Cobb County School District 2019-2020

8th Grade Physical Science Teaching & Learning Framework

Quarter 1	Quarter 2		Quarter 3		Quarter 4	
Unit 1 **9 weeks**	**Unit 2** **3 weeks**	**Unit 3** **3 weeks**	**Unit 4** **5 weeks**	**Unit 5** **9 weeks**	**Test Prep** **3 weeks**	**Extension** **4 weeks**
Nature of Matter	**Forms and Transformations of Energy**	**Electricity and Magnetism**	**Nature of Waves**	**Forces and Motion**	**Test Prep**	**Extension**
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. 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. 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.	**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).	**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. 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.	**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. 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. 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.	**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).		
AC Extension: Obtain, evaluate, and communicate information from the Periodic Table to explain the relative properties of elements based on patterns of atomic structure. a. Develop and use models to compare and contrast the structure of atoms, ions and isotopes. (SPS1)	**AC Extension: Obtain, evaluate, and communicate information to explain transformations and flow of energy within a system** c. Analyze and interpret specific heat data to justify the selection of a material for a practical application (e.g., insulators and cooking vessels). (SPS7)	**AC Extension: Obtain, evaluate, and communicate information to explain the properties of and relationships between electricity and magnetism.** c. Plan and carry out investigations to determine the relationship between magnetism and the movement of electrical charge. (Clarification statement: Investigations could include electromagnets, simple motors, and generators.) (SPS10)	**AC Extension: Obtain, evaluate, and communicate information to explain the properties of waves.** e. Develop and use models to explain the changes in sound waves associated with the Doppler Effect. (SPS9)	**AC Extension: Obtain, evaluate, and communicate information to explain the relationships among force, mass, and motion**. a. Plan and carry out an investigation and analyze the motion of an object using mathematical and graphical models (SPS8)		