

MSAD #53 Science Curriculum Grade 5

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

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

- The movements of the earth, moon, and sun affect patterns and cycles on earth.
- Physical characteristics can be observed and measured, and physical change does not produce a new substance.
- Chemical changes produce new substances that do not retain the properties of the original substances.
- Various forces affect the motion of objects.
- The structure and functions of an organism affect itself and its environment.

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 fair tests.</p> <p><i>Students may . . .</i></p> <p>Pose investigable questions and seek answers from reliable sources of scientific information and from their own investigations.</p> <p>Plan and safely conduct investigations including simple experiments that involve a fair test.</p> <p>Use simple equipment, tools, and appropriate metric units of measurement to gather data and extend the senses.</p> <p>Use data to construct and support a reasonable explanation.</p> <p>Communicate scientific procedures and explanations.</p>	<p><i>Students will . . .</i></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 design process, simple tools, and a variety of materials to solve a problem or create a product, recognizing the constraints that need to be considered.</p> <p><i>Students may . . .</i></p> <p>Identify and explain a simple design problem and a solution related to the problem.</p> <p>Propose a solution to a design problem that recognizes constraints including cost, materials, time, space, or safety.</p> <p>Use appropriate tools, materials, safe techniques, and quantitative measurements to implement a proposed solution to design problem.</p> <p>Balance simple constraints in carrying out a proposed solution</p>

		<p>to a design problem.</p> <p>Evaluate their own design results, as well as those of others, using established criteria.</p> <p>Modify designs based on results of evaluations.</p> <p>Present the design problem, process, and design or solution using oral, written, and/or pictorial means of communication.</p>
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Content & MLR Alignment	Skills: students will . . .	Resources
The Universe & Solar System (D1)	<p>Show the locations of the sun, earth, moon, and planets and their orbits.</p> <p>Observe and report on observations that the sun appears to move across the sky in the same way everyday, but its path changes slowly over the seasons.</p> <p>Recognize that the sun is a star and is similar to other stars in the universe.</p>	<i>Astronomy</i> (Prentice Hall Science Explorers text)
Earth (D2)	<p>Explain the effects of the rotation of the earth on the day/night cycle, and how that cycle affects local temperature.</p> <p>Describe the various forms water takes in the air and how that relates to weather.</p> <p>Explain how wind, waves, water, and ice reshape the surface of the earth.</p>	<i>Earth's Changing Surface and Earth's Waters</i> (Prentice Hall Science Explorers texts)

	Explain how the substance called air surrounds things, takes up space, and its movement can be felt as wind.	
Matter & Energy (D3) Weight Physical Characteristics Physical Change Chemical Change (indicators that a chemical change has occurred, e.g., bubbles/gas, color, heat given off, odor) Parts to Whole Water Cycle	Describe how the weight of an object (physical property) compares to the sum of the weight of its parts. Describe properties of objects and materials before and after they undergo a change or interaction (physical change, e.g., kernel to popcorn, apple to juice, water to ice). Explain that the properties of a material may change but the total amount of material remains the same (physical or chemical change; beginning to introduce the concept of conservation of matter).	<i>Sound and Light</i> and <i>Earth's Water</i> (Prentice Hall Science Explorers texts) Physical and Chemical Change mini unit
Force & Motion (D4) Magnetism Speed Electricity Gravity Force (push/pull) Direction	Predict the effect of a given force on the motion of an object. Describe how fast things move by how long it takes them to go a certain distance. Describe the path of an object (i.e., straight, zig-zag, etc.) Explain how various forces affect the motion of objects. Give examples of how gravity, magnets, and electrically charged materials push and pull objects.	<i>Electricity and Magnetism</i> (Prentice Hall Science Explorers text) magnets electricity board pully
Biodiversity (E1) Classification Adaptations Life Cycles	Compare living things based on their behaviors, external features, and environmental needs.	<i>Animals</i> and <i>Environmental Science</i> (Prentice Hall Science Explorers texts)

<p>Unit: Biomes</p>	<p>Describe how living things can be sorted in many ways.</p> <p>Describe the changes and external features and behaviors of an organism during its life cycle.</p> <p>Be familiar with:</p> <ul style="list-style-type: none"> • Common biomes including forest, desert, tundra, grassland, polar, ocean, rainforest • Common life cycles including monarch butterfly, frog, grasshopper, dragonfly, salmon • Organisms commonly found in the biomes, for example: moose, vole, pine tree, eagle, raccoon (forest) • Simple food chains • Single-celled organisms including amoeba, paramecium, euglena 	
<p>Ecosystems (E2) Biomes Food Chains Habitat Life Cycle Decomposition Relationships Predation Symbiosis Competition Producers & Consumers Carnivores Herbivores Omnivores</p>	<p>Describe ways organisms depend upon, interact within, and change the living and nonliving environment as well as ways the environment affects organisms.</p> <p>Explain how changes in an organism’s habitat can influence its survival.</p> <p>Describe that organisms all over the earth live, die, and decay.</p> <p>Describe some of the ways in which organisms depend on one another (i.e., predator/prey, food chains/webs, animals dispersing seeds & pollen).</p>	<p><i>Environmental Science</i> (Prentice Hall Science Explorers text)</p> <p>Food Web activity Food Pyramid activity</p>

	<p>Explain how the food of most animals can be traced back to plants and how animals use food for energy and repair.</p> <p>Explain how organisms can affect the environment in different ways.</p>	
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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 –

Math –

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;

Essential Vocabulary (includes MEA terms):

Adaptation – structures, features, habits	Matter
Algae	Mixture
Ancestor	Moon
Balance	Motion
Biological Parent	Offspring
Biome	Omnivore
Biomes	Orbit
Carnivore	Organism
Celsius (all temperatures in degrees Celsius)	Path
Change (chemical and physical)	Phases
Compare (similarities and differences)	Photosynthesis
Conclude; conclusion	Physical Change
Condensation	Physical Characteristics
Data	Planet
Decay	Precipitation
Decomposition	Predator/Predation
Describe	Prey
Energy (light, sound, heat, sound)	Property
Environment	Provide the most likely
Erosion	Provide the one that best . . .
Evaporation	Record
Explain (process, similarities, differences)	Revolve
Extinct	Rotate, rotation
Food Chain	Solid
Force (push/pull)	Sort
Gas	Speed
Herbivore	Star
Identify	Symbiosis
Inherit	Vertebrate
Invertebrate	Water Cycle
Liquid	Weathering
List	Weight

Assessment:

MEA (required at end of grade 5)

NWEA – General Science; Concepts & Processes (optional)

Unit assessments