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Grade 5

correlated to the

Minnesota Academic Standards
Science Grade 5

Standards		Page Citations	
5.1. The Nature of Science and Engineering			
5.1.1. The Practice of Science			
5.1.1.1. 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.			
5.1.1.1.1	Explain why evidence, clear communication, accurate record keeping, replication by others, and openness to scrutiny are essential parts of doing science.	SE: Flipchart:	4–13, 17, 19, 24–35, 39–40, 55–56, 70–74, 79–80, 93–96, 283–284, 517–518 2, 6
5.1.1.1.2	Recognize that when scientific investigations are replicated they generally produce the same results, and when results differ significantly, it is important to investigate what may have caused such differences. *For example:* Measurement errors, equipment failures, or uncontrolled variables.	SE: Flipchart:	24–33, 38–40 4, 5
5.1.1.1.3	Understand that different explanations for the same observations usually lead to making more observations and trying to resolve the differences.	SE: Flipchart:	24–33, 38, 55–56, 283–284 4, 7, 9, 11
5.1.1.1.4	Understand that different models can be used to represent natural phenomena and these models have limitations about what they can explain. *For example:* Different kinds of maps of a region provide different information about the land surface.	SE: Flipchart:	24–35, 38, 357–358, 405–406, 445–446, 516–518 3, 4, 22, 42, 48, 53, 54, 55, 56, 58, 68

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5.1.1.2. Scientific inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations.			
5.1.1.2.1	Generate a scientific question and plan an appropriate scientific investigation, such as systematic observations, field studies, open-ended exploration or controlled experiments to answer the question.	SE: Flipchart:	4–13, 24–33, 55–56, 93–96, 167–168, 283–284, 321–322, 357–358, 405–406, 445–446, 483–484, 517–518, 595–596, 627–628, 665–666, 721–722 5, 7
5.1.1.2.2	Identify and collect relevant evidence, make systematic observations and accurate measurements, and identify variables in a scientific investigation.	SE: Flipchart:	4–11, 19, 24–33, 38–40, 42–52, 55–56, 79–80, 93–96, 167–168, 283–284, 321–322, 357–358, 445–446, 483–484, 517–518, 595–596, 665–666, 721–722 5, 6, 7, 33
5.1.1.2.3	Conduct or critique an experiment, noting when the experiment might not be fair because some of the things that might change the outcome are not kept the same, or that the experiment is not repeated enough times to provide valid results.	SE: Flipchart:	24–33, 38–40, 283–284, 321–322, 357–358, 483–484, 665–666, 721–722 4, 5
5.1.3. Interactions Among Science, Technology Engineering, Mathematics, and Society			
5.1.3.2. 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.			
5.1.3.2.1	Describe how science and engineering influence and are influenced by local traditions and beliefs. *For example:* Sustainable agriculture practices used by many cultures.	SE: Flipchart:	66–73, 78, 92, 319, 692 7, 8
5.1.3.4. Tools and mathematics help scientists and engineers see more, measure more accurately, and do things that they could not otherwise accomplish.			
5.1.3.4.1	Use appropriate tools and techniques in gathering, analyzing and interpreting data. *For example:* Spring scale, metric measurements, tables, mean/median/range, spreadsheets, and appropriate graphs.	SE: Flipchart:	17–19, 24–35, 42–52, 54, 64–73, 79–80, 87, 92–96, 283–284, 321–322, 342, 349, 357–358, 405–406, 445–446, 493, 517–518, 571, 595–596, 626–628, 665–666, 721–722 6, 8, 9, 10, 11, 13, 19, 33, 40, 59, 61
5.1.3.4.2	Create and analyze different kinds of maps of the student's community and of Minnesota. *For example:* Weather maps, city maps, aerial photos, regional maps or online map resources.	SE:	17–18, 503–504, 516

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5.2. Physical Science			
5.2.2. Motion			
5.2.2.1. An object's motion is affected by forces and can be described by the object's speed and the direction it is moving.			
5.2.2.1.1	Give examples of simple machines and demonstrate how they change the input and output of forces and motion.	SE: Flipchart:	593, 700–711, 714–716 76, 78
5.2.2.1.2	Identify the force that starts something moving or changes its speed or direction of motion. *For example:* Friction slows down a moving skateboard.	SE: Flipchart:	700–712, 714–716, 724–732 75, 76, 77, 78, 79
5.2.2.1.3	Demonstrate that a greater force on an object can produce a greater change in motion.	SE: Flipchart:	700–712, 714–716, 724–732 75, 76, 77, 78, 79
5.3. Earth and Space Science			
5.3.1. Earth Structure and Processes			
5.3.1.2. The surface of the Earth changes. Some changes are due to slow processes and some changes are due to rapid processes.			
5.3.1.2.1	Explain how, over time, rocks weather and combine with organic matter to form soil.	SE: Flipchart:	366–377 48
5.3.1.2.2	Explain how slow processes, such as water erosion, and rapid processes, such as landslides and volcanic eruptions, form features of the Earth's surface.	SE: Flipchart:	366–377, 394–395, 398–399, 433, 475, 498–499, 512–513 39, 41, 42, 43
5.3.4. Human Interaction with Earth Systems			
5.3.4.1. In order to maintain and improve their existence, humans interact with and influence Earth systems.			
5.3.4.1.1	Identify renewable and non-renewable energy and material resources that are found in Minnesota and describe how they are used. *For example:* Water, iron ore, granite, sand and gravel, wind and forests.	SE: Flipchart:	330–335, 340–342, 346–351, 355 35, 37, 38

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5.3.4.1.2	Give examples of how mineral and energy resources are obtained and processed and how that processing modifies their properties to make them more useful. *For example:* Iron ore, biofuels, or coal.	SE: Flipchart:	330–335, 340–342, 346–351, 355, 456, 506–507, 592–599, 604–606, 620 35, 37, 38, 44, 45
5.3.4.1.3	Compare the impact of individual decisions on natural systems. *For example:* Choosing paper or plastic bags impacts landfills as well as ocean life cycles.	SE: Flipchart:	255, 272–273, 336–337, 344–351, 354 36, 37, 38
5.4. Life Science			
5.4.1. Structure and Function in Living Systems			
5.4.1.1. Living things are diverse with many different characteristics that enable them to grow, reproduce and survive.			
5.4.1.1.1	Describe how plant and animal structures and their functions provide an advantage for survival in a given natural system. *For example:* Compare the physical characteristics of plants or animals from widely different environments, such as desert versus tropical, and explore how each has adapted to its environment.	SE: Flipchart:	106–107, 178–184, 192–200, 210–215, 226–236, 521–526 19, 20, 21, 22, 24, 25, 31, 57
5.4.2. Interdependence Among Living Systems			
5.4.2.1. Natural systems have many parts that interact to maintain the living system.			
5.4.2.1.1	Describe a natural system in Minnesota, such as a wetland, prairie or garden, in terms of the relationships among its living and nonliving parts, as well as inputs and outputs. *For example:* Design and construct a habitat for a living organism that meets its need for food, air and water.	SE: Flipchart:	207–208, 225–240, 248–255, 300–301, 521–526 23, 25, 26, 27, 29, 31, 32, 33, 34, 57
5.4.2.1.2	Explain what would happen to a system such as a wetland, prairie or garden if one of its parts were changed. *For example:* Investigate how road salt runoff affects plants, insects and other parts of an ecosystem. *Another example:* Investigate how an invasive species changes an ecosystem.	SE: Flipchart:	207–208, 225–240, 264–275, 300–301, 313 23, 25, 26, 28, 30

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5.4.4. Human Interactions with Living Systems		
5.4.4.1. Humans change environments in ways that can be either beneficial or harmful to themselves and other organisms.		
5.4.4.1.1	Give examples of beneficial and harmful human interaction with natural systems. *For example:* Recreation, pollution, or wildlife management.	SE: 223–224, 255, 272–273, 336–337, 340 Flipchart: 35, 36, 37