Iowa Next Generation Science Standards

Grade 8

Adopted 2015

Matter and Its Interactions MS-PS1	**MS-PS1-3.**	**Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.** MS-PS1-3
Motion and Stability: Forces and Interactions MS-PS2	**MS-PS2-1.**	**Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.** MS-PS2-1
	MS-PS2-2.	**Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.** MS-PS2-2
Energy MS-PS3	**MS-PS3-1.**	**Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.** MS-PS3-1
	MS-PS3-3.	**Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.** MS-PS3-3
Waves and Their Applications in Technologies for Information Transfer MS-PS4	**MS-PS4-1.**	**Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.** MS-PS4-1
	MS-PS4-2.	**Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.** MS-PS4-2
	MS-PS4-3.	**Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.** MS-PS4-3
Ecosystems: Interactions, Energy, and Dynamics MS-LS2	**MS-LS2-5.**	**Evaluate competing design solutions for maintaining biodiversity and ecosystem services.** MS-LS2-5
Biological Evolution: Unity and Diversity MS-LS4	**MS-LS4-1.**	**Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.** MS-LS4-1

	MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. MS-LS4-2
	MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. MS-LS4-3
	MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. MS-LS4-4
	MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. MS-LS4-5
	MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. MS-LS4-6
Earth's Systems MS-ESS2	**MS-ESS2-4.** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. MS-ESS2-4
	MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. MS-ESS2-5
	MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. MS-ESS2-6
Earth and Human Activity MS-ESS3	**MS-ESS3-3.** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. MS-ESS3-3
	MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. MS-ESS3-4
	MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. MS-ESS3-5
Engineering Design MS-ETS1	**MS-ETS1-1.** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-1

MS-ETS1-2. **Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.** MS-ETS1-2

MS-ETS1-3. **Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.** MS-ETS1-3

MS-ETS1-4. **Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.** MS-ETS1-4