2023-2024
Jackson County Schools
8th Grade Science Pacing Guide

1st Quarter

Properties of Matter

***Focus Standard 8.2 - Pure Substances** Proficiency Scale
Plan and carry out investigations to generate evidence supporting the claim that one pure substance can be distinguished from another based on characteristic properties.

***Focus Standard 8.4 - Thermal Energy** Proficiency Scale
Design and conduct an experiment to determine changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed from a system.

***Focus Standard 8.5 - Chemical Reactions** Proficiency Scale
Observe and analyze characteristic properties of substances (e.g., odor, density, solubility, flammability, melting point, boiling point) before and after the substances combine to determine if a chemical reaction has occurred.

Standard 8.7 - Thermal Energy and Chemical Reactions
Design, construct, and test a device (e.g., glow stick, hand warmer, hot or cold pack, thermal wrap) that either releases or absorbs thermal energy by chemical reactions (e.g., dissolving ammonium chloride or calcium chloride in water) and modify the device as needed based on criteria (e.g., amount/concentration, time, temperature).

AMSTI Modules:
- ➔ Exploring the Properties of Matter
- ➔ Experimenting with Mixtures, Compounds, and Elements

Additional Resources:
AMSTI Learning Resources
AMSTI Formative Assessment Set

2nd Quarter

Mixtures, Compounds, and Elements

Standard 8.1 - Periodic Table Properties
Analyze patterns within the periodic table to construct models (e.g., molecular-level models, including drawing; computer representations) that illustrate the structure, composition, and characteristics of atoms and simple and complex molecules.

***Focus Standard 8.3 - Compounds, Mixtures, and Solutions** Proficiency Scale
Construct explanations based on evidence from investigations to differentiate among compounds, mixtures, and solutions.

***Focus Standard 8.6 - Conservation of Matter** Proficiency Scale
Create a model, diagram, or digital simulation to describe conservation of matter and mass in a chemical reaction and explain the resulting differences between products and reactants.

AMSTI Modules:
- ➔ Experimenting with Mixtures, Compounds, and Elements
- ➔ Exploring the Properties of Matter

Additional Resources:
AMSTI Learning Resources
AMSTI Formative Assessment Set

3rd Quarter

Newton's Laws of Motion

***Focus Standard 8.8 - Newton's First Law** Proficiency Scale
Use Newton's first law to determine and explain that an object is either at rest or moves at a constant velocity unless acted upon by an external force (e.g., model car on a table remaining motionless until pushed).

***Focus Standard 8.9 - Newton's Second Law** Proficiency Scale
Use Newton's second law to demonstrate and explain how changes in an object's motion depend on the sum of the forces on the object and the mass of the object (e.g., billiard balls moving when hit with a cue stick).

***Focus Standard 8.10 - Newton's Third Law** Proficiency Scale
Use Newton's third law to design a model to demonstrate and explain the resulting motion of two colliding objects (e.g., two cars bumping into each other, a hammer hitting a nail).

Energy and Force

Standard 8.13 - Graphing Kinetic Energy
Create and analyze graphical displays of data to illustrate the relationships of kinetic energy to the mass and speed of an object (e.g., riding a bicycle at different speeds, hitting a table tennis ball, rolling similar toy cars with different masses down an incline).

Standard 8.14 - Types of Potential Energy
Use models to construct an explanation of how a system of objects may contain varying types and amounts of potential energy (e.g., observing the movement of a roller coaster cart at various inclines, changing the tension in a rubber band, varying the number of batteries in a series, observing a balloon with static electrical charge being brought closer to a classmate's hair).

Standard 8.15 - Thermal Energy Transfer
Analyze and interpret data from experiments to determine how various factors affect energy transfer as measured by temperature (e.g., comparing final water temperatures after different masses of ice melt in the same volume of water with the same initial temperature, observing the temperature change of samples of different materials with the same mass and the same material with different masses when adding a specific amount of energy).

***Focus Standard 8.16 - Conservation of Energy** Proficiency Scale
Apply the law of conservation of energy to develop arguments supporting the claim that when the kinetic energy of an object changes, energy is transferred to or from the object (e.g., bowling ball hitting pins, brakes being applied to a car).

AMSTI Modules:
- ➔ Experimenting with Forces and Motion
- ➔ Electricity, Waves, and Information Transfer

Additional Resources:
AMSTI Learning Resources
AMSTI Formative Assessment Set

4th Quarter

Indirect Forces

Standard 8.11 - Factors Affecting Indirect Forces
Plan and carry out investigations to evaluate how various factors (e.g., electric force produced between two charged objects at different distances; magnetic force produced by an electromagnet with varying number of wire turns, varying number or size of dry cells, and varying size of iron core) affect the strength of electric and magnetic forces.

Standard 8.12 - Indirect Forces
Construct an argument from evidence explaining that fields exist between objects exerting forces on each other (e.g., interactions of magnets, electrically charged strips of tape, electrically charged pith balls, gravitational pull of the moon creating tides) even when the objects are not in contact.

Waves

***Focus Standard 8.17 - Properties of Waves** Proficiency Scale
Create and manipulate a model of a simple wave to predict and describe the relationships between wave properties (e.g., frequency, amplitude, wavelength) and energy.

***Focus Standard 8.17a - Electromagnetic Spectrum** Proficiency Scale
Analyze and interpret data to illustrate an electromagnetic spectrum.

***Focus Standard 8.18 - Wave Interactions** Proficiency Scale
Use models to demonstrate how light and sound waves differ in how they are absorbed, reflected, and transmitted through different types of media.

Standard 8.19 - Wireless Communication
Integrate qualitative information to explain that common communication devices (e.g., cellular telephones, radios, remote controls, Wi-Fi components, global positioning systems GPS, wireless technology components) use electromagnetic waves to encode and transmit information.

AMSTI Modules:
- ➔ Electricity, Waves, and Information Transfer
- ➔ Experimenting with Forces and Motion

Additional Resources:
AMSTI Learning Resources
AMSTI Formative Assessment Set