



Content Area: Science

Grade Level: 6

Course Name: Middle School Physical Science

Course Description: Students explore middle school physical science standards. The skills and concepts embedded into these units are tied to the New York State 8th Grade Science Assessment, however there is no state assessment at the end of grade 6. The descriptions of the units listed below are not exhaustive for each unit, but are meant to provide limited examples of student learning outcomes for each.

Units Length of Time	Description
Structure of Matter (5 weeks)	Students explore what matter is, how it is constructed, and how it is modeled by scientists. Throughout portions of this unit, students will: <ul style="list-style-type: none">- explain the difference between an atom and molecule.- Use chemical formulas to tell what elements and the number of each element that make up different molecules.- Discover patterns in molecules by studying crystals- Model different substances by rearranging atoms,
Properties and Mixtures (5 weeks)	Students will explore how we use properties to identify substances and mixtures. Throughout portions of this unit, students will: <ul style="list-style-type: none">- Compare and contrast chemical vs. physical properties- Explore volume, mass, and density as well as the tools scientists use to measure each property.- Discover pure substances vs mixtures and learn how to separate mixtures physically.

Units Length of Time	Description
	<ul style="list-style-type: none"> - Identify an unknown substance -
Chemical Reaction and the Conservation of Mass (5 weeks)	<p>Students will look for signs that a substance has changed chemically. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Study the phenomenon of rotting fruit as it relates to a chemical reaction. - Identify various signs of a chemical reaction. - Use a PhET simulation to identify chemical reactants and products - Study a reaction to demonstrate Conservation of Mass - Determine if a reaction is endo or exothermic
Heat and Matter (3 weeks)	<p>Students will study when and how thermal energy is transferred. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Model the relationship between thermal energy and atoms/molecules - Study the effects of adding and subtracting thermal energy on various matter and temperature.
Changes in Energy and Thermal Transfer (4 weeks)	<p>Students will study the effects of thermal energy transfer on various substances. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Relate thermal energy to phase changes in matter. - Study the differences between a conductor and an insulator. - Model how energy can transfer via conduction, convection, and radiation. - Design and engineer a medicine cabinet which minimizes thermal energy transfer
Newton's Third Law (3 weeks)	<p>Students will begin to examine the properties of forces through the study of Newton's 3rd Law. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Model simple force diagrams to predict the direction of an object's motion. - Compare and contrast mass, weight, and force required to move an object.
Gravitational Forces (3 weeks)	<p>Students will examine how objects can attract/interact with each other by the force of gravity. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Model the relationship between mass and gravitational force. - Model the relationship between distance and gravitational force. - Learn how each variable affects the force of gravity on different celestial objects.
Electric and Magnetic Forces	<p>Students will examine the various properties and relationship of electric and magnetic forces and discover what substances can and cannot conduct electricity and are and are not magnetic. Throughout portions of this unit, students will:</p>

Units Length of Time	Description
(4 weeks)	<ul style="list-style-type: none"> - Learn about electromagnetism and model and electromagnetic field. - Study the relationship between strength of an electromagnet and the number of wire loops on a solenoid. - Discover common uses for electromagnets by humans.

Kinetic and Potential Energy (4 weeks)	<p>Students will examine the relationship between kinetic and potential energy and apply that relationship to common phenomena. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Define, compare and contrast kinetic and potential energy. - Relate kinetic and potential energy to the Law of Conservation of Energy. - Apply both concepts to common phenomena such as roller coasters, archery, and bowling.
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Waves (2 weeks)	<p>Students will examine basic principles that define different wave types. Throughout portions of this unit, students will:</p> <ul style="list-style-type: none"> - Define and relate amplitude, wavelength and frequency of common waveforms - Explain how waves travel through different mediums - Study the concepts of basic refraction and reflection of light waves
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NYS Standard	Links
	Click here to learn more about the New York State Science Learning Standards!