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** |
| --- | --- | --- | --- |
| 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 2Atoms 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 3Bonding | **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 4Chemical 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 5Solutions, 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 6Force 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 7Energy, 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 energyLT2: 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 8Electricity 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 9Waves | **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 |