2025-2026 SCIENCE PACING 8th Grade

TERM 1

Matter and Its Interactions/ Motion and Stability: Forces and Interactions

8.PS1: Matter and Its Interactions

1) Use a model to understand that atoms are a system composed of a positively charged nucleus surrounded by one or more negatively charged particles called electrons.

8.PS2: Motion and Stability: Forces and Interactions

2) Ask scientific questions about data to determine how manipulating variables can increase or diminish the electric current and magnetic field strength in electromagnets, generators, and electric motors.

1) Conduct an investigation to provide evidence that the size of force fields (electric and magnetic) depends on the magnitudes of the charges, current, or magnetic strengths involved and the distances between interacting objects.

4) Construct an explanation to describe why the position and motion of object(s) in a system, and the effects of forces on those objects, vary with respect to the observer.

5) Plan and conduct 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.

6) Evaluate and interpret that for every force exerted on an object there is an equal force exerted in the opposite direction.

8.ETS1: Engineering Design

1) Use a model of a device that incorporates an electromagnet to test solutions to a design problem with specific criteria and constraints.

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TERM 2

Matter and Its Interactions/ Motion and Stability: Forces and Interactions/ Waves and Their Applications in Technologies for Information Transfer/ Engineering Design/ Links Among Engineering, Technology, and Applications of Science

8.PS4: Waves and Their Applications in Technologies for Information Transfer

1) Develop and use models to represent the basic properties of waves in a system including frequency, amplitude, wavelength, and speed.

2) Construct explanations from observed patterns of wave behaviors to compare and contrast mechanical waves and electromagnetic waves based on refraction, reflection, transmission, absorption, and their behavior through a vacuum and/or various media.

3) Engage in argument from evidence to support the claim that digitized signals, sent as wave pulses, are more reliable than analog signals to transmit information in a system.

8.PS1: Matter and Its Interactions

2) Develop a model to explain how the light coming from distant stars and the formation of heavier atoms is the result of changes in the composition of the nucleus of the atom and the energy released during the process of nuclear fusion.

8.PS2: Motion and Stability: Forces and Interactions

3) Construct an argument using evidence to support the claim that gravitational interactions in a large-scale system (e.g., galaxies and solar system) are attractive and depend on the masses of and distance between interacting objects.

8.ESS1: Earth's Place in the Universe

1) Research, analyze, and communicate that the universe began with a period of rapid expansion using evidence from the motion of galaxies (i.e., redshift and blueshift), elemental concentrations of hydrogen and helium, and cosmic background radiation.

8.ETS2: Links Among Engineering, Technology, and Applications of Science

1) Research and communicate information to describe how data from technologies (e.g., telescopes, satellites, space probes, seismographs) provide information about Earth and objects in space and how those scientific discoveries have in turn led to improved technologies.

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TERM 3

Earth's Place in the Universe/ Earth's Systems/ Biological Change: Unity and Diversity

8.ESS3: Earth and Human Activity

1) Collect data, map, and describe patterns in the locations of volcanoes and earthquakes related to tectonic plate boundaries, interactions, and hotspots in order to forecast the locations and likelihoods of future events.

8.ESS2: Earth's Systems

1) Analyze and interpret data to support the assertion that rapid or gradual geographic changes lead to drastic population changes and extinction events.

2) Evaluate data collected from seismographs to create a model of Earth's structure and to understand how energy is derived from Earth's hot interior.

3) Gather and evaluate evidence that energy from the earth's interior drives convection cycles within the asthenosphere which creates changes within the lithosphere including plate movements, plate boundaries, and sea-floor spreading.

4) Construct a scientific explanation using data that explains the gradual process of plate tectonics accounting for (a) the distribution of fossils on different continents, and (b) continental and ocean floor features (i.e., mountains, volcanoes, faults, and trenches).

8.LS4: Biological Change: Unity and Diversity

1) Using evidence from the geologic timescale, analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change in life forms throughout Earth's history.

2) Construct an explanation addressing similarities and differences of the anatomical structures and genetic information between extinct and extant organisms using evidence of common ancestry and patterns between taxa.

TERM 4

Biological Change: Unity and Diversity

8.LS4: Biological Change: Unity and Diversity

3) Construct an explanation based on evidence that explains how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing.

4) Develop a scientific explanation of how natural selection plays a role in determining the survival and reproduction of a species in a changing environment.

5) Obtain, evaluate, and communicate information about the technologies that have changed the way humans use artificial selection to influence the inheritance of desired traits in other organisms.

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