Cornwall-Lebanon School District Curriculum Overview

AP Physics 1 – 10th, 11th, & 12th Grade

length of time in weeks	Concepts & Competencies	Common Assessments	Academic Standards (PA Core if applicable)
Unit 1 — 2	**Lab Skills** Students will apply the scientific method to determine solutions to problems or relationships between measured quantities. Students will properly analyze data from an experiment Students will communicate the methods and results from scientific investigations.	➢ Open Inquiry Lab ➢ Unit 1 Test	3.2.12 B6
Unit 2 — 3	**1-Dimensional Kinematics** Students will analyze the motion of an object using graphs. Students will distinguish between vector and scalar quantities. Students will solve problems involving position, velocity, and acceleration.	➢ Speed Buggy Lab ➢ Speed Buggy Challenge ➢ Car/Ramp Open-Inquiry ➢ Gravity Mini-La ➢ Unit 2 Quiz 1 ➢ Unit 2 Quiz 2 ➢ Unit 2 Test	3.2.12 B1 3.2.12 B6 3.2.12 B7
Unit 3 — 3	**2-Dimensional Kinematics** Students will add and resolve vectors Students will solve projectile motion problems. Students will recognize that motion in the x and motion in the y are independent	➢ Vector Lab ➢ Projectile Motion Lab ➢ Unit 3 Quiz 1 ➢ Unit 3 Quiz 2 ➢ Unit 3 Test	3.2.12 B1 3.2.12 B6 3.2.12 B7
Unit 4 — 3	**Forces and Newton's Laws** Students will use Newton's 1st Law to analyze balanced force situations. Students will use Newton's 2nd Law to analyze unbalanced force situations.	➢ F = mg mini lab ➢ F_{net} = ma Lab ➢ Vector Table Lab ➢ Friction Lab ➢ Unit 4 Quiz	3.2.12 B1 3.2.12 B6 3.2.12 B7

	Students will use Newton's 3rd Law to analyze action/reaction force pairs. Students will properly identify and label all forces acting on a system.	➢ Unit 4 Test	
Unit 5 2	<u>Circular Motion and Universal Gravitation</u> Students will identify and use the centripetal force. Students will solve problems using Universal Gravitation. Students will analyze planetary motion using Kepler's three laws.	➢ Flying Cow Lab ➢ Virtual Gravity Lab ➢ Virtual Kepler's Laws Lab ➢ Unit 5 Quiz ➢ Unit 5 Test	3.2.12 B1 3.2.12 B2 3.2.12 B6 3.2.12 B7
Unit 6 3	<u>Energy</u> Students will identify and calculate the energies present in a given system. Students will apply the law of Conservation of Energy to solve problems. Students will recognize that Work is the change of energy in a system. Students will calculate the amount of Work done on a system. Students will recognize that Power is the rate of doing Work.	➢ Conservation of Energy Lab ➢ Pirate Challenge Lab ➢ Horse Power Lab ➢ Unit 6 Quiz ➢ Unit 6 Test	3.2.12 B2 3.2.12 B6 3.2.12 B7
Unit 7 2	<u>Momentum</u> Students will calculate the momentum of an object. Students will use the Law of Conservation of Momentum to solve problems. Students will recognize that the change in momentum is due to an impulse. Students will distinguish between Elastic and Inelastic collisions.	➢ Ballistic Pendulum Lab ➢ Unit 7 Quiz ➢ Unit 7 Test	3.2.12 B2 3.2.12 B6 3.2.12 B7
Unit 8 4	<u>Rotational Motion</u> Students will solve problems involving angular position, velocity, and acceleration. Students will calculate the Torque acting on an object. Students will recognize and apply the conditions for Static Equilibrium. Students will calculate the Moment of Inertia for various shapes.	➢ Virtual Rotational Kinematics Lab ➢ Virtual Torque Lab ➢ Static Equilibrium Lab ➢ Unit 8 Quiz 1 ➢ Unit 8 Quiz 2 ➢ Unit 8 Test	3.2.12 B1 3.2.12 B2 3.2.12 B6 3.2.12 B7

	Students will calculate the Angular Momentum of an object and apply the conservation of angular momentum		
Unit 9 	<u>Simple Harmonic Motion and Waves</u> Students will identify the properties of waves. Students will use the properties of Simple Harmonic Motion to solve problems involving springs and pendulums. Students will solve problems involving mechanical waves using the relationship between speed, frequency and wavelength. Students will recognize the properties of sound and apply those properties to various problems.	➢ Open Inquiry Spring Lab ➢ Open Inquiry Pendulum Lab ➢ Speed of Sound Lab ➢ Unit 9 Quiz 1 ➢ Unit 9 Quiz 2 ➢ Unit 9 Quiz 3 ➢ Unit 9 Test	3.4.12 A6 3.4.12 A8 3.4.12 B2
Unit 10 	<u>Electricity</u> Students will recognize and calculate the amount of interaction between positive and negative electric charges. Students will differentiate between and calculate the Electrical Potential Energy, Electric Potential, and Potential Difference. Students will recognize and apply the properties of Voltage, Current, and Resistance. Students will solve problems using Ohm's Law and Watt's Law. Students will use Kirchhoff's Laws to determine the current in complex circuits	➢ Balloon Lab ➢ Virtual Electric Potential & Electric Field Lab ➢ Ohm's Law Lab ➢ Intro to Series & Parallel Circuit Lab ➢ Unit 10 Quiz 1 ➢ Unit 10 Quiz 2 ➢ Unit 10 Quiz 3 ➢ Unit 10 Quiz 4 ➢ Unit 10 Test	3.2.12 B1 3.2.12 B4 3.2.12 B6 3.2.12 B7