Physical Science Pacing Guide 2022-23

Unit Name	**New GSE Standards**	**Learning Targets**	**Days to teach unit**
Intro to Physical Science	All standards	LT0.1 -I can make inferences about my science teacher based on his classroom.	2-3 days
Unit 1 Matter	**SPS5.** Obtain, evaluate, and communicate information to compare and contrast the phases of matter as they relate to atomic and molecular motion. **a.** Ask questions to compare and contrast models depicting the particle arrangement and motion in solids, liquids, gases, and plasmas. **b.** Plan and carry out investigations to identify the relationships among temperature, pressure, volume, and density of gases in closed systems.	LT1- I can describe the difference between physical and chemical properties. LT2- I can describe the difference between physical and chemical changes. LT3- I can describe the 6 changes of state (*melting*, *sublimation*, *vaporization*, *condensation*, *deposition*, and *freezing*) in terms of what happens to the energy and spacing of the particles. LT4- I can find the melting and boiling points on a change of state graph.	6-8 days
Unit 2 Atoms and The Periodic Table	**SPS1.** 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. (Clarification statement: Properties include atomic number, atomic mass and the location and charge of subatomic particles.) **b.** Analyze and interpret data to determine trends of the	LT1: I can describe how elements are arranged on the periodic table. LT2: I can explain why elements in the same group share similar properties. LT3: I can calculate the particles of an element's atoms (protons, neutrons, and electrons) using a periodic table.	10 days

	following: ● Number of valence electrons ● Types of ions formed by main group elements ● Location and properties of metals, nonmetals, and metalloids ● Phases at room temperature **c.** Use the Periodic Table as a model to predict the above properties of main group elements.	LT4:I can calculate the average atomic mass of an element.	
Unit 3 Bonding	**SPS2.** Obtain, evaluate, and communicate information to explain how atoms bond to form stable compounds. **a.** Analyze and interpret data to predict properties of ionic and covalent compounds. (Clarification statement: Properties are limited to types of bonds formed, elemental composition, melting point, boiling point, and conductivity.) **b.** Develop and use models to predict formulas for stable, binary ionic compounds based on balance of charges. **c.** Use the International Union of Pure and Applied Chemistry (IUPAC) nomenclature for translating between chemical names and chemical formulas. (Clarification statement: Limited to binary covalent and binary ionic, containing main group elements, compounds but excludes polyatomic ions.)	LT1: I can describe chemical bonding. LT2: I can identify the number of valence electrons in an atom. LT3: I can describe the properties associated with ionic, covalent, and metallic bonds.	4-5 days
Unit 4 Chemical Reactions and Law of Conservation of Mass	**SPS3.** Obtain, evaluate, and communicate information to support the Law of Conservation of Matter. **a.** Plan and carry out investigations to generate evidence supporting the claim that mass is conserved during a chemical reaction. (Clarification statement: Limited to synthesis, decomposition, single replacement, and double replacement reactions.) **b.** Develop and use a model of a chemical equation to illustrate how the total number of atoms is conserved during a chemical reaction. (Clarification statement: Limited to chemical equations that	LT1: I can compare and contrast endothermic and exothermic reactions. LT2: I can describe the factors that affect a chemical reaction. LT3: I can identify the parts (*coefficients, subscripts, products, reactants,* and *yields*) of a chemical equation.	5-7 days

	include binary ionic and covalent compounds and will not include equations containing polyatomic ions.)		
Unit 5 Solutions, Acids and Bases	**SPS6.** Obtain, evaluate, and communicate information to explain the properties of solutions. **a.** Develop and use models to explain the properties (solute/solvent, conductivity, and concentration) of solutions. **b.** Plan and carry out investigations to determine how temperature, surface area, and agitation affect the rate solutes dissolve in a specific solvent. **c.** Analyze and interpret data from a solubility curve to determine the effect of temperature on solubility. **d.** Obtain and communicate information to explain the relationship between the structure and properties (e.g., pH, and color change in the presence of an indicator) of acids and bases. (Clarification statement: Limited to only the structure of simple acids and bases (e.g., HCl and NaOH) that demonstrates the presence of an H+ or OH-. **e.** Plan and carry out investigations to detect patterns in order to classify common household substances as acidic, basic, or neutral.	LT1: I can read and interpret solubility curves. LT2: I can distinguish the difference between an Acid and a Base	7-10 days
Unit 6 Force and Motion	**SPS8.** Obtain, evaluate, and communicate information to explain the relationships among force, mass, and motion. **a.** Plan and carry out an investigation to analyze the motion of an object using mathematical and graphical models. (Clarification statement: Mathematical and graphical models could include distance, displacement, speed, velocity, time and acceleration.) **b.** Construct an explanation based on experimental evidence to support the claims presented in Newton's three laws of motion. (Clarification statement: Evidence could demonstrate relationships among force, mass, velocity, and acceleration.) **c.** Analyze and interpret data to identify the relationship between mass and gravitational force for falling objects. **d.** Use mathematics and computational thinking to identify the relationships between work, mechanical advantage, and simple	LTG1: I can calculate the average speed and acceleration. LTG2: I can compare balanced and unbalanced forces. LTG3: I can state and apply Newton's Laws of Motion to real life situations.	8-11 days

	machines.		
Unit 7 Energy, Work and Simple Machines	**SPS7.** Obtain, evaluate, and communicate information to explain transformations and flow of energy within a system. **a.** Construct explanations for energy transformations within a system. (Clarification statement: Types of energy to be addressed include chemical, mechanical, electromagnetic, light, sound, thermal, electrical, and nuclear.) **b.** Plan and carry out investigations to describe how molecular motion relates to thermal energy changes in terms of conduction, convection, and radiation. **c.** Analyze and interpret specific heat data to justify the selection of a material for a practical application (e.g., insulators and cooking vessels). **d.** Analyze and interpret data to explain the flow of energy during phase changes using heating/cooling curves. **SPS8.** Obtain, evaluate, and communicate information to explain the relationships among force, mass, and motion. **d.** Use mathematics and computational thinking to identify the relationships between work, mechanical advantage, and simple machines.	LT1: I can show transformation of potential and kinetic energy LT2: I can describe how different forms of energy can be transferred LT3: In can identify all the different types of simple machines.	5-7 days
Unit 8 Electricity and Magnetism	**SPS10.** Obtain, evaluate, and communicate information to explain the properties of and relationships between electricity and magnetism. **a.** Use mathematical and computational thinking to support a claim regarding relationships among voltage, current, and resistance. **b.** Develop and use models to illustrate and explain the conventional flow (direct and alternating) of current and the flow of electrons in simple series and parallel circuits. (Clarification	LT1: I can calculate (Resistance, Voltage, Amperage) using Ohm's Law. LT2: I can give examples of conductors and insulators. LT3: I can tell the difference between a series and a parallel circuit. LT4: I can describe how magnetic poles interact.	5-9 day

	statement: Advantages and disadvantages of series and parallel circuits should be addressed.) **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.)		
Unit 9 Waves	**SPS9.** Obtain, evaluate, and communicate information to explain the properties of waves. **a.** Analyze and interpret data to identify the relationships among wavelength, frequency, and energy in electromagnetic waves and amplitude and energy in mechanical waves. **b.** Ask questions to compare and contrast the characteristics of electromagnetic and mechanical waves. **c.** Develop models based on experimental evidence that illustrate the phenomena of reflection, refraction, interference, and diffraction. **d.** Analyze and interpret data to explain how different media affect the speed of sound and light waves. **e.** Develop and use models to explain the changes in sound waves associated with the Doppler Effect.	LT1- I can tell the difference between transverse and longitudinal waves. LT2- I can describe properties of waves (Wavelength, Frequency, Amplitude, and Period). LT3- I can tell the difference between reflection and refraction	10 days
REVIEW	All Standards		5 days
Final	All Standards		1 day