Oklahoma Science

Grade 8

Adopted 2020

Motion and Stability: Forces and Interactions	1. **Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects in a system.** 8.PS2.1
	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.** 8.PS2.2
	3. **Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.** 8.PS2.3
	4. **Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.** 8.PS2.4
	5. **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.** 8.PS2.5
Waves and Their Applications in Technologies for Information Transfer	1. **Use mathematical representations to describe patterns in a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.** 8.PS4.1
	3. **Integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.** 8.PS4.3
From Molecules to Organisms: Structure and Processes	4. **Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.** 8.LS1.4
	5. **Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.** 8.LS1.5
Heredity: Inheritance and Variation of Traits	1. **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.** 8.LS3.1

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	2. **Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.** 8.LS3.2
Biological Unity and Diversity	1. **Analyze and interpret data to identify patterns within the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth.** 8.LS4.1
	2. **Apply scientific ideas to construct an explanation for the patterns of anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer ancestral relationships.** 8.LS4.2
	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.** 8.LS4.3
	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.** 8.LS4.4
	5. **Gather and synthesize information about the practices that have changed the way humans influence the inheritance of desired traits in organisms.** 8.LS4.5
	6. **Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.** 8.LS4.6
Earth's Place in the Universe	1. **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.** 8.ESS1.1
	2. **Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.** 8.ESS1.2
	3. **Analyze and interpret data to determine scale properties of objects in the solar system.** 8.ESS1.3