Unit 2: Dynamics

Content Area: **Template**
Course(s):
Time Period:
Length:
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Unit 2: Dynamics

Learning Objectives

- How does our actual weight differ from how heavy we feel?
- Projectile motion is both horizontal and vertical motion. These two motions are independent of one another and are analyzed separately.
- Trajectories are parabolic.
- Uniform circular motion requires centripetal forces that act straight towards the center.
- What are the four fundamental forces and when is each observed?
- What are the laws that govern motion and how do we apply them?
- What is equilibrium?

Essential Skills

- Define the friction force and distinguish between static and kinetic friction.
- Describe how the weight and the mass of an object are related.
- Determine force that produces equilibrium when three forces act on an object.
- Explain how the shape of the trajectory of a moving object depends upon the frame of reference from which it is observed.
- Explain interaction pairs of forces and how they are related by Newton's third law
- Explain the acceleration of an object moving in a circle at constant speed.
- Explain the meaning of Newton's first law and describe an object in equilibrium.
- Explain the tension in ropes and strings in terms of Newton's third law.
- Recognize Newton's second law of motion and use it to solve motion problems.
- Recognize that the vertical and horizontal motions of a projectile are independent.

Standards

9-12.HS-PS2-1	Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
9-12.HS-PS2-4	Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.
9-12.HS-PS2-2	Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.

Instructional Tasks/Activities

- Constructed response
- Do nows and exit slips
- Graphic organizers or models
- Guided practice
- Homework
- Individual, small, and large group work
- Laboratory investigations within small groups

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Flash cards and/or drill practice
- Inquiry based activities with reflective discussion
- Journal / Student Reflection
- Kahoot
- Laboratory groups
- Lecture with note taking and guided notes
- Online models and simulators
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project

- Quiz
- Rubric
- Teacher Collected Data
- Test
- Whole and small group discussions
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning

- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

Resources

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5