p>Use appropriate tools, metric units, and techniques to gather, analyze, and interpret data.</p> <p>Use mathematics to gather, organize, and present data and structure convincing explanations.</p> <p>Use logic, critical reasoning and evidence to develop</p>	<p>Students will . . .</p> <p>Observe</p> <p>Classify & sequence</p> <p>Communicate</p> <p>Predict, hypothesize, & infer</p> <p>Define, control, & manipulate variables in experimentation</p> <p>Design, construct, & interpret models</p> <p>Interpret & analyze data</p> <p>Reflect on data & process; revise conclusions based on new evidence</p>	<p>Students use a systematic process, tools, equipment, and a variety of materials to design and produce a solution or product to meet a specified need, using established criteria.</p> <p>Students may . . .</p> <p>Identify appropriate problems for technological design.</p> <p>Design a solution or product.</p> <p>Communicate a proposed design using drawings and simple models.</p> <p>Implement a proposed design.</p> <p>Evaluate a completed design or product.</p> <p>Suggest improvements for their own and others’ designs and try out proposed modifications.</p>

<p>descriptions, explanations, predictions, and models.</p> <p>Communicate, critique, and analyze their own scientific work and the work of other students.</p>		<p>Explain the design process including the stages of problem identification, solution design, implementation, and evaluation.</p>
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Content & MLR Alignment	Skills: students will . . .	
<p>Universe & Solar System (D1)</p>	<p>Explain the movements and describe the location, composition, and characteristics of our solar system and universe, including planets, the sun, and galaxies.</p> <p>For example:</p> <p>Describe the different kinds of objects in the solar system including planets, sun, moons, asteroids, and comets.</p> <p>Explain the motions that cause days, years, phases of the moon, and eclipses.</p> <p>Describe the location of our solar system in its galaxy and explain that other galaxies exist and that they include stars and planets.</p>	<p><i>Astronomy</i> (Prentice Hall Science Explorers text)</p>
<p>Earth (D2)</p> <p>Earth Systems Weather Climate Renewable & Non-renewable Energy Weight/Gravity</p>	<p>Describe the various cycles, physical and biological forces and processes, position in space, energy transformations, and human actions that affect the short-term and long-term changes to the earth.</p> <p>For example:</p> <p>Explain how the tilt of Earth's rotational axis relative to the</p>	<p><i>Weather & Climate</i> (Prentice Hall Science Explorers text)</p>

	<p>plane of its yearly orbit around the sun affects the day length and sunlight intensity to cause seasons.</p> <p>Describe Earth Systems - biosphere, atmosphere, hydrosphere and lithosphere - and cycles and interactions within them (including water moving among and between them, rocks forming and transforming, and weather formation).</p> <p>Give several reasons why the climate is different in different regions of the Earth.</p> <p>Describe significant Earth resources and how their limited supply affects how they are used.</p> <p>Describe the effect of gravity on objects on Earth.</p> <p>Give examples of abrupt changes and slow changes in Earth Systems.</p>	
<p>Force & Motion (D4)</p> <p>Weight/Gravity Light Sound Structure of Eye and Ear Electricity Magnetism</p>	<p>Describe the force of gravity, the motion of objects, the properties of waves, and the wavelike property of energy in light waves.</p> <p>For example:</p> <p>Describe the similarities and differences in the motion of sound vibrations, earthquakes, and light waves.</p> <p>Explain the relationship among visible light, the electromagnetic spectrum, and sight.</p>	<p><i>Sound and Light</i> (Prentice Hall Science Explorers text)</p> <p><i>Inside Earth</i> (Prentice Hall Science Explorers text)</p> <p><i>Electricity and Magnetism</i> (Prentice Hall Science Explorers text)</p>

	Describe and apply an understanding of how electric currents and magnets can exert force on each other. (Build on previous concepts from 5 th grade).	
Evolution (E5) Fossils Earth's History	Explain how the earth has changed over time. Explain how the layers of sedimentary rock and their contained fossils provide evidence for the long history of Earth and for the long history of changing life.	<i>Inside Earth</i> (Prentice Hall Science Explorers text) Archaeology Unit

Interdisciplinary Connections:

English/Language Arts -- reading nonfiction; identifying & using features of nonfiction (e.g., diagrams, illustrations or photos, glossary, etc.); writing or drawing observations in science journals; orally presenting findings of investigations/experiments; participating in small and large group discussions about science.

Social Studies – Maine history; Maine fossil: *Pertica Quadrifaria*

Math – calendars; measurement; graphing

Core Science Instructional Strategies:

- Build & activate prior knowledge through read-alouds, videos, writing & discussion prompts, K-W-L; establish context with engaging scenarios.
- Develop vocabulary knowledge w/word walls, four square, list/group/label, concept definition mapping, and other activities involving concentrated word work.
- Establish purpose for reading or listening.
- Support reading comprehension through identification of nonfiction text features & their purposes.
- Map stories using the language of the scientific method.
- Use models, manipulative materials, and demonstrations to introduce and extend concepts.
- Take students into the field whenever possible.

- Structure scientific talk and argument using the features of the scientific method (asking questions, using evidence from research/experiments/observations, considering others' ideas, making predictions, drawing conclusions).
- Use science notebooks throughout a unit; have students record predictions, questions, observations, ideas, and reflections in words and images.

Differentiation Strategies:

- Multiple texts with varying readability levels;
- Partner reading;
- Read alouds;
- Flexible grouping and/or centers for labs & projects w/multiple roles;
- Modified rubrics;
- Choice in content, process, or product;
- Jigsaw sections of text or specific content

Essential Vocabulary:

Erosion
 Transport
 Deposit
 Rock Cycle
 Metamorphic
 Igneous
 Sedimentary
 Evolution
 Adaptation
 Extinction
 Fossil

Assessment:

NWEA – General Science, Concepts & Processes
 Unit Assessments