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| Planned Course: Honors Physics Unit # 6: Rotation 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 | <ul style="list-style-type: none"> ● Core Concepts (in question format) <ul style="list-style-type: none"> ● Skills/Knowledge | Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities) | Assessments (include types and topics) |
| <p>Big Ideas</p> <p>Big Idea 3: The interactions of an object with other objects can be described by forces.</p> <p>Big Idea 4: Interactions between systems can result in changes in those systems.</p> <p>Big Idea 5: Changes that occur as a result of interactions are constrained by conservation laws.</p> <p>PA Academic Standards</p> <p>3.2.12.B1:</p> <p>Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.</p> <p>3.2.P.B1:</p> <p>Differentiate among translational motion, simple harmonic motion, and rotational motion in terms of position, velocity, and acceleration</p> | <ul style="list-style-type: none"> ➤ What is the difference between force and torque, and how is torque calculated? <ul style="list-style-type: none"> ● Recognize the difference between a point mass and an extended object. ● Distinguish between torque and force. ● Calculate the magnitude of a torque on an object. ● Identify the lever arm associated with a torque on an object ➤ What is center of mass and how is it determined? <ul style="list-style-type: none"> ● Identify the center of mass of an object. ● Distinguish between mass and moment of inertia. ➤ What are the two conditions of equilibrium? <ul style="list-style-type: none"> ● Define the second condition of equilibrium. ● Solve problems | <p>Torque Lab</p> <ul style="list-style-type: none"> ● Students will use a meter stick on a fulcrum with varying masses at varying location to study rotational equilibrium. <p>Conservation of Angular Momentum Lab</p> <ul style="list-style-type: none"> ● Students will explore the relationship between the moment of inertia of a system and the angular momentum of a system. <p>Figure Skater Demonstration</p> <ul style="list-style-type: none"> ● Students explore moment of inertia and angular momentum. <p>Rolling Disks Inquiry Lab</p> <ul style="list-style-type: none"> ● Students will investigate moment of inertia by varying the position of weights within discs and rolling them down a ramp. <p>Problem Solving Examples and Guided Practice</p> | <p>Hands on laboratory assessments (Intro to Circular Motion Lab, Circular Motion Station Lab)</p> <p>Lab Simulations (Jupiter's Moons Virtual Lab, Portions of Circular Motion Station Lab).</p> <p>Quizzes on major concepts.</p> <p>Homework to reinforce major concepts.</p> <p>Unit Test.</p> |

involving the first and second conditions of equilibrium.

- How does Newton's 2nd Law apply to rotating objects?
- Describe Newton's 2nd law for rotation.
 - Calculate the angular momentum of various rotating objects.
 - Solve problems involving rotational kinetic energy

Class discussion and guided note taking