Planned Course: Honors Physics Unit # 8: Electrostatics and Circuits Estimated Time: 4 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 3: The interactions of an object with other objects can be described by forces.
 	
Big Idea 5: Changes that occur as a result of interactions are constrained by conservation laws.
 	
PA Academic Standards
 	
3.2.10.B4:
 	
Describe quantitatively the relationships between voltage, current, and resistance to electrical energy and power.
 	
Describe the relationship between electricity and magnetism as two aspects of a single
	➢ What is electric current?
	  ● Describe the basic properties of electric current.
	  ● Solve problems relating current, charge, and time.
	  ● Distinguish between the drift speed of a charge carrier and the average speed of a charge carrier between collisions.
	  ● Differentiate between direct current and alternating current.
	➢ How does resistance affect voltage and current?
	  ● Calculate resistance, current, and potential difference using the definition of resistance.
	  ● Distinguish between ohmic and non-ohmic materials.
	  ● Know what factors affect resistance.
		Series and Parallel Lab
		● Using a number of resistors, explore current and voltage in resistors hooked up to a power supply when resistors are wired in series with one another rand when they are wired in parallel with one another.
		
		Coulomb's Law Lab
		● What is the charge stored on a pair of charged balloons that are repelling each other?
		
		Advanced Circuits Virtual Lab (Gizmo)
		● Students will build compound circuits with series and parallel elements. Calculate voltages, resistance, and current across each component using Ohm's law and the equivalent resistance equation. Check your answers using a voltmeter, ammeter, and ohmmeter.
			Hands on laboratory assessments (Intro to Circular Motion Lab, Circular Motion Station Lab)
			
			Lab Simulations (Jupiter's Moons Virtual Lab, Portions of Circular Motion Station Lab).
			
			Quizzes on major concepts.
			
			Homework to reinforce major concepts.
			
			Unit Test.

electromagnetic force.
 	
3.2.P.B4
 	
Explain how stationary and moving particles result in electricity and magnetism.
 	
Develop qualitative and quantitative understanding of current, voltage, resistance, and the connections among them.
 	
Explain how electrical induction is applied in technology.
	● Describe what is unique about superconductors.
	➢ What is electric power?
	   ● Relate electric power to the rate at which electrical energy is converted to other forms of energy.
	   ● Calculate electric power.
	   ● Calculate the cost of running electrical appliances.
		Problem Solving Examples and Guided Practice
		
		Class discussion and guided note taking	