

8th Grade Science Essential Curriculum

Motion

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](#))

Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects, such as the impact of collisions between two cars. ([MS-PS2-1](#))

Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. Examples of evidence include temperature changes and motion of the object. ([MS-PS3-5](#))

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](#))

Develop and use a model to describe that sound and light waves are reflected, absorbed, or transmitted through various materials. ([MS-PS4-2](#))

Integrate qualitative scientific and technical information to develop an understanding that waves are used for communication purposes and to support the claim that digitized signals are a more reliable way to transmit information than analog signals. ([MS-PS4-3](#))

Interactions of the Solar System

Analyze and interpret data gathered by telescopes and spacecraft to determine scale properties of objects in the solar system. ([MS-ESS1-3](#))

Construct and present arguments using evidence from simulations and data charts to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. ([MS-PS2-4](#))

Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. ([MS-ESS1-1](#))

Develop and use a model to describe how gravity holds together both galaxies and the solar system and controls orbital motions within them. ([MS-ESS1-2](#))

Biotic Diversity

Construct an explanation for the anatomical similarities and differences among and between both modern and fossil organisms to infer evolutionary relationships. ([MS-LS4-2](#))

Analyze pictures of embryos of multiple species to compare of similarity in order to identify relationships not evident in the fully formed anatomy. ([MS-LS4-3](#))

Construct an explanation 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](#))

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](#))

Use evidence-based argument to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction. ([MS-LS1-4](#))

Inheritance

Develop and use a model to describe why asexual reproduction results in genetically identical offspring and sexual reproduction results in offspring with genetic variation. ([MS-LS3-2](#))

Develop and use a model to gain a conceptual understanding of why genetic mutations may affect protein production and may result in harmful, beneficial, or neutral effects on the organism. ([MS-LS3-1](#))

Gather and synthesize information about technologies such as genetic modification and gene therapy that have impacted science and society. ([MS-LS4-5](#))