



I Can...

MS. Motion and Stability: Forces and Interactions

- Ask questions about data to determine the factors that affect the strength of electric and magnetic force.
- Support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
- Design an experiment that provides evidence that fields exist between objects and exerting forces.
- Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- 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. Energy

- Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- Plan an investigation to determine the relationship among the energy transferred, the type of matter, the mass and the change in kinetic energy of the particles as measured by the temperature of the sample.
- Support the claim that when the kinetic energy of an object changes, energy is transferred.
- Construct and interpret graphs of data to describe the relationships of kinetic energy to the mass and speed of an object.
- Design, construct and test a device that either minimizes or maximizes thermal energy transfer.

MS. Earth's Place in the Universe

- Develop and use a model of the Earth-sun-moon system to describe lunar phases, eclipses and seasons.
- Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6 billion year old history.



MS. From Molecules to Organisms: Structures and Processes

- Provide reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants.
- Construct a scientific explanation for how environmental and genetic factors influence the growth of organisms.
- Explain the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- Develop a model to describe how food is rearranged through chemical reactions.

MS. Ecosystems: Interactions, Energy, and Dynamics

- Provide evidence for the effects of resource availability on organisms and populations in an ecosystem.
- Explain how patterns form among organisms across multiple ecosystems.
- Develop a model to describe the cycling and flow of energy among living and nonliving parts of an ecosystem.
- Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

MS. Heredity: Inheritance and Variation of Traits

- Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

MS. Engineering Design

- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account how people and the environment may limit solutions.
- Evaluate competing design solutions to see how well they meet the criteria and constraint of the problem.
- Identify the characteristics of several design solutions.
- Develop a model to generate data for testing and modification of a proposed object, tool or process.

MS. Matter and Its Interactions

- Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.



MS. Waves and Their Applications in Technologies for Information Transfer

- 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.
- Develop and use a model to describe that waves are reflected, absorbed or transmitted through various materials.
- Integrate 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. Biological Evolution: Unity and Diversity

- Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout history of life on Earth.
- Apply scientific ideas to construct an explanation to infer evolutionary relationships.
- Analyze displays of pictorial data to identify relationships not evident in the fully formed anatomy.
- Construct an explanation based on evidence that explains the probability of some individual's surviving and reproducing in a specific environment.
- Gather and synthesize information about the technologies that have changed the way humans influence inherited traits.
- Use mathematical representation to support how natural selection leads to an increase or decrease of a species over time.

MS. Earth's Systems

- Develop a model to describe the cycling of water through Earth's systems.
- Provide evidence for how complex interactions of air masses results in change of weather.
- Develop a model to describe how unequal heating of the Earth causes patterns of atmospheric and oceanic circulation.

MS. Earth and Human Activity

- Design a method for monitoring and minimizing human impact on the environment.
- Construct an argument supported how increases in human population and consumption of natural resources impact Earth's systems.
- Ask questions to clarify evidence of global warming.