



## North Carolina Essential Standards Draft 3.0 Physical Science

### Forces and Motion

	Essential Standard	Clarifying Objectives	
PSc.1.1	<b>Understand motion in terms of speed, velocity, acceleration and momentum.</b>	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.
Psc.1.2	<b>Understand the relationship between forces and motion.</b>	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 Laws of Motion.

### Matter: Properties and Change

	Essential Standard	Clarifying Objectives	
PSc.2.1	<b>Understand types, properties, and structure of matter.</b>	PSc.2.1.1	Compare 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.
		PSc.2.1.4	Interpret data presented in Bohr model diagrams and dot diagrams for atoms and ions of elements 1 through 18.
PSc.2.2	<b>Understand chemical bonding and chemical interactions.</b>	PSc.2.2.1	Infer valence electrons, oxidation number, and reactivity of an element based on its location in the Periodic Table.
		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.
		PSc.2.2.4	Exemplify the Law of Conservation of mass by balancing chemical equations.

	Essential Standard	Clarifying Objectives	
		PSc.2.2.5	Classify types of reactions such as synthesis, decomposition, single replacement or double replacement.
		PSc.2.2.6	Summarize the characteristics and interactions of acids and bases.
PSc.3.1	Understand the role of the nucleus in radiation and radioactivity.	PSc.3.1.1	Compare nuclear reactions including; alpha decay, beta decay and gamma decay; nuclear fusion and nuclear fission.
		PSc.3.1.2	Exemplify the radioactive decay of unstable nuclei using the concept of half-life.

### Energy: Conservation and Transfer

	Essential Standard	Clarifying Objectives	
PSc.3.2	Understand the types of energy, conservation of energy and energy transfer.	PSc.3.2.1	Explain thermal energy and its transfer.
		PSc.3.2.2	Explain the Law of Conservation of Energy in a mechanical system in terms of kinetic energy, potential energy and heat.
		PSc.3.2.3	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.3.2.4	Explain the relationship among work, power and simple machines both qualitatively and quantitatively.
PSc.3.3	Understand the nature of waves.	PSc.3.3.1	Explain the relationships among wave frequency, wave period, wave velocity and wavelength through calculation and investigation.
		PSc.3.3.2	Compare waves (mechanical, electromagnetic, and surface) using their characteristics.
		PSc.3.3.3	Classify waves as transverse or compressional (longitudinal).
		PSc.3.3.4	Illustrate the wave interactions of reflection, refraction, diffraction, and interference.
PSc.3.4	Understand electricity and magnetism and their relationship.	PSc.3.4.1	Summarize static and current electricity.
		PSc.3.4.2	Explain simple series and parallel DC circuits in terms of Ohm's Law.

	Essential Standard	Clarifying Objectives	
		PSc.3.4.3	Explain how current is affected by changes in composition, length, temperature, and diameter of wire.
		PSc.3.4.4	Explain magnetism in terms of domains, interactions of poles, and magnetic fields.
		PSc.3.4.5	Explain the practical applications of magnetism.

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