Lehighton Area School District
Curriculum Framework

Course Title:	Honors Physics
Content Area:	Science
Grade Level(s):	11-12
Course Overview:	This laboratory-oriented course provides coverage on concepts in physics, the science of matter and energy. Stress is placed on problem solving, using algebra, trigonometry, and many aspects of geometry, in order to help the college-bound student develop good thought processes. College level problems and materials are used whenever student progress in concept mastery permits.
PA Steels Standards:	PA STEELS Standards
Key Course Text and Materials:	Giancoli, D. (2009). Physics for scientists & engineers with modern physics (4th ed.). Upper Saddle River, N.J.: Pearson Prentice Hall.
Key Assessments/Projects:	Long Term Problem Sets, Lab reports, Written Tests

Big Idea/Unit: Kinematics / Objects that move in translational motion are described in terms of position, velocity, and acceleration **Pacing:** 6 weeks				
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.2.12I	Differentiate scalar and vector quantities Calculate kinematic quantities Derive and manipulate kinematic equations Apply kinematics to freely falling objects.	Kinematics Reference Frame Displacement Average Speed Average Velocity Instantaneous Velocity Average Acceleration Instantaneous Acceleration Acceleration due to gravity	Dynamics tracks and carts. Motion sensors Ticker tape timers Photogates Laptops with DataStudio Stopwatches Measuring tapes	Long Term Problem Set Kinematic Lab report Written Test – Multiple choice and open ended.

Big Idea/Unit: Vectors / Vector quantities are fully described using both magnitude and direction. **Pacing:** 6 weeks				
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.2.12I 3.2.12J 3.2.12M	Graphical addition of vectors. Vector resolution. Analytical addition of vectors. Projectile motion.	Vector Scalar Vector components Resultant vector Projectile motion Trajectory	Rulers Protractors Measuring tapes Photogates Projectile Launchers Laptops with DataStudio.	Long Term Problem Set Projectile Motion Lab report Written Test – Multiple choice and open ended.

Big Idea/Unit: Dynamics / Forces are essential to understanding motion. **Pacing:** 6 weeks

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.12I 3.2.12Q	Newton's Three Laws of Motion. Free Body Diagrams Vertical and Horizontal forces. Friction Inclined Planes	Inertia Force Mass Normal Force Force due to gravity Net Force Static Friction Kinetic Friction Coefficient of friction	Newton's Laws demonstrations. Inclined planes. Friction blocks Measuring tapes Standard masses Mass balance Stopwatches Force sensors Smart pulleys Laptops with Sparkview	Long Term Problem Set Atwood's Device Lab report Written Test – Multiple choice and open ended.

Big Idea/Unit: Circular Motion and Gravitation / Objects can move in circles. All objects in the universe attract all other objects in the universe.
Pacing: 6 weeks

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.12I 3.2.12L 3.2.12O	Uniform Circular Motion. Horizontal and Vertical Circles. Law of Gravitation Orbits	Tangential Velocity Radius Centripetal acceleration and force Centrifugal acceleration and force Universal Gravitation Universal Gravitational Constant	Compasses Measuring tapes Force sensors Photogates Standard masses Mass balance Pendulum rod Laptops with Sparkview	Long Term Problem Set Centripetal Force Lab report Written Test – Multiple choice and open ended.

Big Idea/Unit: Work and Energy / Energy and its conservation are essential to describing and analyzing motion.
Pacing: 6 weeks

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.2.12O 3.2.12T 3.2.12W	Work Energy Work-energy principle Energy conservation Non-conservative force Power	Work Energy Kinetic Energy Gravitational Potential Energy Elastic Energy Work Energy Principle Law of Conservation of energy Friction Power	Energy conservation demonstration Dynamics track Frictionless cart. Mass balance Spring launch accessory Photogates Laptops with Sparkview	Long Term Problem Set Conservation of Energy Lab report Written Test – Multiple choice and open ended.