Physical Science Pacing Guide 2023-24

| **Unit Name** | **New GSE** [**Standards**](https://www.georgiastandards.org/Georgia-Standards/Documents/Science-Physical-Science-Georgia-Standards.pdf) | **Learning Targets** | **Days to teach unit** |
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| 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 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. | 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.  LT4:I can calculate the average atomic mass of an element. | 10 days |
| 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 include binary ionic and covalent compounds and will not include equations containing polyatomic ions.) | 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 |
| 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 machines. | 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 |
| 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 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.) | 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 |
| 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 |