



Eighth Grade Science
Science Course Outline - 1st Quarter

<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
Nature of Science <ul style="list-style-type: none"> • Students will modify the scientific method as necessary and apply it to various problems. • Students will demonstrate science safety rules during lab group experiences. • Students will demonstrate science process skills. • Students will design experiments using three types of variables appropriately. • Students will record and classify observations. • Students will design data tables and collect data. • Students will construct bar, line, and circle graphs and analyze data. • Students will draw conclusions and communicate results orally and in written reports. 	2 Weeks 5 days/wk 45 min/day	<ul style="list-style-type: none"> • Various Lab Materials 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project • Lab Reports

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<p>Atomic History & Structure</p> <ul style="list-style-type: none"> • Students will compare and contrast modern atomic models to the atom as understood by ancient Greek philosophers. • Students will summarize the current understanding of the atom. • Students will describe the major discoveries leading to the modern atomic model. • Students associate the key scientist with each advance in the atomic model. • Students will describe the three major subatomic particles and their locations in an atom. • Students will define atomic number and explain its significance. • Students will discuss the significance of isotopes and how a mass number identifies them. • Students will state and use the general rules that establish the electron configuration of an atom. 	<p>2 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Project - Atomic Model Timeline • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project • Lab Reports

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<p>History of the Periodic Table & Arrangement</p> <ul style="list-style-type: none"> • Students will describe the organization and features of Mendeleev’s periodic table. • Students will describe properties of metals and nonmetals. • Students will explain how electron configuration affects the properties of metals and nonmetals. • Students will compare metalloids with metals and nonmetals. • Students will define a family or group of elements. • Students will name the major element families and state how many valence electrons a neutral atom of each element has. • Students will define a chemical period and state the significance of the period number. 	<p>2 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Project - Element Cubes • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project • Lab Reports

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<p>Chemical Bonding & Types of Compounds</p> <ul style="list-style-type: none"> • -Students will explain why atoms bond together. • -Students will describe covalent, ionic, and metallic bonds. • -Students will illustrate covalent, ionic, and metallic bonds using Lewis Dot structures. • -Students will explain what makes a bond polar and how it affects the properties of covalent compound. • Students will identify which elements become anions and cations. 	<p>3 Weeks 5 days/wk min/day</p>	<ul style="list-style-type: none"> • Various Models & Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
<p>Chemical Reactions</p> <ul style="list-style-type: none"> • Students will use the periodic table to state the usual oxidation numbers to write compound formulas. • Students will use oxidation numbers to write compound formulas. • Students will name ionic compounds. • Students recognize evidence for a chemical reaction. • Students will state the information provided by chemical equations. • Students will describe the structure of chemical equations. • Students will translate word equations into formula equations. • Students will balance a chemical formula equation. • Students will recognize the four general kinds of chemical reactions. • Students will describe the difference between endothermic and exothermic reactions. 	<p>3 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities and Models 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<p>Phases of Matter</p> <ul style="list-style-type: none"> • Students will identify physical and chemical properties for a specific type of matter. • Students will classify changes in matter as physical or chemical changes. • Students will understand the Law of Conservation of Matter. • Students will list the types of changes matter can undergo. • Students will relate temperature with change of state. • Students will explain each change of state using the kinetic-molecular model of matter. 	<p>2 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<p>Mixtures & Solutions</p> <ul style="list-style-type: none"> • -Students will differentiate between homogeneous and heterogeneous mixtures. • -Students will describe and give examples of the different kinds of heterogeneous mixtures. • -Students will explain the differences between colloids and suspensions. • -Students will describe the properties of water that make it a good solvent. • -Students will explain how solute particles dissolve. • Students will define solubility and explain what factors affect it. • Students will compare unsaturated, saturated, and supersaturated solutions. • Students will explain conditions that can affect the rate of solution. 	<p>1.5 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<p>Acids, Bases, & the pH Scale</p> <ul style="list-style-type: none"> • Students will define acids and bases using both the pH scale. • Students will describe the process of water ionization that occurs in pure water and all water solutions. • Students will list common properties of acids and bases. • Students will explain the fundamental chemical reactions in a neutralization reaction. • Students will predict the salt compound formed by the neutralization of an acids and bases • Students will describe the pH scale and its basis. 	<p>1.5 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<p>Thermodynamics</p> <ul style="list-style-type: none"> • Students will explain temperature change in terms of thermal energy. • Students will compare and contrast the Fahrenheit, Celsius, and absolute temperature scales. • Students will convert temperatures between all three temperature scales. • Students will describe how a thermometer works. • Students will describe the flow of thermal energy. • Students will describe and calculate specific heat capacity. • Students will describe three methods of heat transfer and give an example of each. 	<p>1 Week 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
<p>Motion & Forces</p> <ul style="list-style-type: none"> • Students will determine when an object is in motion and calculate its speed and velocity. • Students will define force. • Students will explain how balanced and unbalanced forces are related to an object's motion. • Students will describe friction, and identify factors that determine the friction force between two objects. • Students will identify the factors that affect the gravitational force between two objects. • Students will model Newton's first, second, and third laws of motion • Students will state the law of conservation of momentum. 	<p>3 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Project - Newton's Laws of Motion • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project • Lab Reports

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Science Course Outline - 3rd Quarter

<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
Work and Machines <ul style="list-style-type: none">• Students will identify when work is done on an object.• Students will explain how machines make work easier.• Students will describe the six kinds of simple machines.• Students will create a Rube Goldberg-type drawing of a compound machine.	2 Weeks 5 days/wk 45 min/day	<ul style="list-style-type: none">• Various Lab Activities	<ul style="list-style-type: none">• Physical Science Textbook	<ul style="list-style-type: none">• Homework• Unit project• Interactive web-based models

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Energy & Power <ul style="list-style-type: none">• Students will describe how energy, work and power are related.• Students will name and describe the two basic kinds of energy.• Students will identify common energy transformations.• Students will state the law of conservation of energy.	2 Weeks 5 days/wk 45 min/day	<ul style="list-style-type: none">• Lab - Energy Conversions• Project - Simple Machines	<ul style="list-style-type: none">• Physical Science Textbook	<ul style="list-style-type: none">• Homework• Unit project

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Fluid Mechanics & Gas Laws <ul style="list-style-type: none">• Students will describe how fluid pressure changes with depth.• Students will explain the effect of the buoyant force.• Students will summarize Archimedes' contributions related to buoyancy.• Students will predict whether an object will float or sink based on its density.	2 Weeks 5 days/wk 45 min/day	Various Lab Activities	Physical Science Textbook	Homework Unit project Lab Reports

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Science Course Outline - 4th Quarter

<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
<p>Waves</p> <ul style="list-style-type: none"> • Students will compare and contrast the properties of longitudinal and transverse waves. • Students will define what a wave is. • Students will label the parts of a wave on a diagram. • Students will calculate the wavelength or frequency using the wave speed equation. • Students will describe how waves, reflect, refract, and diffract. • Students will explain constructive and destructive interference. • Students will describe the Doppler Effect. 	<p>3 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project

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<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
<p>Electromagnetic Radiation and Light</p> <ul style="list-style-type: none"> • Students will compare and contrast sound waves and electromagnetic waves. • Students will depict and describe the waves that make up the electromagnetic spectrum. • Students will describe different types of light bulbs. • Students will explain how wireless communication is possible because of electromagnetic waves. • Students will identify wave interactions including, reflection, refraction, and diffraction. 	<p>3 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Various Lab Activities 	<ul style="list-style-type: none"> • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Unit project • Group Projects

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<i>Unit & Content Objectives</i>	<i>Time</i>	<i>Activities & Methods</i>	<i>Books & Materials</i>	<i>Evaluation Techniques</i>
<p>Electricity and Magnetism</p> <ul style="list-style-type: none"> • Students will explain how an electric current is produced. • Students will predict and test whether objects are insulators or conductors. • Students will draw, interpret, and construct series and parallel circuits. • Students will summarize the connection between electricity and magnetism. • Students will develop an awareness of the interactions and processes of Earth's magnetism. • Students will explain how electrical energy can be transformed into mechanical energy and mechanical energy transformed into electricity. 	<p>3 Weeks 5 days/wk 45 min/day</p>	<ul style="list-style-type: none"> • Lab - Static Electricity • Lab - Circuits & Currents • Project - Pathway of Power 	<ul style="list-style-type: none"> • Delta Science Module: Electrical Connections • Physical Science Textbook 	<ul style="list-style-type: none"> • Homework • Classwork • Lab Reports