

**South Carolina High School Physical Science  
Learning Standards Mapping**

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PHYSICAL SCIENCE	Boardworks High School Physics Presentations
<b>Standard PS-5: The student will demonstrate an understanding of the nature of forces and motion.</b>	
PS-5.1 Explain the relationship among distance, time, direction, and the velocity of an object.	Displacement, Velocity and Acceleration Speed and Velocity
PS-5.2 Use the formula $v = d/t$ to solve problems related to average speed or velocity.	Speed and Velocity
PS-5.3 Explain how changes in velocity and time affect the acceleration of an object.	Acceleration Displacement, Velocity and Acceleration Speed and Velocity
PS-5.4 Use the formula $a = (v_f - v_i)/t$ to determine the acceleration of an object.	Acceleration
PS-5.5 Explain how acceleration due to gravity affects the velocity of an object as it falls.	Acceleration Gravity Newton's First Law
PS-5.6 Represent the linear motion of objects on distance-time graphs.	Displacement, Velocity and Acceleration
PS-5.7 Explain the motion of objects on the basis of Newton's three laws of motion: inertia; the relationship among force, mass, and acceleration; and action and reaction forces.	Acceleration Displacement, Velocity and Acceleration Newton's First Law Newton's Second Law Newton's Third Law Speed and Velocity
PS-5.8 Use the formula $F = ma$ to solve problems related to force.	Newton's Second Law
PS-5.9 Explain the relationship between mass and weight by using the formula $FW = mag$ .	Mass and Weight
PS-5.10 Explain how the gravitational force between two objects is affected by the mass of each object and the distance between them.	Gravity
<b>Standard PS-6: The student will demonstrate an understanding of the nature, conservation, and transformation of energy.</b>	
PS-6.1 Explain how the law of conservation of energy applies to the transformation of various forms of energy (including mechanical energy, electrical energy, chemical energy, light energy, sound energy, and thermal energy).	Conservation of Energy Energy Transfers
PS-6.2 Explain the factors that determine potential and kinetic energy and the transformation of one to the other.	Conservation of Energy Gravitational and Potential Energy Kinetic Energy

PS-6.3 Explain work in terms of the relationship among the force applied to an object, the displacement of the object, and the energy transferred to the object.	Work
PS-6.4 Use the formula $W = Fd$ to solve problems related to work done on an object.	Work
PS-6.5 Explain how objects can acquire a static electric charge through friction, induction, and conduction.	Static Electricity
PS-6.6 Explain the relationships among voltage, resistance, and current in Ohm's law.	Calculating Resistance Current, Voltage and Resistance
PS-6.7 Use the formula $V = IR$ to solve problems related to electric circuits.	Calculating Resistance
PS-6.8 Represent an electric circuit by drawing a circuit diagram that includes the symbols for a resistor, switch, and voltage source.	Circuit Diagrams
PS-6.9 Compare the functioning of simple series and parallel electrical circuits.	Series and Parallel Circuits
PS-6.10 Compare alternating current (AC) and direct current (DC) in terms of the production of electricity and the direction of current flow.	Types of Current
PS-6.11 Explain the relationship of magnetism to the movement of electric charges in electromagnets, simple motors, and generators.	Magnetism, Current and Force
<b>Standard PS-7: The student will demonstrate an understanding of the nature and properties of mechanical and electromagnetic waves.</b>	
PS-7.1 Illustrate ways that the energy of waves is transferred by interaction with matter (including transverse and longitudinal/compressional waves).	Longitudinal Waves Transverse Waves Sound Waves
PS-7.2 Compare the nature and properties of transverse and longitudinal/compressional mechanical waves.	Longitudinal Waves Transverse Waves Waves
PS-7.3 Summarize characteristics of waves (including displacement, frequency, period, amplitude, wavelength, and velocity as well as the relationships among these characteristics).	Longitudinal Transverse Waves Waves
<i>PS-7.4 Use the formulas <math>v = f \lambda</math> and <math>v = d/t</math> to solve problems related to the velocity of waves.</i>	–
PS-7.5 Summarize the characteristics of the electromagnetic spectrum (including range of wavelengths, frequency, energy, and propagation without a medium).	Electromagnetic Waves

PS-7.6 Summarize reflection and interference of both sound and light waves and the refraction and diffraction of light waves.	Diffraction Interference Reflection Refraction Sound Superposition and Interference
PS-7.7 Explain the Doppler effect conceptually in terms of the frequency of the waves and the pitch of the sound.	Doppler Effect