Planned Course: Honors Physics Unit # 2: Dynamics Estimated Time: 6 weeks	Course Number: 403H Grade Level: 11/12 Level/Track: Honors/AP	Department: Science Board Approval Date: August 27, 2018	
Big Ideas / PA Academic Standards	➢ **Core Concepts (in question format)** ● **Skills/Knowledge**	**Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)**	**Assessments (include types and topics)**
Big Ideas **Big Idea 1**: Objects and systems have properties such as mass and charge. Systems may have internal structure. **Big Idea 2:** Fields existing in space can be used to explain interactions. **Big Idea 3:** The interactions of an object with other objects can be described by forces. **Big Idea 4:** Interactions between systems can result in changes in those systems. **PA Academic Standards** **3.2.10.B1:** Analyze the relationships among the net forces acting on a body, the mass of the body, and the resulting acceleration using	➢ What causes an object to change its state of motion? ● Explain how force affects the motion of an object. ● Distinguish between field and contact forces. ● Interpret and construct free-body diagrams. ➢ How is net force calculated and what is equilibrium? ● Explain the relationship between the motion of an object and the net external force acting on it. ● Determine the net external force on an object. ● Calculate the force required to bring an object into equilibrium. ➢ What are Newton's 2nd and 3rd laws? ● Describe the acceleration of an object in terms of its	Atwood's Machine Lab ● Students will explore the relationship between the mass of a system and the acceleration of a system. Static Equilibrium Challenge ● Students will determine the mass of a hanging object in a setup with three strings at various angles. Coefficient of Friction Lab ● Students will determine the maximum coefficient of friction between a block and a wooden plank. Problem Solving Examples and Guided Practice Class discussion and guided note taking	Hands on laboratory assessments (Atwood's Machine Lab, Static Equilibrium Challenge, Coefficient of Friction Lab) Lab Simulations (Moving Man Gizmo, Match the Graph Simulation). Quizzes on major concepts. Homework to reinforce major concepts. Unit Test.

Newton's Second Law of Motion. Use Newton's Third Law to explain forces as interactions between bodies.	mass and the net force acting on it. - Predict the direction and magnitude of the acceleration caused by a known net external force. - Identify action-reaction pairs. - Explain why action-reaction pairs do not result in equilibrium. ➢ How do different forces affect net force and motion? - Explain the difference between weight and mass. - Find the direction and magnitude of the normal force. - Describe air resistance as a form of friction. - Use coefficients of friction to calculate frictional force.		