

Honors Physics Pacing Guide 2022-2023

Unit	Days	Major Topics	Standards	Learning Targets
Kinematics	10	1-D Kinematics Graphing Motion Projectile Motion	SP1 a SP1 b SP1 c SP1 d	LT1: I can calculate position, velocity, and acceleration for objects moving in one dimension. LT2: I can analyze and interpret position, velocity, and acceleration vs time graphs for a moving object. LT3: I can calculate position, velocity, and acceleration for objects moving in two dimensions
Forces	7	Newton's Laws Statics Dynamics	SP2 a SP2 b SP2 c	LT1: I can describe how each of Newton's Laws applies to an object experiencing forces LT 2: I can draw free body diagrams and solve forces for objects in equilibrium. LT3: I can draw free body diagrams and solve forces for dynamic systems.
Circular Motion and Gravity	8	Centripetal Forces Universal Gravitation	SP2 d SP2 e	LT1: I can calculate the relationships between velocity, mass, and radius for objects moving in a circular fashion. LT2: I can identify which forces on a free body diagram act centripetally.

				LT3: I can describe and calculate planetary motion in circular orbits. LT4: I can describe how Kepler's Laws govern planetary motion in elliptical orbits
Energy	10	Work Power Conservation of Energy Simple Harmonic Motion	SP3 a SP3 b SP2 c	LT1: I can calculate the relationship between work, energy, and net force LT2: I can describe and calculate the relationship between power and energy LT3: I can describe the difference between conservative and nonconservative forces LT4: I can calculate the potential and kinetic energies, height, and velocities of object in closed systems. LT5: I can calculate the energy, velocity, periods, and frequencies of objects in simple harmonic motion.
Momentum	10	Momentum Impulse Collisions	SP3 a SP3d	LT 1: I can describe and calculate the relationship between momentum, impulse, and force LT 2: I can describe and perform calculations involving one dimensional momentum LT3: I can experimentally compare and contrast inelastic and elastic collisions.
Waves – Inteference and Sound	10	Wave Properties	SP4 a SP4 b	LT1 : I can develop and use mathematical models to explain mechanical as a

		Constructive and Destructive Interference Standing Waves	SP 4 c SP4 g	propagating disturbance that transfers energy. LT 2: I can describe and calculate the patterns that form in standing waves LT 3: I can describe Doppler Effect, standing waves, wavelength, the relationship between amplitude and the energy of the wave, and the relationship between frequency and pitch.
Waves- Light and Optics	7	Reflection, Refraction, Diffraction Geometric Optics	SP4 a SP4 e SP4 f SP4 g	LT 1: Develop and use mathematical models to explain electromagnetic waves as a propagating disturbance that transfers energy. LT 2: I can describe and calculate the patterns that form by light diffracting through a double slit LT3: I can draw and calculate the images that form by refraction in spherical mirrors LT4: I can draw and calculate the images that form for the refraction of light in thin lenses.
Electricity	10	Electrostatics DC Circuits	SP5 a SP5 b SP5 c SP5 d	LT 1: I can explain and draw the relationship between electric fields and electric forces LT2: I can explain and calculate the relationship between energy, potential, and charge

				LT 3: I can build and calculate the voltage, resistance, and current in series and parallel circuits.
Electromagnetism	10	Magnetic Fields Electromagnetic Forces Electromagnetic Induction	SP5 e	LT 1: I can explain how the interaction of electric and magnetic forces is the basis for electric motors, generators, and the production of electromagnetic waves LT 2: I can explain how a changing electric field creates a magnetic field and a changing magnetic field creates an electric field. LT 3: I can explain how an electromagnet functions
Nuclear and Modern Physics	8	Nuclear Decay and Half Lives Quantum Mechanics Photoelectric Effect Special Relativity	SP6 a SP6 b SP6 c	LT 1: I can explain the processes of nuclear fusion and fission LT2: I can calculate the half life and amount of material decay over a length of time