

**Alabama High School Science  
Curriculum Standards, 2005**

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<b>Physics Core</b>	<b>Boardworks High School Physics Presentation</b>
1 Explain linear, uniform circular, and projectile motions using one- and two-dimensional vectors. - Explaining the significance of slope and area under a curve when graphing distance-time or velocity-time data. Example: slope and area of a velocity-time curve giving acceleration and distance traveled	Circular Motion Projectiles Displacement, Velocity and Acceleration
- Describing forces that act on an object Example: drawing a free-body diagram showing all forces acting on an object and resultant effects of friction, gravity, and normal force on an object sliding down an inclined plane	Friction Gravity Newton's First Law Newton's Second Law Newton's Third Law Free-body Diagrams
2 Define the law of conservation of momentum. - Calculating the momentum of a single object	Conservation of Momentum Momentum
- Calculating momenta of two objects before and after collision in one-dimensional motion	Conservation of Momentum
3 Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws.	Newton's Third Law Gravity
4 Describe quantitative relationships for velocity, acceleration, force, work, power, potential energy, and kinetic energy.	Acceleration Work Power Gravitational and Potential Energy Kinetic Energy Newton's Second Law Conservation of energy
5 Explain the concept of entropy as it relates to heating and cooling, using the laws of thermodynamics. - Using qualitative and quantitative methods to show the relationship between changes in heat energy and changes in temperature	- Calorimetry

6 Describe wave behavior in terms of reflection, refraction, diffraction, constructive and destructive wave interference, and the Doppler effect.	Reflection Refraction Diffraction Interference Superposition and Interference Doppler Effect
- Explaining reasons for differences in speed, frequency, and wavelength of a propagating wave in varying materials	Refractive Index
- Describing uses of different components of the electromagnetic spectrum, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X rays, and gamma radiation	Waves Electromagnetic Waves X-rays Gamma Rays
- Demonstrating particle and wave duality	Wave properties of particles
- Describing the change of wave speed in different media	Refractive Index
7 Describe properties of reflection, refraction, and diffraction. Examples: tracing the path of a reflected light ray, predicting the formation of reflected images through tracing of rays	Reflection Refraction Diffraction
- Demonstrating the path of light through mirrors, lenses, and prisms Example: tracing the path of a refracted light ray through prisms using Snell's law	Reflection Refraction Diffraction Lenses Refractive Index
- Describing the effect of filters and polarization on the transmission of light	Polarization
8 Summarize similarities in the calculation of electrical, magnetic, and gravitational forces between objects.	-
- Determining the force on charged particles using Coulomb's law	-
9 Describe quantitative relationships among charge, current, electrical potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination direct current (DC) circuits.	Calculating Resistance Circuit Diagrams Current and Potential Difference Current, Voltage and Resistance Calculating Resistance Electrical Power Factors Affecting Resistance 1 Factors Affecting Resistance 2 Series and Parallel Circuits Types of Current