Georgia Science

Physical Science

Adopted 2016

Obtain, evaluate, and communicate information from the Periodic Table to explain the relative properties of elements based on patterns of atomic structure. SPS1

a. **Develop and use models to compare and contrast the structure of atoms, ions and isotopes.** SPS1.A

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
** SPS1.B

c. **Use the Periodic Table as a model to predict the above properties of main group elements.** SPS1.C

Obtain, evaluate, and communicate information to explain how atoms bond to form stable compounds. SPS2

a. **Analyze and interpret data to predict properties of ionic and covalent compounds.** SPS2.A

b. **Develop and use models to predict formulas for stable, binary ionic compounds based on balance of charges.** SPS2.B

c. **Use the International Union of Pure and Applied Chemistry (IUPAC) nomenclature for translating between chemical names and chemical formulas.** SPS2.C

Obtain, evaluate, and communicate information to support the Law of Conservation of Matter. SPS3

a. **Plan and carry out investigations to generate evidence supporting the claim that mass is conserved during a chemical reaction.** SPS3.A

b. **Develop and use a model of a chemical equation to illustrate how the total number of atoms is conserved during a chemical reaction.** SPS3.B

Obtain, evaluate, and communicate information to explain the changes in nuclear structure as a result of fission, fusion and radioactive decay. SPS4

a. **Develop a model that illustrates how the nucleus changes as a result of fission and fusion.** SPS4.A

b. **Use mathematics and computational thinking to explain the process of half-life as it relates to radioactive decay.** SPS4.B

c. **Construct arguments based on evidence about the applications, benefits, and problems of nuclear energy as an alternative energy source.** SPS4.C

Obtain, evaluate, and co inf and contrast the phases

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a. **Ask questions to compare and contrast models depicting the particle arrangement and motion in solids, liquids, gases, and plasmas.** SPS5.A

of matter as they relate to atomic and molecular motion. SPS5	**b. Plan and carry out investigations to identify the relationships among temperature, pressure, volume, and density of gases in closed systems.** SPS5.B
Obtain, evaluate, and communicate information to explain the properties of solutions. SPS6	**a. Develop and use models to explain the properties (solute/solvent, conductivity, and concentration) of solutions.** SPS6.A
	b. Plan and carry out investigations to determine how temperature, surface area, and agitation affect the rate solutes dissolve in a specific solvent. SPS6.B
	c. Analyze and interpret data from a solubility curve to determine the effect of temperature on solubility. SPS6.C
	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. SPS6.D
	e. Plan and carry out investigations to detect patterns in order to classify common household substances as acidic, basic, or neutral. SPS6.E
Obtain, evaluate, and communicate information to explain transformations and flow of energy within a system. SPS7	**a. Construct explanations for energy transformations within a system.** SPS7.A
	b. Plan and carry out investigations to describe how molecular motion relates to thermal energy changes in terms of conduction, convection, and radiation. SPS7.B
	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.C
	d. Analyze and interpret data to explain the flow of energy during phase changes using heating/cooling curves. SPS7.D
Obtain, evaluate, and communicate information to explain the relationships among force, mass, and motion. SPS8	**a. Plan and carry out an investigation and analyze the motion of an object using mathematical and graphical models.** SPS8.A
	b. Construct an explanation based on experimental evidence to support the claims presented in Newton's three laws of motion. SPS8.B
	c. Analyze and interpret data to identify the relationship between mass and gravitational force for falling objects. SPS8.C
	d. Use mathematics and computational thinking to identify the relationships between work, mechanical advantage, and simple machines. SPS8.D
Obtain, evaluate, and communicate inf th wa SPS9	**a. Analyze and interpret data to identify the relationships among wavelength, frequency, and energy in electromagnetic waves and amplitude and energy in mechanical waves.** SPS9.A

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	b. Ask questions to compare and contrast the characteristics of electromagnetic and mechanical waves. SPS9.B
	c. Develop models based on experimental evidence that illustrate the phenomena of reflection, refraction, interference, and diffraction. SPS9.C
	d. Analyze and interpret data to explain how different media affect the speed of sound and light waves. SPS9.D
	e. Develop and use models to explain the changes in sound waves associated with the Doppler Effect. SPS9.E
Obtain, evaluate, and communicate information to explain the properties of and relationships between electricity and magnetism. SPS10	**a.** Use mathematical and computational thinking to support a claim regarding relationships among voltage, current, and resistance. SPS10.A
	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. SPS10.B
	c. Plan and carry out investigations to determine the relationship between magnetism and the movement of electrical charge. SPS10.C