

FLORIDA SCIENCE STANDARDS - Grades 9-12
Contents Standards Mapping

© Boardworks 2009

PHYSICAL SCIENCE	Boardworks High School Physics Presentation
Standard 8: Matter	
SC.912.P.8.1 - Differentiate among the four states of matter.	See Boardworks High School Chemistry for relevant presentations.
SC.912.P.8.2 - Differentiate between physical and chemical properties and physical and chemical changes of matter.	
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.	
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.	
SC.912.P.8.5 - Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.	
SC.912.P.8.6 - Distinguish between bonding forces holding compounds together and other attractive forces, including hydrogen bonding and van der Waals forces.	
SC.912.P.8.7 - Interpret formula representations of molecules and compounds in terms of composition and structure.	
SC.912.P.8.8 - Characterize types of chemical reactions, for example: redox, acid-base, synthesis, and single and double replacement 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.	
SC.912.P.8.10 - Describe oxidation-reduction reactions in living and non-living systems.	
SC.912.P.8.11 - Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.	
SC.912.P.8.12 - Describe the properties of the carbon atom that make the diversity of carbon compounds possible.	
SC.912.P.8.13 - Identify selected functional groups and relate how they contribute to properties of carbon compounds.	
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.	Conservation of Energy Energy Transfers

SC.912.P.10.3 - Compare and contrast work and power qualitatively and quantitatively.	Power Work
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.	Conduction and Convection Radiation
<i>SC.912.P.10.5 - Relate temperature to the average molecular kinetic energy.</i>	–
<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>	–
<i>SC.912.P.10.7 - Distinguish between endothermic and exothermic chemical processes.</i>	–
<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.	–
<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>	–
SC.912.P.10.13 - Relate the configuration of static charges to the electric field, electric force, electric potential, and electric potential energy.	Static Electricity
<i>SC.912.P.10.14 - Differentiate among conductors, semiconductors, and insulators.</i>	Conductors and Insulators
SC.912.P.10.15 - Investigate and explain the relationships among current, voltage, resistance, and power.	Current, Voltage and Resistance
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.	Magnetism, Current and Force Motors
SC.912.P.10.17 - Explore the theory of electromagnetism by explaining electromagnetic waves in terms of oscillating electric and magnetic fields.	Magnetism, Current and Force
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.	Electromagnetic Waves
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.	Radiation
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.	Longitudinal Waves Transverse Waves Waves
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.	Doppler Effect
SC.912.P.10.22 - Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.	Lenses

Standard 12: Motion

Standard 12: Motion	
SC.912.P.12.1 - Distinguish between scalar and vector quantities and assess which should be used to describe an event.	Momentum Vectors and Scalars
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.	Acceleration Displacement, Velocity and Acceleration Speed and Velocity
SC.912.P.12.3 - Interpret and apply Newton's three laws of motion.	Newton's First Law Newton's Second Law Newton's Third Law
SC.912.P.12.4 - Describe how the gravitational force between two objects depends on their masses and the distance between them.	Gravitational and Potential Energy
SC.912.P.12.5 - <i>Apply the law of conservation of linear momentum to interactions, such as collisions between objects.</i>	–
SC.912.P.12.6 - <i>Qualitatively apply the concept of angular momentum.</i>	–
SC.912.P.12.7 - <i>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.</i>	–
SC.912.P.12.8 - <i>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.</i>	–
SC.912.P.12.9 - <i>Recognize that time, length, and energy depend on the frame of reference.</i>	–
SC.912.P.12.10 - <i>Interpret the behavior of ideal gases in terms of kinetic molecular theory.</i>	–
SC.912.P.12.11 - Describe phase transitions in terms of kinetic molecular theory.	Changing State Particles in Action
SC.912.P.12.12 - <i>Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.</i>	–
SC.912.P.12.13 - <i>Explain the concept of dynamic equilibrium in terms of reversible processes occurring at the same rates.</i>	–