Mapleton Public Schools

Colorado Academic Standards for Science

Priority Standards: 8th Grade

Grade. Standard. Grade Level Expectation. Evidence Outcome (NGSS Standard Code)

Standard 1: Physical Science

MS.1.3: Motion is described relative to a reference frame that must be shared with others and is determined by the sum of the forces acting on it. The greater the mass of the object, the greater the force needed to achieve the same change in motion.

MS.1.3.a: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. (MS-PS2-1)

MS.1.3.b: 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)

MS.1.4: Forces that act a distance (gravitational, electric, and magnetic) can be explained by force fields that extend through space and can be mapped by their effect on a test object.

MS.1.4.b: Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. (MS-PS2-4)

MS.1.4.c: Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. (MS-PS2-5)

MS.1.5: Kinetic energy can be distinguished from the various forms of potential energy.

MS.1.5.a: 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.1.5.b: 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. (MS-PS3-2)

MS.1.5.e: 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. (MS-PS3-5)

MS.1.8: A simple wave model has a repeating pattern with specific wavelength, frequency, and amplitude and mechanical waves need a medium through which they are transmitted. This model can explain many phenomena which include light and sound.

MS.1.8.a: 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. [Clarification Statement: Emphasis is on describing waves with both qualitative and quantitative thinking.] [Assessment Boundary: Assessment does not include electromagnetic waves and is limited to standard repeating waves.] (MS-PS4-1)

MS.1.8.b: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (MS-PS4-2)

MS.1.9: A wave model of light is useful to explain how light interacts with objects through a variety of properties.

MS.1.9.a Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (MS-PS4-2)

Standard 2: Life Science

MS.2.9: Fossils are mineral replacements, preserved remains, or traces of organisms that lived in the past.

MS.2.9.a: 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.2.9.b: 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.2.10: Genetic variations among individuals in a population give some individuals an advantage in surviving and reproducing in their environment.

MS.2.10.a: 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.2.10.c: 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)

Standard 3: Earth and Space Science

MS.3.1: Motion is predictable in both solar systems and galaxies.

MS.3.1.a: 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)

MS.3.1.b: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. (MS-ESS1-2)

MS.3.2: The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.

MS.3.2.b: Analyze and interpret data to determine scale properties of objects in the solar system. (MS-ESS1-3)

MS.3.3: Rock strata and the fossil record can be used as evidence to organize the relative occurrence of major historical events in Earth's history.

MS.3.3.a: 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-ESS1-4)