



High School Teaching and Learning

2022-2023 Scope and Sequence

Physical Science

Physical Science	OVERVIEW
	Physical science introduces chemistry and physics and provides an understanding of the interactions of matter and energy. Through lab experiences, students collect and mathematically analyze data involving the classes of matter, chemical equations, Newton's Laws, thermodynamics, light, electricity, nuclear energy, and scientific technology.

UNIT	UNIT DURATION	PARENT/FAMILY RESOURCES	NORTH CAROLINA STANDARDS
Properties of Matter	Approximately 5 days	Density States of Matter Solids, Liquids, and Gases Changes of State	PSc.2.1 Understand types, properties, and structure of matter. PSc.2.1.1 Classify matter as homogeneous or heterogeneous; pure substance or mixture; element or compound; metals, nonmetals, or metalloids; solution, colloid, or suspension. PSc.2.1.2 Explain the phases of matter and the physical changes that matter undergoes. PSc.2.1.3 Compare physical and chemical properties of various types of matter.
Atomic Structure and Properties	Approximately 10 days	Build and Atom Isotopes and Atomic Mass The Periodic Table	PSc.2.1 Understand types, properties, and structure of matter. PSc.2.1.4 Interpret the data presented in the Bohr model diagrams and dot diagrams for atoms and ions of elements 1 through 18. PSc.2.2 Understand chemical bonding and chemical interactions. PSc.2.2.1 Infer valence electrons, oxidation number, and reactivity of an element based on its location in the Periodic Table.
Chemical Bonding	Approximately 10 days	Build a Molecule The Periodic Table	PSc.2.2 Understand chemical bonding and chemical interactions. PSc.2.2.2 Infer the type of chemical bond that occurs, whether covalent, ionic, or metallic, in a given substance. PSc.2.2.3 Predict chemical formulas and names for simple compounds based on knowledge of bond formation and naming conventions
Chemical Equations / Reactions	Approximately 5 days	Balancing Chemical Equations Reactants, Products, and Leftovers	PSc.2.2 Understand chemical bonding and chemical interactions. PSc.2.2.4 Exemplify the law of conservation of mass by balancing chemical equations. PSc.2.2.5 Classify types of reactions such as synthesis, decomposition, single replacement, or double replacement.
Solutions Acids / Bases	Approximately 2-3 days	Acid-Base Solutions Concentration pH Scale: Basics	PSc.2.2 Understand chemical bonding and chemical interactions. PSc.2.2.6 Summarize the characteristics and interactions of acids and bases.



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Radioactivity	Approximately 2-3 days	Alpha Decay Beta Decay Radioactive Dating	PSc.2.3 Understand the role of the nucleus in radiation and radioactivity. PSc.2.3.1 Compare nuclear reactions including: alpha decay, beta decay, and gamma decay; nuclear fusion and nuclear fission. PSc.2.3.2 Exemplify the radioactive decay of unstable nuclei using the concept of half-life.
Motion, Speed, and Velocity	Approximately 5 days	The Moving Man	PSc.1.1 Understand motion in terms of speed, velocity, acceleration, and momentum. PSc.1.1.1 Explain motion in terms of frame of reference, distance, and displacement. PSc.1.1.2 Compare speed, velocity, acceleration, and momentum using investigations, graphing, scalar quantities, and vector quantities.
Acceleration and Forces	Approximately 5 days	Forces and Motion: Basic Friction Gravity Force	PSc.1.1 Understand motion in terms of speed, velocity, acceleration, and momentum. PSc.1.1.2 Compare speed, velocity, acceleration, and momentum using investigations, graphing, scalar quantities, and vector quantities. PSc.1.2 Understand the relationship between forces and motion. PSc.1.2.1 Explain how gravitational force affects the weight of an object and the velocity of an object in freefall. PSc.1.2.2 Classify frictional forces into one of four types: static, sliding, rolling, and fluid. PSc.1.2.3 Explain forces using Newton's three laws of motion.
Energy and Work	Approximately 5 days	Energy Forms and Changes Energy Skate Park	PSc.3.1 Understand types of energy, conservation of energy and energy transfer. PSc.3.1.1 Explain thermal energy and its transfer. PSc.3.1.2 Explain the law of conservation of energy in a mechanical system in terms of kinetic energy, potential energy and heat. PSc.3.1.3 Explain work in terms of the relationship among the applied force to an object, the resulting displacement of the object, and the energy transferred to an object. PSc.3.1.4 Explain the relationship among work, power and simple machines both qualitatively and quantitatively.
Thermal Energy and Heat	Approximately 5 days		PSc.3.1 Understand types of energy, conservation of energy and energy transfer. PSc.3.1.1 Explain thermal energy and its transfer. PSc.3.1.2 Explain the law of conservation of energy in a mechanical system in terms of kinetic energy, potential energy and heat.



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Mechanical / Electromagnetic Waves	Approximately 5 days	Wave on a String Radio Waves and Electromagnetic Fields	PSc.3.2 Understand the nature of waves. PSc.3.2.1 Explain the relationships among wave frequency, wave period, wave velocity, amplitude, and wavelength through calculation and investigation. PSc.3.2.2 Compare waves (mechanical, electromagnetic, and surface) using their characteristics. PSc.3.2.3 Classify waves as transverse or compressional (longitudinal). PSc.3.2.4 Illustrate the wave interactions of reflection, refraction, diffraction, and interference.
Electricity and Magnetism	Approximately 5 days	Static Electricity Circuit Construction Magnets and Electromagnets	PSc.3.3 Understand electricity and magnetism and their relationship. PSc.3.3.1 Summarize static and current electricity. PSc.3.3.2 Explain simple series and parallel DC circuits in terms of Ohm's law. PSc.3.3.3 Explain how current is affected by changes in composition, length, temperature, and diameter of wire. PSc.3.3.4 Explain magnetism in terms of domains, interactions of poles, and magnetic fields. PSc.3.3.5 Explain the practical application of magnetism.