8th Grade Physical Science GSE Curriculum Map
Adopted May 2017

1st Quarter (10 weeks total)	2nd Quarter (8.5 weeks total)		3rd Quarter (10 weeks total)		4th Quarter (8.5 weeks total)
Unit 1: S8P1 - Nature of Matter 9 weeks **S8P2 - Energy and its transformation** 1 week	**Unit 2: S8P2 - Energy and its Transformation** 3 weeks	**S8P3 - Forces & Motion** **S8P5a - Forces Acting in Nature** 5 weeks	**S8P5 - Forces Acting in Nature (Electricity and Magnetism)** 3 weeks	**S8P4 - Waves** 7 weeks	Milestones Review Life Skills Extension or Preview Activities STEM/STEAM/STREAM
Standards and Elements					
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter. a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures. *(Clarification statement: Include heterogeneous and homogeneous mixtures. Types of bonds and compounds will be addressed in high school physical science.)* b. Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed. c. Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical (i.e., density, melting point, boiling point) properties of matter. d. Construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical. *(Clarification statement: Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.)* e. Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (protons, neutrons, and electrons) and simple molecules. f. Construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants. *(Clarification statement: Evidence could include models such as balanced chemical equations.)*	**S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system.** a. Analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object. b. Plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller coasters, pendulums, rubber bands, etc.). c. Construct an argument to support a claim about the type of energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]. d. Plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection).	**S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.** a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (Clarification statement: Students should be able to analyze motion graphs, but students should not be expected to calculate velocity or acceleration.) b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object. c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia). S8P5. Obtain, evaluate, and communicate information about gravity, electricity, and magnetism as major forces acting in nature. a. Construct an argument using evidence to support the claim that fields (i.e., magnetic fields, gravitational fields, and electric fields) exist between objects exerting forces on each other even when the objects are not in contact.	**S8P5. Obtain, evaluate, and communicate information about gravity, electricity, and magnetism as major forces acting in nature.** a. Construct an argument using evidence to support the claim that fields (i.e., magnetic fields, gravitational fields, and electric fields) exist between objects exerting forces on each other even when the objects are not in contact. b. Plan and carry out investigations to demonstrate the distribution of charge in conductors and insulators. (Clarification statement: Include conduction, induction, and friction.) c. Plan and carry out investigations to identify the factors (e.g., distance between objects, 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) that affect the strength of electric and magnetic forces. (Clarification statement: Including, but not limited to, generators or motors.)	**S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves.** a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves. (Clarification statement: Include transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions.) b. Construct an explanation using data to illustrate the relationship between the electromagnetic spectrum and energy. c. Design a device to illustrate practical applications of the electromagnetic spectrum (e.g., communication, medical, military). d. Develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials. (Clarification statement: Include echo and how color is seen but do not cover interference and scattering.) e. Analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed). f. Develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, and wavelength) and energy. g. Develop and use models to demonstrate the effects that lenses have on light (i.e., formation an image) and their possible technological applications.	
**** See Math Connections within STEMScopes (Elements within STEMscopes are DIFFERENT than the GSE) ****					
Math Connections: Matter unit focus on metric system, precision, and accuracy. S8P1f. Understanding how to detremine if the chemical equation is balanced; # reactants = # products	Math Connections S8P3a. Understand and interpret graphs to determine relationships between factors. (emphasize trends)	Math Connections S8P3a. Understand and interpret graphs to determine relationships between factors. (emphasize trends). Looking at the units of measurement within forces and motion.		Math Connections S8P4. Direct and Inverse Relationships in Wave Properties. Light frequencies uses scientific notation.	
Vocabulary of the Standards					
pure substances elements compounds mixtures (heterogeneous, homogeneous)	law of conservation of energy kinetic energy mass speed	speed distance velocity acceleration	gravity electricity magnetic fields gavitational fields	electromagnetic (light) waves mechanical waves sound waves transverse waves	see individual lessons for life skills vocabulary

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particles	prtential energy	force	electric fields	longitudinal waves	
solids	energy transformations	mass	charges	crest	
liquids	conduction	Newton's laws of motion	conductors	trough	
gases	radiation	inertia	insulators	compressions	
plasma	convection	balanced forces	conduction	rarefactions	
thermal energy	elastic potential energy	unbalanced forces	induction	electromagnetic spectrum	
reactivity	gravitational potential energy	gravity	friction	energy	
combustibility		electricity	magnetic force	reflection	
density		magnetic fields	electromagnets	refraction	
melting point		gavitational fields	generators	absorption	
boiling point		electric fields	motors	diffraction	
matter				transmission	
chemical properties				echo	
physical properties				interference	
atoms				scattering	
moleclues				frequency	
periodic table				amplitude	
protons				wavelength	
neutrons				lenses	
electrons					
products					
reactants					

Options to Introduce: During Nature of Matter (S8P1) Introduce: Thermal energy, kinetic energy. During Energy & Its Transformation (S8P2) Introduce: Radiant energy, electromagnetic waves, mechanical waves