

FLORIDA SCIENCE STANDARDS - Grades 9-12
Contents Standards Mapping

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Physical Science	Boardworks High School Chemistry Presentation
Standard 8: Matter	
<i>SC.912.P.8.1 - Differentiate among the four states of matter.</i>	–
<i>SC.912.P.8.2 - Differentiate between physical and chemical properties and physical and chemical changes of matter.</i>	–
SC.912.P.8.3 - Explore the scientific theory of atoms (also known as atomic theory) by describing changes in the atomic model over time and why those changes were necessitated by experimental evidence.	Introducing Atoms
SC.912.P.8.4 - Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.	Atomic Structure Introducing Atoms
SC.912.P.8.5 - Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.	Electron Configuration Electron Structure and the Periodic Table Energy Sublevels Orbitals
SC.912.P.8.6 - Distinguish between bonding forces holding compounds together and other attractive forces, including hydrogen bonding and van der Waals forces.	Covalent Bonding Intermolecular Forces Ionic Bonding Metallic Bonding
SC.912.P.8.7 - Interpret formula representations of molecules and compounds in terms of composition and structure.	Compounds Types of Formulae
SC.912.P.8.8 - Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement reactions.	Neutralization Redox Reactions
SC.912.P.8.9 - Apply the mole concept and the law of conservation of mass to calculate quantities of chemicals participating in reactions.	Conservation of Mass Molar Mass What are Moles?
SC.912.P.8.10 - Describe oxidation-reduction reactions in living and non-living systems.	Redox Reactions
SC.912.P.8.11 - Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.	pH and Indicators Properties of Acids and Alkalis
<i>SC.912.P.8.12 - Describe the properties of the carbon atom that make the diversity of carbon compounds possible.</i>	–

SC.912.P.8.13 - Identify selected functional groups and relate how they contribute to properties of carbon compounds.	Alcohols Carboxylic Acids Esters Functional Groups
Standard 10: Energy	
SC.912.P.10.1 - Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.	Energy Transfers
SC.912.P.10.2 - Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.	Energy Transfers
<i>SC.912.P.10.3 - Compare and contrast work and power qualitatively and quantitatively.</i>	–
SC.912.P.10.4 - Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter.	–
SC.912.P.10.5 - Relate temperature to the average molecular kinetic energy.	Temperature and Reaction rates
<i>SC.912.P.10.6 - Create and interpret potential energy diagrams, for example: chemical reactions, orbits around a central body, motion of a pendulum.</i>	–
SC.912.P.10.7 - Distinguish between endothermic and exothermic chemical processes.	Endothermic Reactions Exothermic Reactions
<i>SC.912.P.10.8 - Explain entropy's role in determining the efficiency of processes that convert energy to work.</i>	–
SC.912.P.10.9 - Describe the quantization of energy at the atomic level.	Energy Sublevels
<i>SC.912.P.10.10 - Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).</i>	–
SC.912.P.10.11 - Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.	Nuclear fission Nuclear fusion Radioactivity
<i>SC.912.P.10.12 - Differentiate between chemical and nuclear reactions.</i>	–
<i>SC.912.P.10.13 - Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.</i>	See Boardworks High School Physics for relevant presentations.
<i>SC.912.P.10.14 - Differentiate among conductors, semiconductors, and insulators.</i>	
<i>SC.912.P.10.15 - Investigate and explain the relationships among current, voltage, resistance, and power.</i>	
<i>SC.912.P.10.16 - Explain the relationship between moving charges and magnetic fields, as well as changing magnetic fields and electric fields, and their application to modern technologies.</i>	
<i>SC.912.P.10.17 - Explore the theory of electromagnetism by explaining electromagnetic waves in terms of oscillating electric and magnetic fields.</i>	
<i>SC.912.P.10.18 - Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.</i>	

SC.912.P.10.19 - Explain that all objects emit and absorb electromagnetic radiation and distinguish between objects that are blackbody radiators and those that are not.	See Boardworks High School Physics for relevant presentations.
SC.912.P.10.20 - Describe the measurable properties of waves and explain the relationships among them and how these properties change when the wave moves from one medium to another.	
SC.912.P.10.21 - Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.	
SC.912.P.10.22 - Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.	
Standard 12: Motion	
SC.912.P.12.1 - Distinguish between scalar and vector quantities and assess which should be used to describe an event.	See Boardworks High School Physics for relevant presentations.
SC.912.P.12.2 - Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.	
SC.912.P.12.3 - Interpret and apply Newton's three laws of motion.	
SC.912.P.12.4 - Describe how the gravitational force between two objects depends on their masses and the distance between them.	
SC.912.P.12.5 - Apply the law of conservation of linear momentum to interactions, such as collisions between objects.	
SC.912.P.12.6 - Qualitatively apply the concept of angular momentum.	
SC.912.P.12.7 - Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.	
SC.912.P.12.8 - Recognize that Newton's Laws are a limiting case of Einstein's Special Theory of Relativity at speeds that are much smaller than the speed of light.	
SC.912.P.12.9 - Recognize that time, length, and energy depend on the frame of reference.	
SC.912.P.12.10 - Interpret the behavior of ideal gases in terms of kinetic molecular theory.	
SC.912.P.12.11 - Describe phase transitions in terms of kinetic molecular theory.	Changing State Particles in Action
SC.912.P.12.12 - Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.	Concentration, Pressure and Reaction Rates Surface Area, Catalysts and Reaction Rates Temperature and reaction rates
SC.912.P.12.13 - Explain the concept of dynamic equilibrium in terms of reversible processes occurring at the same rates.	Dynamic Equilibrium Le Chatelier's Principle