Montana Science Model Curriculum Guide by Grade Level: Grade 3

September 2016

Montana
Office of Public Instruction
opi.mt.gov Elsie Arntzen, Superintendent

Contents

The OPI is committed to providing reasonable accommodations to people with disabilities. If you need a reasonable accommodation, require an alternate format, or have questions concerning accessibility, contact the OPI ADA Coordinator, 406-444-3161, opiada@mt.gov, TTY 406-444-0235.

Resources	Three Dimensions		
	Disciplinary Core Ideas (DCI's)	Science and Engineering Practices (SEP's)	Crosscutting Concepts (CCC's)
Paul Anderson Videos: Details on each component of the standards Next Generation Science Standards (NGSS) at National Science Teachers Association (NSTA) Hub: Detailed explanations of the three dimensions, videos of what it looks like in the classroom, curriculum guidance, and classroom resources Evidence Statements: Observations of what students should know and be able to do when they perform the standard. Helpful for formative and summative assessments The Framework: The framework for Montana Science Standards and for the Next Generation Science Standards NGSS Storylines: These storylines explain questions that students should investigating and how by grade level; they paint the big picture of the big ideas STEM Teacher Tools: This site has every resource necessary to implement the new standards *Read more about the three dimensions in the NRC Framework online here (NGSS for States, By States)*	Disciplinary core ideas have the power to focus K–12 science curriculum, instruction and assessments on the most important aspects of science. To be considered core, the ideas should meet at least two of the following criteria and ideally all four: • Have broad importance across multiple sciences or engineering disciplines or be a key organizing concept of a single discipline; • Provide a key tool for understanding or investigating more complex ideas and solving problems; • Relate to the interests and life experiences of students or be connected to societal or personal concerns that require scientific or technological knowledge; • Be teachable and learnable over multiple grades at increasing levels of depth and sophistication. Disciplinary ideas are grouped in four domains: the physical sciences; the life sciences; the earth and space sciences; and engineering, technology and applications of science .	The practices describe behaviors that scientists engage in as they investigate and build models and theories about the natural world and the key set of engineering practices that engineers use as they design and build models and systems. The National Research Council (NRC) uses the term practices instead of a term like "skills" to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice. Part of the NRC's intent is to better explain and extend what is meant by "inquiry" in science and the range of cognitive, social, and physical practices that it requires. Although engineering design is similar to scientific inquiry, there are significant differences. For example, scientific inquiry involves the formulation of a question that can be answered through investigation, while engineering design involves the formulation of a problem that can be solved through design. Strengthening the engineering aspects of the Next Generation Science Standards will clarify for students the relevance of science, technology, engineering and mathematics (the four STEM fields) to everyday life. (NGSS for States, By States).	Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science. They include: Patterns, similarity, and diversity; Cause and effect; Scale, proportion and quantity; Systems and system models; Energy and matter; Structure and function; Stability and change. The Framework emphasizes that these concepts need to be made explicit for students because they provide an organizational schema for interrelating knowledge from various science fields into a coherent and scientifically-based view of the world. (NGSS for States, By States)

Grade 3 Physical Science

Montana Standard *Students must know and be able to:*	Disciplinary Core Ideas (DCI's)	Science and Engineering Practices (SEP's)	Crosscutting Concepts (CCC's)
plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object 3-PS2-1. NGSS Identifier	PS2.A	Planning and carrying out investigations	Cause and effect
observe and record qualitative and quantitative data about an object's motion to provide evidence that a pattern can be used to predict future motion 3-PS2-2. NGSS Identifier	PS2.A	Planning and carrying out investigations	Patterns
ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other 3-PS2-3. NGSS Identifier	PS2.B	Asking questions and defining problems	Cause and effect
define a simple design problem that can be solved by applying scientific ideas about magnets 3-PS2-4. NGSS Identifier	PS2.B	Asking questions and defining problems	

Grade 3 Life Science

Montana Standard *Students must know and be able to:*	Disciplinary Core Ideas (DCI's)	Science and Engineering Practices (SEP's)	Crosscutting Concepts (CCC's)
construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all 3-LS4-3. NGSS Identifier	LS4.C	Engaging in argument from evidence	Cause and effect

make a claim about the effectiveness of a solution to a problem caused when the environment changes and that the types of plants and animals that live there may change 3-LS4-4. NGSS Identifier	LS2.C	Engaging in argument from evidence	System and System Models
construct a cause and effect argument communicating some animals, including humans, form groups and communities that help members survive 3-LS2-1. NGSS Identifier	LS2.D	Engaging in argument from evidence	Cause and effect
analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago 3-LS4-1. NGSS Identifier	LS4.A	Analyze and Interpret data	Scale proportion and quantity
develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death 3-LS1-1. NGSS Identifier	LS1.B	Developing and Using Models	Patterns
analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms 3-LS3-1. NGSS Identifier	LS3.A	Analyze and Interpret data	Patterns
use evidence to support the explanation that traits can be influenced by the environment 3-LS3-2. NGSS Identifier	LS3.A & LS3.B	Construct explanations and Design Solutions	Cause and effect

use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing 3-LS4-2. NGSS Identifier	LS4.B	Construct explanations and Design Solutions	Cause and effect
Grade 3 Earth and Space Science			
Montana Standard *Students must know and be able to:*	Disciplinary Core Ideas (DCI's)	Science and Engineering Practices (SEP's)	Crosscutting Concepts (CCC's)
obtain and represent data using tables and graphical displays to describe observed and predicted weather conditions during a particular season 3-ESS2-1. NGSS Identifier	ESS2.D	Obtaining, Evaluating, and Communicating Information	Patterns
obtain and combine information to describe climate patterns in different regions of the world 3-ESS2-2. NGSS Identifier	ESS2.D	Constructing explanations and designing solutions	Stability and Change
make a claim based on information about the merit of a design solution that reduces the impacts of a weather-related hazard 3-ESS3-1. NGSS Identifier	ESS3.B	Engaging in argument from evidence	Cause and effect