Minnesota Science

Grade 4

Adopted 2019

Grade 4

Physical Science

1. Asking questions and defining problems. 4P.1.1
    1. Students will be able to ask questions about aspects of the phenomena they observe, the conclusions they draw from their models or scientific investigations, each other's ideas, and the information they read. 4P.1.1.1
        1. Ask questions to determine cause and effect relationships of electric and magnetic interactions between two objects not in contact with each other. 4P.1.1.1.1
    2. Students will be able to ask questions about a problem to be solved so they can define constraints and specifications for possible solutions. 44P.1.1.2
        1. Define a simple design problem that can be solved by applying scientific ideas about magnets. 4P.1.1.2.1

Earth and Space Science

1. Asking questions and defining problems. 4E.1.1
    1. Students will be able to ask questions about aspects of the phenomena they observe, the conclusions they draw from their models or scientific investigations, each other's ideas, and the information they read. 4E.1.1.1
        2. Ask questions about how water moves through the Earth system and identify the type of question. 4E.1.1.1.2
2. Planning and carrying out investigations. E.1.2
    1. Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions, and will organize and collect data to provide evidence to support claims the students make about phenomena. 4E.1.2.1
        1. Make observations and measurements to provide evidence of the effects of weathering or the rate of erosion by the forces of water, ice, wind, or vegetation. 4E.1.2.1.1
        2. Plan and carry out fair tests in which variables are controlled and failure points are considered to improve a model or prototype to prevent erosion. 4E.1.2.1.2
2. Using mathematics and computational thinking. 4E.2.2
    1. Students will be able to use mathematics to represent physical variables and their relationships; compare mathematical expressions to the real world; and engage in computational thinking as they use or develop algorithms to describe the natural or designed worlds. 4E.2.2.1
        1. Interpret charts, maps and/or graphs of the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. 4E.2.2.1.1
1. Developing and using models. 4E.3.1
    1. Students will be able to develop, revise, and use models to represent the students' understanding of phenomena or systems as they develop questions, predictions and/or explanations, and communicate ideas to others. 4E.3.1.1
        1. Develop a model based in part on student observations or data to describe ways the geosphere, biosphere, hydrosphere, and atmosphere interact. 4E.3.1.1.1
2. Constructing explanations and designing solutions. 4E.3.2
    1. Students will be able to apply scientific principles and empirical evidence (primary or secondary) to explain the causes of phenomena or identify weaknesses in explanations developed by the students or others. 4E.3.2.1
        1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. 4E.3.2.1.1
    2. Students will be able to use their understanding of scientific principles and the engineering design process to design solutions that meet established criteria and

constraints. 4E.3.2.2

1. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. 4E.3.2.2.1

2. Obtaining, evaluating and communicating information. 4E.4.2

    1. Students will be able to read and interpret multiple sources to obtain information, evaluate the merit and validity of claims and design solutions, and communicate information, ideas, and evidence in a variety of formats. 4E.4.2.1

        1. Read and comprehend grade appropriate complex texts and/or other reliable media to describe that energy and fuels are derived from natural resources and their uses affect the environment. 4E.4.2.1.1

    2. Students will be able to gather information about and communicate the methods that are used by various cultures, especially those of Minnesota American Indian Tribes and communities, to develop explanations of phenomena and design solutions to problems. 4E.4.2.2

        1. Obtain and combine multiple sources of information about ways individual communities, including Minnesota American Indian Tribes and communities and other cultures, use evidence and scientific principles to make decisions about the uses of Earth's resources. 4E.4.2.2.1

Life Science

1. Engaging in argument from evidence. 4L.4.1

    1. Students will be able to engage in argument from evidence for the explanations the students construct, defend and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counterarguments. 4L.4.1.1

        1. Construct or support an argument that traits can be influenced by different environments. 4L.4.1.1.1

2. Obtaining, evaluating and communicating information. 4L.4.2

    1. Students will be able to read and interpret multiple sources to obtain information, evaluate the merit and validity of claims and design solutions, and communicate information, ideas, and evidence in a variety of formats. 4L.4.2.1

        2. Obtain information from various media sources to determine that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. 4L.4.2.1.2