

Science 5 (1) - DRAFT

STRAND	SUBSTRAND	STANDARD	BENCHMARK	ESSENTIAL ELEMENTS	MATERIALS / RESOURCES	ASSESSMENTS
The Nature of Science and Engineering	The Practice of Science	Science is a way of knowing about the natural world, is done by individuals and groups, and is characterized by empirical criteria, logical argument and skeptical review.	<p>Explain why evidence, clear communication and skepticism is an essential part of doing science.</p> <p>Understand that because we expect science investigations that are done the same way to produce the same results, it is important to try to figure out why when they do not.</p> <p>Understand that sometimes there are different explanations for the same observations, which usually leads to making more observations to try to resolve the differences and determine which explanation is correct.</p> <p>Recognize the importance of accurate record keeping, openness to scrutiny and replication in building scientific knowledge that eventually becomes available to everyone in the world.</p> <p>Understand that different models can be used to represent the same thing.</p> <p>Provide examples of scientific investigations that take different forms based on the type of question asked: observing what things are like or what is happening somewhere; collecting specimens for analysis; doing experiments; or examining pre-existing data.</p>	<ul style="list-style-type: none"> • Complete science investigation • Observations in science • Accurate records build scientific knowledge • Collecting data • Analysis of data 	<ul style="list-style-type: none"> • Variables Foss Kit • Internet • Scott Foresman Science Textbook • Super Science News • Media 	<ul style="list-style-type: none"> • Variables Assessment • MCA Science Test
The Nature of Science and Engineering	The Practice of Science	Scientific inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations.	<p>Share, critique and analyze one's own observations and speculations and those of classmates.</p> <p>Refine and refocus broad and ill-defined questions so that they are answerable using a scientific investigation.</p> <p>Identify and collect relevant evidence, make systematic observations and accurate measurements, and identify and control variables in a scientific</p>	<ul style="list-style-type: none"> • Analyze observations • Inquiry Questioning • Variables 	<ul style="list-style-type: none"> • Variables Foss Kit • Computers • Media/Internet 	<ul style="list-style-type: none"> • Variables Assessment • MCA Science Test

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			<p>investigation.</p> <p>Use appropriate tools (including computers) and techniques (including mathematics and graphing) in gathering, analyzing and interpreting data.</p> <p>Support one's statements with scientifically acceptable evidence found in books, articles and databases, and identify the sources using conventional guidelines.</p>	<ul style="list-style-type: none"> • Interpret data • Scientific Evidence 	<ul style="list-style-type: none"> • Books 	
The Nature of Science and Engineering	Interactions Among Science, Engineering, Technology and Society	Men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry.	<p>Describe how science and engineering influence and are influenced by local traditions and beliefs.</p> <p>Compare and contrast the work of scientists and the work of engineers.</p>	<ul style="list-style-type: none"> • Science influenced by traditions • Scientists vs Engineers 	<ul style="list-style-type: none"> • Textbook Chapter 17 • Engineer classroom activity • Internet • Books 	<ul style="list-style-type: none"> • Unit Assessment • Venn Diagram • MCA Science Test
Physical Science	Motion	An object's motion is affected by forces and can be described by the object's speed and the direction it is moving.	<p>Demonstrate that there must be unbalanced forces to cause a change in the speed or direction of the motion of an object.</p> <p>Recognize that when the forces are balanced, the object remains at rest or continues to move at a constant speed in a straight line.</p> <p>Explain how applied forces, including gravity and friction, affect the motion of objects.</p> <p>Give examples of simple machines and describe how they change the input and output of forces and motion.</p>	<ul style="list-style-type: none"> • Forces • Motion • Gravity • Friction • Simple Machines 	<ul style="list-style-type: none"> • Textbook Chapter 13 • Science Stories • Super Science News Magazine • Internet • Levers and Pulley Foss Kit 	<ul style="list-style-type: none"> • Unit Assessment • Lever and Pulley Assessment • MCA Science Test
Earth Science	Earth Structure and Processes	The surface of the Earth changes. Some changes are due to slow	<p>Explain how, over time, rock weathers to form soil.</p> <p>Compare and contrast the features that form from slow processes (such as water</p>	<ul style="list-style-type: none"> • Earth Surface Changes • Weathering process 	<ul style="list-style-type: none"> • Textbook Chapter 9 • Dodge County Extension 	<ul style="list-style-type: none"> • Unit Assessment • Power Point on Biomes

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		processes and some changes are due to rapid processes.	eroding the earth surface to create valleys) with rapid processes (such as landslides and volcanic eruptions).	<ul style="list-style-type: none"> • Soil • Erosion 	<p>Program</p> <ul style="list-style-type: none"> • Computer 	<ul style="list-style-type: none"> • MCA Science Test
Earth Science	Human Interaction with Earth Systems	Human systems gather resources from the living and nonliving environment to meet the needs and wants of a population. Some resources are scarcer than others; some are renewable, some are not.	<p>Categorize energy resources and material resources into renewable and non-renewable.</p> <p>Identify natural resources that are found in Minnesota (for example, water, iron ore, granite quarries, sand and gravel, wind and forests).</p> <p>Give examples of how mineral and energy resources are obtained and processed to be used by human systems (for example, extraction of iron for steel, oil or coal for energy).</p> <p>Explain how naturally occurring materials may be processed and changed to modify their properties into more useful products.</p>	<ul style="list-style-type: none"> • Renewable Resources • Nonrenewable Resources • Minnesota natural resources • Natural resource changes • Natural Resource Products 	<ul style="list-style-type: none"> • Textbook Chapter 10 • United Streaming • Internet • Media • Super Science News Magazine 	<ul style="list-style-type: none"> • Unit Assessment • MCA Science Test
Earth Science	Human Interaction with Earth Systems	Human systems affect the Earth system; individual decisions can influence the severity of those effects.	Compare the impact of different individual decisions on natural systems (for example, choosing paper or plastic bags impacts landfills as well as ocean life cycles).	<ul style="list-style-type: none"> • Individual Impact on Natural Earth Systems 	<ul style="list-style-type: none"> • Textbook Chapter 10 • Internet • Media • Super Science News Magazine 	<ul style="list-style-type: none"> • Unit Assessment • Classroom Graph(i.e. Recycling)
Earth Science	Human Interaction with Earth Systems	Scientists use models to represent and communicate information about the Earth system.	<p>Make a map of where the student lives showing natural and human-made features.</p> <p>Examine different kinds of maps of the student's community and of Minnesota; use a map key to interpret symbols for the different kinds of maps (for example, city maps, aerial photos, regional maps, or online map resources).</p>	<ul style="list-style-type: none"> • Make a map • Map Interpretation 	<ul style="list-style-type: none"> • Landforms Foss Kit • Map materials • Science Stories • Media 	<ul style="list-style-type: none"> • Landforms Assessment • MCA Science Test
Life Science	Structure and Function of Living Systems	All plants and animals have a definite life cycle, body parts, and systems to perform specific	<p>Describe how plant and animal structures and their functions provide an advantage for survival in a given natural system.</p> <p>Use a simple key to identify common plants and animals using observable</p>	<ul style="list-style-type: none"> • Adaptations for survival • Identification key: Plants and 	<ul style="list-style-type: none"> • Textbook Chapters 1,4 & 6 • Nature Walk • Internet • Super Science 	<ul style="list-style-type: none"> • Unit Assessment • MCA Science Test

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		life functions.	physical characteristics, structures and behaviors.	Animals	News	
Life Science	Interdependence of Living Systems	Natural systems have many parts that interact to maintain success.	Describe a natural system in Minnesota in terms of the relationships among its parts (living and nonliving), as well as inputs and outputs. Explain what would happen to a system such as a wetland, prairie or garden if one of its parts were changed.	<ul style="list-style-type: none"> Ecosystems Changes in Ecosystems 	<ul style="list-style-type: none"> Textbook Chapter 5 & 6 Internet Media Super Science News 	<ul style="list-style-type: none"> Unit Assessment MCA Science Test
Life Science	Human Interactions with Living Systems	Humans change environments in ways that can be either beneficial or harmful to themselves and other organisms.	Describe a system such as a wetland, prairie or garden in terms of its parts (living and nonliving), as well as inputs and outputs that are influenced by humans. Give examples of beneficial and harmful human interaction with natural systems.	<ul style="list-style-type: none"> Various Ecosystems Human impact on Ecosystems 	<ul style="list-style-type: none"> Textbook Chapter 6 Nature Walk Internet Media 	<ul style="list-style-type: none"> Unit Assessment MCA Science Test