

Grade 7 Science

Unit 1 The Classification of Matter

Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
4 weeks	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	Elements are the basic building blocks of matter that cannot be broken down chemically and are made up all of the same type of atoms.	Student should be able to recognize that the atom is the basic building block for all matter.	Glencoe – Physical Science Chapter 15 Sec 1 Pgs 450-451 Associated PowerPoint and Worksheets Lab kit Element samples	Substance Element	S7.C.1.1.2 S7.C.1.1.3 S8.C.1.1.1 S8.A.3.3.1 S8.A.3.3.2	Demo – Sodium and water
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	When two or more substances are combined, they may react chemically to form a new substance with new properties.	Student should be able to identify the differences between elements and compounds.	Glencoe – Physical Science Chapter 15 Sec 1 Pgs 452 Associated PowerPoint and Worksheets	Compound	S7.C.1.1.2 S7.C.1.1.3 S8.C.1.1.1 S8.A.3.3.1 S8.A.3.3.2	
	Matter has observable physical properties and the potential to mix and form new	How do scientists identify and sort materials?	When two or more substances are combined, they may form a mixture and maintain their original properties.	Student should be able to identify the differences between substances and mixtures.	Glencoe – Physical Science Chapter 15 Sec 1 Pgs 453-456 Associated PowerPoint and Worksheets	Heterogeneous Homogeneous Mixtures Solution Colloid	S7.C.1.1.2 S7.C.1.1.3 S8.C.1.1.1 S8.A.3.3.1 S8.A.3.3.2	Video - Element, Compound and mixture Lab - Element, Compound and Mixture

	materials					Tyndall effect Suspension		Lab – Separating mixtures
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	When two or more substances are combined, they may form a mixture and maintain their original properties.	Student should be able to compare and contrast solutions, colloids and suspensions	Glencoe – Physical Science Chapter 15 Sec 1 Pgs 453-456 Associated PowerPoint and Worksheets	Heterogeneous Homogeneous Mixtures Solution Colloid Tyndall effect Suspension	S7.C.1.1.2 S7.C.1.1.3 S8.C.1.1.1 S8.A.3.3.1 S8.A.3.3.2	
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	A substance has characteristic properties.	Student should be able to compare and contrast physical and chemical properties.	Glencoe – Physical Science Chapter 15 Sec 2 Pgs 458-464 Associated PowerPoint and Worksheets	Physical property Chemical property Distillation	S6.C.1.1.1 S6.C.1.2.2 S7.C.1.1.1 S7.C.1.1.4 S8.C.1.1.2	Video – Chemical changes Lab – Physical and Chemical change
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	A substance has characteristic properties.	Student should be able to identify substances using physical and chemical properties.	Glencoe – Physical Science Chapter 15 Sec 2 Pgs 458-464 Associated PowerPoint and Worksheets		S6.C.1.1.1 S6.C.1.2.2 S7.C.1.1.1 S7.C.1.1.4 S8.C.1.1.2	
	Matter has observable physical	How do scientists identify and sort materials?	A substance has characteristic properties.	Student should be able to compare and contrast	Glencoe – Physical Science Chapter 15 Sec 2 Pgs 458-464	Physical Change Chemical	S6.C.1.1.1 S6.C.1.2.2 S7.C.1.1.1	

	properties and the potential to mix and form new materials			physical and chemical changes	Associated PowerPoint and Worksheets	change	S7.C.1.1.4 S8.C.1.1.2	
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	A substance has characteristic properties.	Student should be able to calculate the density of any substance given its mass and volume.	Glencoe – Physical Science Chapter 15 Sec 2 Pgs 458-464 Associated PowerPoint and Worksheets	Density Mass Volume	S6.C.1.1.2	
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	A substance has characteristic properties.	Student should be able to distinguish between physical and chemical changes.	Glencoe – Physical Science Chapter 15 Sec 2 Pgs 458-464 Associated PowerPoint and Worksheets		S6.C.1.1.1 S6.C.1.2.2 S7.C.1.1.1 S7.C.1.1.4 S8.C.1.1.2	
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists identify and sort materials?	A substance has characteristic properties.	Student should be able to explain how the law of conservation of mass applies to chemical changes	Glencoe – Physical Science Chapter 15 Sec 2 Pg 465 Associated PowerPoint and Worksheets	Law of Conservation of mass	S8.A.3.1.4	Review Unit 1 Assessment Unit 1

Review Unit 1 The Classification of Matter

Assessment Unit 1 The Classification of Matter

Unit 2 The States of Matter

Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
4 weeks	Matter has observable physical properties and the potential to mix and form new materials	What determines whether a substance is a solid, liquid or gas?	Particles are always in motion with the smallest motion in solids progressing to the largest motion in gases.	Student should be able to explain using a model the kinetic theory of matter	Glencoe – Physical Science Chapter 16 Sec 2 Pgs 476-477 Associated PowerPoint and Worksheets	Kinetic theory Diffusion Plasma Thermal Expansion	S7.C.1.2.2 S8.A.3.3.2	Demo – Ball and ring/ Bi-metallic strip
	Matter has observable physical properties and the potential to mix and form new materials	What determines whether a substance is a solid, liquid or gas?	Particles are always in motion with the smallest motion in solids progressing to the largest motion in gases.	Student should be able to describe particle movement in four states of matter	Glencoe – Physical Science Chapter 16 Sec 2 Pgs 477-479 Associated PowerPoint and Worksheets		S7.C.1.2.2 S8.A.3.3.2	
	Matter has observable physical properties and the potential to mix and form new materials	What determines whether a substance is a solid, liquid or gas?	Particles are always in motion with the smallest motion in solids progressing to the largest motion in gases.	Student should be able to explain what occurs at the molecular level at the melting and boiling points of a substance.	Glencoe – Physical Science Chapter 16 Sec 2 Pgs 480-83 Associated PowerPoint and Worksheets	Melting point Heat of Fusion Boiling point Heat of Vaporization	S6.C.1.2.1 S6.C.2.1.2	
	Matter has observable physical properties and the potential	How do scientists use the behaviors of fluids in order to create new technologies?	Archimedes principle is the reason why objects such as large ships float.	Student should be able to explain Archimedes' principle	Glencoe – Physical Science Chapter 16 Sec 3 Pgs 485-486 Associated PowerPoint and	Buoyancy Density	S6.C.1.2.1 S6.C.2.1.2	Lab – Aluminum foil boat

	to mix and form new materials				Worksheets			
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists use the behaviors of fluids in order to create new technologies?	Pascal's principle is the reason why a hydraulic lift enables a man to lift large objects such as a car.	Student should be able to explain Pascal's principle	Glencoe – Physical Science Chapter 16 Sec 3 Pgs 486-487 Associated PowerPoint and Worksheets	Pressure	S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1 S8.C.3.1.3	Demo – Pascal demonstrator hydraulic lift Lab – Cartesian diver
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists use the behaviors of fluids in order to create new technologies?	Bernoulli's principle is the reason why a plane is able to take flight regardless of its weight.	Student should be able to explain Bernoulli's principle and explain how we use it.	Glencoe – Physical Science Chapter 16 Sec 3 Pgs 488-489 Associated PowerPoint and Worksheets	Viscosity	S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1 S8.C.3.1.3	Lab – Bernoulli's Kit
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists use the behaviors of fluids in order to create new technologies?	The pressure that is felt by an object is the result of the collisions between gas particles and its surface.	Student should be able to explain how a gas exerts pressure on a container	Glencoe – Physical Science Chapter 16 Sec 3 Pgs 490-491 Associated PowerPoint and Worksheets	Temperature Pressure Pascal (unit) Volume	S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1 S8.C.3.1.3	Demo – Bell glass jar (balloon, marshmallow) Demo – can crushing
	Matter has observable physical properties and the potential to mix and form new materials	How do scientists use the behaviors of fluids in order to create new technologies?	There are three variables that describe a container of gas. Any change in one of these variables will cause a change in another variable, when the third variable is	Student should be able to explain how a gas is affected when pressure, temperature, or volume is changed	Glencoe – Physical Science Chapter 16 Sec 3 Pgs 492-495 Associated PowerPoint and Worksheets	Boyle's Law Charles's Law Temperature v Pressure relationship	S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3	Review Unit 3 Assessment Unit 3

			kept constant.					
Review Unit 2 The States of Matter								
Assessment Unit 2 The States of Matter								
Unit 3 Properties of Atoms and the Periodic Table								
Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
4 weeks	Matter has observable physical properties and the potential to mix and form new materials	What are atoms made of and what is their role in determining the behaviors of the elements?	All matter is made up of building blocks called atoms. Atoms are characterized by their parts including protons, electrons, and neutrons.	Student should be able to describe the atomic structure and components of an atom	Glencoe – Physical Science Chapter 17 Sec 1 Pgs 506-507 Associated PowerPoint and Worksheets	Atom Nucleus Proton Neutron Electron Electron cloud Quark	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1 S8.A.3.3.1 S8.A.3.3.2	Activity – Read and research history of the atomic model
	Matter has observable physical properties and the potential to mix and form new materials	What are atoms made of and what is their role in determining the behaviors of the elements?	All matter is made up of building blocks called atoms. Atoms are characterized by their parts including protons, electrons, and neutrons.	Student should be able to using Bohr models, illustrate how electrons are arranged in an atom.	Glencoe – Physical Science Chapter 17 Sec 1 Pgs 508-511 Associated PowerPoint and Worksheets	Atom Nucleus Proton Neutron Electron Electron cloud Quark	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1 S8.A.3.3.1 S8.A.3.3.2	Activity – Read and research history of the atomic model
	Matter has observable physical	What are atoms made of and what is their role in	All matter is made up of building blocks called	Student should be able to relate the model of the atom	Glencoe – Physical Science Chapter 17 Sec 1 Pgs 510	Atom Nucleus Proton	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1	Activity – Read and research history of the

	properties and the potential to mix and form new materials	determining the behaviors of the elements?	atoms. Atoms are characterized by their parts including protons, electrons, and neutrons.	to technological advances.	Associated PowerPoint and Worksheets	Neutron Electron Electron cloud Quark	S8.A.3.3.1 S8.A.3.3.2	atomic model
	Matter has observable physical properties and the potential to mix and form new materials	What are atoms made of and what is their role in determining the behaviors of the elements?	All matter is made up of building blocks called atoms. Atoms are characterized by their parts including protons, electrons, and neutrons.	Student should be able to interpret the periodic table with regards to atomic number, and atomic mass.	Glencoe – Physical Science Chapter 17 Sec 2 Pgs 512-513 Associated PowerPoint and Worksheets	Atomic number Mass number	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1 S8.A.3.3.1 S8.A.3.3.2	Demo – Relative nature of particle masses
	Matter has observable physical properties and the potential to mix and form new materials	What are atoms made of and what is their role in determining the behaviors of the elements?	All matter is made up of building blocks called atoms. Atoms are characterized by their parts including protons, electrons, and neutrons.	Student should be able to determine the number of protons, neutrons, and electrons of any atom, ion or isotope.	Glencoe – Physical Science Chapter 17 Sec 2 Pgs 514-515 Associated PowerPoint and Worksheets	Isotope	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1 S8.A.3.3.1 S8.A.3.3.2	
	Matter has observable physical properties and the potential to mix and form new materials	What are atoms made of and what is their role in determining the behaviors of the elements?	There are over one hundred known elements each with characteristic properties from which all other matter is made.	Student should be able to use the periodic table to obtain information	Glencoe – Physical Science Chapter 17 Sec 3 Chapter 19 Pgs 516-524 & 570-591 Associated PowerPoint and Worksheets	Periodic Table Group Period Electron dot diagram	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1 S8.A.3.3.1 S8.A.3.3.2	Activity – Periodic table creation and organizing
	Matter has observable physical properties and	What are atoms made of and what is their role in determining the	There are over one hundred known elements each with characteristic	Student should be able to explain what the terms metal, nonmetal,	Glencoe – Physical Science Chapter 19 Pgs 570-591 Associated PowerPoint and	Metal Nonmetal Metalloid	S6.C.1.1.1 S7.C.1.1.1 S8.A.3.2.1 S8.A.3.3.1	Activity – Periodic table creation and organizing

	the potential to mix and form new materials	behaviors of the elements?	properties from which all other matter is made.	and metalloid	Worksheets		S8.A.3.3.2	
Review Unit 3 Properties of Atoms and the Periodic Table								
Assessment Unit 3 Properties of Atoms and the Periodic Table								
Unit 4 Chemical Bonds and Reactions								
Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
3 weeks	Matter has observable physical properties and the potential to mix and form new materials	Why do chemical reactions take place between two neutral atoms of different elements?	When two or more substances are combined, they may form a new substance with new properties.	Student should be able to describe how a compound differs from its component elements.	Glencoe – Physical Science Chapter 20 Pgs 602-603 Associated PowerPoint and Worksheets	Chemical bonds Chemical formulas	S7.C.1.2.1 S8.C.1.1.3 S8.A.3.1.5 S8.A.3.2.1	
	Matter has observable physical properties and the potential to mix and form new materials	Why do chemical reactions take place between two neutral atoms of different elements?	When two or more substances are combined, they may form a new substance with new properties.	Student should be able to state a reason why chemical bonding occurs.	Glencoe – Physical Science Chapter 20 Pgs 604-611 Associated PowerPoint and Worksheets	Compound	S7.C.1.2.1 S8.C.1.1.3 S8.A.3.1.5 S8.A.3.2.1	
	Matter has observable	Why do chemical reactions take	When two or more substances are	Student should be able to describe	Glencoe – Physical Science Chapter 20 Pgs 604-611	Ionic bond Covalent	S7.C.1.2.1 S8.C.1.1.3	

	physical properties and the potential to mix and form new materials	place between two neutral atoms of different elements?	combined, they may form a new substance with new properties.	ionic and covalent bonds	Associated PowerPoint and Worksheets	bond Ion Molecule	S8.A.3.1.5 S8.A.3.2.1	
	Matter has observable physical properties and the potential to mix and form new materials	Why do chemical reactions take place between two neutral atoms of different elements?	When two or more substances are combined, they may form a new substance with new properties.	Student should be able to identify the substances produced by ionic bonding and covalent bonding	Glencoe – Physical Science Chapter 20 Pgs 604-611 Associated PowerPoint and Worksheets	Ionic bond Covalent bond Ion Molecule	S7.C.1.2.1 S8.C.1.1.3 S8.A.3.1.5 S8.A.3.2.1	
	Matter has observable physical properties and the potential to mix and form new materials	Why do chemical reactions take place between two neutral atoms of different elements?	When two or more substances are combined, they may form a new substance with new properties.	Student should be able to distinguish between a nonpolar and polar covalent bonds	Glencoe – Physical Science Chapter 20 Pgs 612-614 Associated PowerPoint and Worksheets	Polar molecule Nonpolar molecule	S7.C.1.2.1 S8.C.1.1.3 S8.A.3.1.5 S8.A.3.2.1	

Review Unit 4 Chemical Bonds and Reactions

Assessment Unit 4 Chemical Bonds and Reactions

Unit 5 Motion

Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
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4 weeks	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	The motion of an object can be described by its position, direction and speed.	Student should be able to explain the difference between speed and velocity	Glencoe – Physical Science Chapter 2 Sec 1 Pgs 38-39 & 44 Associated PowerPoint and Worksheets	Distance Displacement Speed Velocity Time	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	The motion of an object can be described by its position, direction and speed	Student should be able to calculate velocity, distance and time using one step equations	Glencoe – Physical Science Chapter 2 Sec 1 Pgs 39-40 Associated PowerPoint and Worksheets	Instantaneous speed Average speed	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	The motion of an object can be described by its position, direction and speed.	Student should be able to solve problems of motion performing direct and indirect measurements of the motion of objects and performing graphical analysis of this experimental data.	Glencoe – Physical Science Chapter 2 Sec 1 Pgs 39-40 Associated PowerPoint and Worksheets	Instantaneous speed Average speed	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	Lab – Constant Motion Cart
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	Models and graphs can be used to determine the motion of an object.	Student should be able to plot and interpret velocity vs time graphs.	Glencoe – Physical Science Chapter 2 Sec 1 Pgs 41-43 Associated PowerPoint and Worksheets	Instantaneous speed Average speed	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	Activity – Graph Lab data and compare slope to calculated velocity
	An object's motion is the result of all	How are the forces acting on an object related to its	The motion of an object can be described by its	Student should be able to describe how acceleration,	Glencoe – Physical Science Chapter 2 Sec 2 Pgs 47-50	Acceleration	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2	Video – Thrill Ride

	forces acting on it.	motion?	change in speed (acceleration)	time and velocity are related.	Associated PowerPoint and Worksheets		S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	The motion of an object can be described by its change in speed (acceleration)	Student should be able to calculate the acceleration of an object from its change in velocity and time interval data.	Glencoe – Physical Science Chapter 2 Sec 2 Pgs 48-50 Associated PowerPoint and Worksheets	Acceleration	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	Newton's three laws of motion can be used to explain and measure the motion of objects.	Student should be able to explain how force and motion are related.	Glencoe – Physical Science Chapter 2 Sec 3 Pgs 52-53 Associated PowerPoint and Worksheets	Force Net force Balanced force	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	Lab – Push/Pull pg 57
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	The property inertia is an object's resistance to a change in its motion.	Student should be able to describe what inertia is and how it is related to Newton's first law of motion	Glencoe – Physical Science Chapter 2 Sec 3 Pgs 54-56 Associated PowerPoint and Worksheets	Inertia	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How are the forces acting on an object related to its motion?	The property inertia is an object's resistance to a change in its motion.	Student should be able to identify the forces and motion that are present during a car crash.	Glencoe – Physical Science Chapter 2 Sec 3 Pgs 54-56 Associated PowerPoint and Worksheets	Inertia	S6.C.3.1.1 S7.C.3.1.1 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.3 S8.C.3.1.1	Video – Car Crash (Erie Insurance)

Review Unit 5 Motion

Assessment Unit 5 Motion

Unit 6 Forces

Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
4 weeks	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Pushes, pulls, friction, and gravity are forces that can act upon an object to change its position, direction, and/or speed.	Student should be able to define Newton's second law of motion	Glencoe – Physical Science Chapter 3 Sec 1 Pgs 68-70 Associated PowerPoint and Worksheets	Newton's second law of motion Friction	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Solve problems of motion and forces by: applying knowledge of Newton's Laws; performing direct and indirect measurements of the motion of objects and the forces acting upon them; and performing graphical analysis of this experimental data.	Student should be able to apply Newton's second law of motion.			S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Friction is a force that can act upon an object to change its position, direction, and/or speed.	Student should be able to describe the 3 different types of friction.	Glencoe – Physical Science Chapter 2 Sec 2 Pgs 70-73 Associated PowerPoint and Worksheets	Static friction Sliding friction Rolling friction	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Lab – 5 board friction kit

	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Friction is a force that can act upon an object to change its position, direction, and/or speed.	Student should be able to observe the effects of air resistance on falling objects	Glencoe – Physical Science Chapter 2 Sec 1 Pgs 73-74 Associated PowerPoint and Worksheets	Air resistance	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Demo – Paper sheet vs Paper ball
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Weight is the result of the earth's gravitational force acting upon an object's mass.	Student should be able to describe gravitational force and the two factors that affect it: distance and size.	Glencoe – Physical Science Chapter 3 Sec 2 Pgs 75-79 Associated PowerPoint and Worksheets	Gravity Weight Free fall	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Video – Invisible Force
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Weight is the result of the earth's gravitational force acting upon an object's mass.	Student should be able to distinguish between mass and weight.	Glencoe – Physical Science Chapter 3 Sec 2 Pgs 75-79 Associated PowerPoint and Worksheets	Gravity Weight Free fall	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Activity – Gravity around the solar system Demo – Free Fall and Weightlessness
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Weight is the result of the earth's gravitational force acting upon an object's mass.	Student should be able to explain why objects that are thrown will follow a curved path.	Glencoe – Physical Science Chapter 3 Sec 2 Pgs 79-80 Associated PowerPoint and Worksheets	Projectile motion	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Weight is the result of the earth's gravitational force acting upon an object's mass.	Student should be able to compare circular motion with motion in a straight line.	Glencoe – Physical Science Chapter 3 Sec 2 Pgs 81-82 Associated PowerPoint and Worksheets	Centripetal acceleration Centripetal force	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Demo – Flying Pig
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the	Newton's third law of motion can be used to explain natural phenomena such as why a	Student should be able to state Newton's third law of motion	Glencoe – Physical Science Chapter 3 Sec 3 Pgs 83-85 Associated PowerPoint and	Newton's third law of motion	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3	

		motion of objects?	rower pushes water backward in order to move forward.		Worksheets		S8.C.3.1.1	
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Newton's third law of motion can be used to explain natural phenomena such as why a rower pushes water backward in order to move forward.	Student should be able to identify action reaction pairs.	Glencoe – Physical Science Chapter 3 Sec 3 Pgs 83-85 Associated PowerPoint and Worksheets	Newton's third law of motion	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Activity – Newton's 3 laws poster
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Solve problems of motion and forces by: applying knowledge of Newton's Laws; performing direct and indirect measurements of the motion of objects and the forces acting upon them; and performing graphical analysis of this experimental data.	Student should be able to calculate momentum.	Glencoe – Physical Science Chapter 3 Sec 3 Pgs 86-88 Associated PowerPoint and Worksheets	Momentum	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Demo – Newton's Cradle Demo – Air Track
	An object's motion is the result of all forces acting on it.	How can Newton's laws be used to analyze and predict changes in the motion of objects?	Solve problems of motion and forces by: applying knowledge of Newton's Laws; performing direct and indirect measurements of the motion of	Student should be able to recognize when momentum is conserved.	Glencoe – Physical Science Chapter 3 Sec 3 Pgs 86-88 Associated PowerPoint and Worksheets	Momentum	S6.C.3.1.2 S7.C.3.1.2 S8.A.3.2.1 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.1	Lab – Collision carts

			objects and the forces acting upon them; and performing graphical analysis of this experimental data.					
Review Unit 6 Forces								
Assessment Unit 6 Forces								
Unit 7 Energy								
Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
4 Weeks	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	How is energy transferred between objects and converted into different forms?	Energy can take many different forms including mechanical, thermal, chemical, and electromagnetic.	Student should be able to distinguish between kinetic and potential energy.	Glencoe – Physical Science Chapter 4 Sec 1 Pgs 100-103 Associated PowerPoint and Worksheets	Kinetic energy Joule Potential Energy	S7.C.2.1.2 S8.C.2.1.1 S8.C.2.1.3 S8.C.3.1.2	Lab – Interpreting data from a slingshot pg 103

	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	How is energy transferred between objects and converted into different forms?	Energy can take many different forms including mechanical, thermal, chemical, and electromagnetic.	Student should be able to describe different forms of potential energy.	Glencoe – Physical Science Chapter 4 Sec 1 Pgs 103-104 Associated PowerPoint and Worksheets	Elastic potential energy Chemical potential energy	S7.C.2.1.2 S8.C.2.1.1 S8.C.2.1.3 S8.C.3.1.2	Demo – Energy cycle
	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	How is energy transferred between objects and converted into different forms?	The energy of an object in motion above the earth has both kinetic and potential energies.	Student should be able to calculate the kinetic and potential energy of an object at a specific speed and position above the earth.	Glencoe – Physical Science Chapter 4 Sec 2 Pgs 107-110 Associated PowerPoint and Worksheets	Gravitational potential energy	S7.C.2.1.2 S8.C.2.1.1 S8.C.2.1.3 S8.C.3.1.2	Lab – Ball drop
	Energy is neither created nor destroyed. Energy can be transformed from one form	How is energy transferred between objects and converted into different forms?	Describe sources and forms of energy and explain their transformations.	Student should be able to describe how energy can be transformed from one form to another.	Glencoe – Physical Science Chapter 4 Sec 2 Pgs 107-110 Associated PowerPoint and Worksheets	Gravitational potential energy	S7.C.2.1.2 S8.C.2.1.1 S8.C.2.1.3 S8.C.3.1.2	

	to another, but transformation between forms often results in the loss of useable energy through the production of heat.							
	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	How is energy transferred between objects and converted into different forms?	Describe sources and forms of energy and explain their transformations.	Student should be able to describe how the potential energy of an object can turn into kinetic energy and vice versa.	Glencoe – Physical Science Chapter 4 Sec 2 Pgs 107-110 Associated PowerPoint and Worksheets	Mechanical energy	S7.C.2.1.2 S8.C.2.1.1 S8.C.2.1.3 S8.C.3.1.2	Demo – Pendulum of Faith
	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy	How is energy transferred between objects and converted into different forms?	Energy is conserved.	Student should be able to discuss the law of conservation of energy	Glencoe – Physical Science Chapter 4 Sec 2 Pgs 111-115 Associated PowerPoint and Worksheets	Law of conservation of energy	S7.C.2.1.2 S8.C.2.1.1 S8.C.2.1.3 S8.C.3.1.2	Demo – Mass is energy “Nuclear Power” Activity – Calorie tracker

	through the production of heat.							
Review Unit 7 Energy								
Assessment Unit 7 Energy								
Unit 8 Simple Machines								
Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
3 Weeks	A simple machine is a system that has work done on it. It, in turn, does work on an object or another system.	How do simple machines decrease the effort necessary for a person to do work?	Simple machines help accomplish a task with less effort by either changing the direction of motion or increasing the mechanical advantage.	Student should be able to describe how work and energy are related.	Glencoe – Physical Science Chapter 5 Sec 1 Pgs 126-127 Associated PowerPoint and Worksheets	Work Power	S7.C.3.1.3 S8.A.3.1.1 S8.A.3.1.3 S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.3	Lab – People Power Activity – Electric bill/graph poster
	A simple machine is a system that has work done on it. It, in turn, does work on an object or another	How do simple machines decrease the effort necessary for a person to do work?	Simple machines help accomplish a task with less effort by either changing the direction of motion or increasing the mechanical advantage.	Student should be able to calculate the work and power done when a force makes an object move.	Glencoe – Physical Science Chapter 5 Sec 1 Pgs 128-130 Associated PowerPoint and Worksheets	Work Power	S7.C.3.1.3 S8.A.3.1.1 S8.A.3.1.3 S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.3	

	system.							
	A simple machine is a system that has work done on it. It, in turn, does work on an object or another system.	How do simple machines decrease the effort necessary for a person to do work?	Simple machines help accomplish a task with less effort by either changing the direction of motion or increasing the mechanical advantage.	Student should be able to explain how machines make doing “work” easier.	Glencoe – Physical Science Chapter 5 Sec 2 Pgs 132-135 Associated PowerPoint and Worksheets	Input force Output force Mechanical advantage	S7.C.3.1.3 S8.A.3.1.1 S8.A.3.1.3 S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.3	Demo – The lever arm
	A simple machine is a system that has work done on it. It, in turn, does work on an object or another system.	How do simple machines decrease the effort necessary for a person to do work?	Simple machines help accomplish a task with less effort by either changing the direction of motion or increasing the mechanical advantage.	Student should be able to calculate the mechanical advantage of a machine.	Glencoe – Physical Science Chapter 5 Sec 2 Pgs 136 Associated PowerPoint and Worksheets	Mechanical advantage	S7.C.3.1.3 S8.A.3.1.1 S8.A.3.1.3 S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.3	Lab – Work with ramps
	A simple machine is a system that has work done on it. It, in turn, does work on an object or another system.	How do simple machines decrease the effort necessary for a person to do work?	Simple machines help accomplish a task with less effort by either changing the direction of motion or increasing the mechanical advantage.	Student should be able to calculate the efficiency of a machine.	Glencoe – Physical Science Chapter 5 Sec 2 Pgs 137 Associated PowerPoint and Worksheets	Efficiency	S7.C.3.1.3 S8.A.3.1.1 S8.A.3.1.3 S8.A.3.1.5 S8.A.3.2.2 S8.A.3.2.3 S8.C.3.1.3	
	A simple machine is a system that has work done on it. It, in	How do simple machines decrease the effort necessary for a person to do	Simple machines help accomplish a task with less effort by either changing the direction of	Student should be able to apply mechanical advantage to the six different types of	Glencoe – Physical Science Chapter 5 Sec 3 Pgs 138-146 Associated PowerPoint and Worksheets	Lever Pulley Block and tackle Wheel and	S7.C.3.1.3 S8.A.3.1.1 S8.A.3.1.3 S8.A.3.1.5 S8.A.3.2.2	Lab – Pulley systems pg 149 Lab – Lever pg 147

	turn, does work on an object or another system.	work?	motion or increasing the mechanical advantage.	simple machines.		axle Inclined plane Screw Wedge	S8.A.3.2.3 S8.C.3.1.3	
Review Unit 8 Simple Machines								
Assessment Unit 8 Simple Machines								
Unit 9 Thermal Energy								
Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
3 Weeks	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	How is thermal energy transferred from a warmer to a cooler object?	Energy can be transformed within a system or transferred from one system to another (or from a system to its environment) in different ways. Thermal energy is transferred from warmer objects to cooler objects.	Student should be able to describe the Sun as the major source of energy that impacts the environment.	Glencoe – Physical Science Chapter 6 Sec 1 Pgs 158-163 Associated PowerPoint and Worksheets	Temperature Thermal energy Heat Specific heat	S6.C.2.1.1 S6.C.2.1.3 S8.A.3.1.1 S8.A.3.1.2 S8.A.3.1.3 S8.A.3.2.2 S8.C.2.1.1 S8.C.2.1.2 S8.C.2.1.3 S8.C.2.2.1 S8.C.2.2.2	
	Energy is neither created	How is thermal energy	Energy can be transformed within	Student should be able to explain how	Glencoe – Physical Science Chapter 6 Sec 2	Conduction Convection	S6.C.2.1.1 S6.C.2.1.3	Lab: convection

Unit 10 Electricity and Magnetism

Estimated Time Frame for unit	Big Ideas	Essential Question	Concept (Know)	Competency (Do)	Suggested Resources	Vocabulary	PA Content / Keystone Standard	Suggested Lessons & Activities
3 weeks	An object's motion is the result of all forces acting on it.	What causes objects to move?	Two of the fundamental forces that exist in the universe are gravity and electromagnetism.	Describe how electric charges exert forces on each other.	Glencoe – Physical Science Chapter 7 Sec 1 Pgs 192-199 Associated PowerPoint and Worksheets	Static electricity Law of conservation of charge Conductor Insulator Charging by contact Charging by induction	S6.C.3.2.1 S6.C.3.2.2 S6.C.3.2.3 S6.C.2.1.3 S8.A.3.1.4 S8.C.2.1.1 S8.C.2.1.2 S8.C.2.1.3 S8.C.2.2.1	Activity: Changes (page 193);
	An object's motion is the result of all forces acting on it.	What causes objects to move?	Two of the fundamental forces that exist in the universe are gravity and electromagnetism.	Explain how objects become electrically charged.	Glencoe – Physical Science Chapter 7 Sec 1 Pgs 192-199 Associated PowerPoint and Worksheets	Static electricity Law of conservation of charge Conductor Insulator Charging by contact Charging by induction	S6.C.3.2.1 S6.C.3.2.2 S6.C.3.2.3 S6.C.2.1.3 S8.A.3.1.4 S8.C.2.1.1 S8.C.2.1.2 S8.C.2.1.3 S8.C.2.2.1	Minilab: investigate charged objects (page 198)
	Energy is neither created nor destroyed. Energy can be	How do energy transformations explain that energy is neither created nor	Batteries store chemical energy and transform it into electrical energy.	Describe how voltage difference causes current to flow.	Glencoe – Physical Science Chapter 7 Sec 2 Pgs 200-205 Associated PowerPoint and	Electric current Voltage difference Circuit	S6.C.3.2.1 S6.C.3.2.2 S6.C.3.2.3 S6.C.2.1.3 S8.A.3.1.4	Minilab: investigate battery addition (page 202)

	transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	destroyed?			Worksheets	Resistance Ohm's law	S8.C.2.1.1 S8.C.2.1.2 S8.C.2.1.3 S8.C.2.2.1	
	Energy is neither created nor destroyed. Energy can be transformed from one form to another, but transformation between forms often results in the loss of useable energy through the production of heat.	How do energy transformations explain that energy is neither created nor destroyed?	Batteries store chemical energy and transform it into electrical energy.	Explain how batteries produce a voltage difference in a circuit.	Glencoe – Physical Science Chapter 7 Sec 2 Pgs 200-205 Associated PowerPoint and Worksheets		S6.C.3.2.1 S6.C.3.2.2 S6.C.3.2.3 S6.C.2.1.3 S8.A.3.1.4 S8.C.2.1.1 S8.C.2.1.2 S8.C.2.1.3 S8.C.2.2.1	Lab: identifying conductors and insulators (page 206)
	Energy is neither created nor	How do energy transformations explain that	Electromagnetic energy can be transferred when	Describe the difference between series and parallel	Glencoe – Physical Science Chapter 7 Sec 3 Pgs 207-213	Series circuit Parallel circuit	S6.C.3.2.1 S6.C.3.2.2 S6.C.3.2.3	Activity: examine circuits (page 208)

