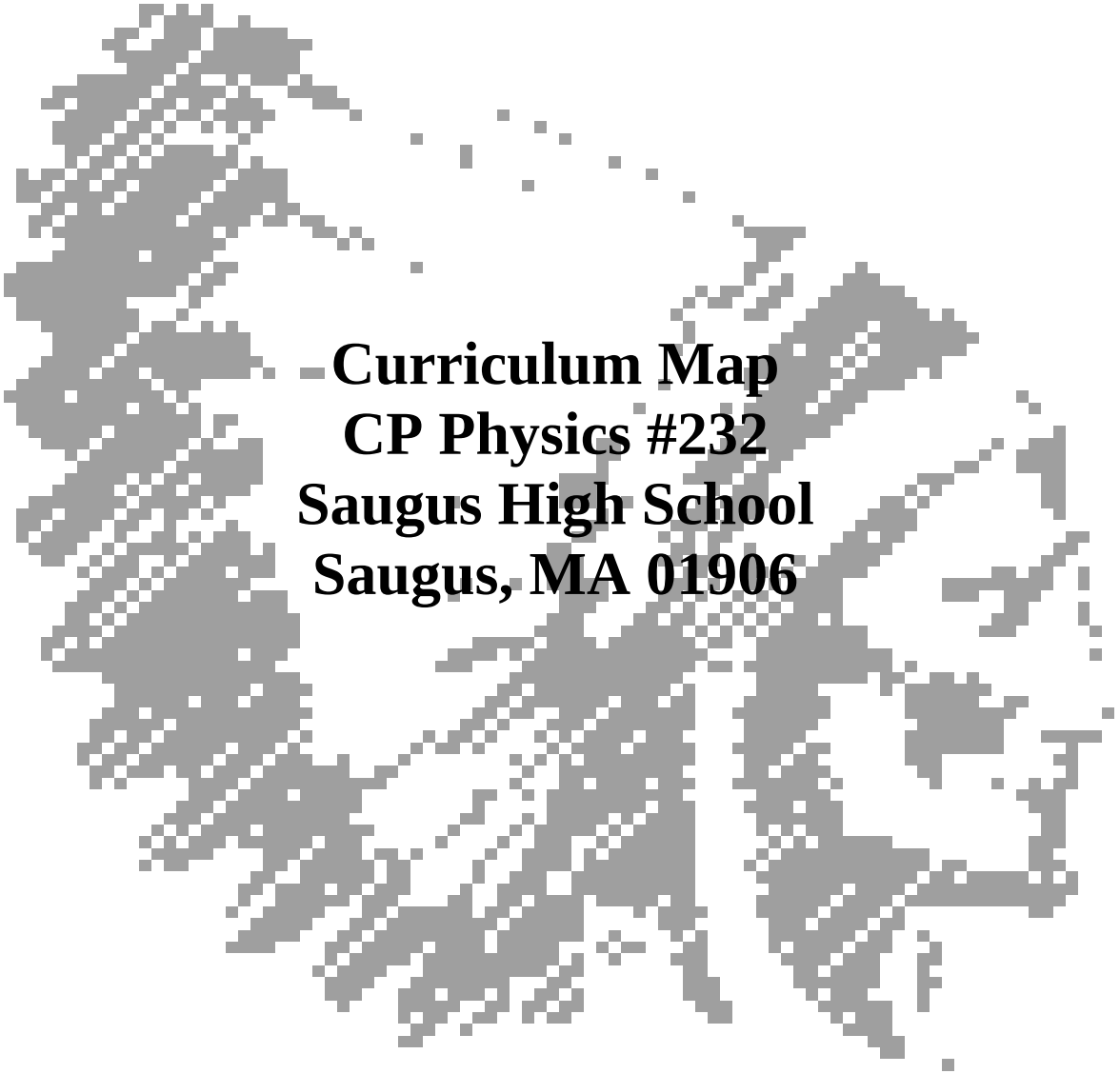

Curriculum Map
CP Physics #232
Saugus High School
Saugus, MA 01906

Week 1

Performance Standards

The students will:

Unit/Topic./Lesson

Introduction
Physics – The Basic Science

Objectives (Students Will...)

- **Explain** why physics is the basic science
- **Outline** scientific methods
- **Distinguish** among observations, facts, hypotheses, laws, and principles
- **Describe** circumstances under which a hypothesis or law must be changed or abandoned
- **Distinguish** between the everyday meaning and the scientific meaning of theory and **explain** why the refinement of theories is a strength in science
- **Distinguish** between a hypothesis that is scientific and one that is not
- **Distinguish** between science and technology

Essential Question

What is physics?

Labs/Demonstrations/Handouts

Handout: Syllabus

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 1
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 1 Review
Chapter 1 Problems

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 2

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.2 – **Distinguish** between displacement, distance, velocity, speed, and acceleration. **Solve** problems involving displacement, distance, velocity, speed, and constant acceleration.

Physics 1.3 – **Create** and **interpret** graphs of 1-dimensional motion, such as position vs. time, distance vs. time, speed vs. time, velocity vs. time, and constant acceleration vs. time

Unit/Topic./Lesson

Linear Motion
Relative motion
Speed
Velocity

Objectives (Students Will...)

Explain the idea that motion is relative
Define speed and **distinguish** between instantaneous speed and average speed
Distinguish between speed and velocity, and **describe** how to tell whether a velocity is changing
Define acceleration and give examples of its units
Describe the motion of free fall
Describe the motion of an object thrown straight up and allowed to fall until it hits the ground
Determine the speed and the distance fallen at any time after an object is dropped from rest, when air resistance is negligible

Essential Question

What is the difference between speed, velocity, and acceleration?

Labs/Demonstrations/Handouts

Lab: Whirligigs
Demos: Free fall

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 2
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 2 Review
Chapter 2 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 2 Worksheets
Lab Report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 3

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.2 – **Distinguish** between displacement, distance, velocity, speed, and acceleration. **Solve** problems involving displacement, distance, velocity, speed, and constant acceleration.

Physics 1.3 – **Create** and **interpret** graphs of 1-dimensional motion, such as position vs. time, distance vs. time, speed vs. time, velocity vs. time, and constant acceleration vs. time

Unit/Topic./Lesson

Linear Motion
Acceleration
Air resistance

Objectives (Students Will...)

Explain how graphs can be used to describe relationships among time, distance, and speed
Describe how air resistance affects the motion of falling objects
Explain why acceleration is a rate of a rate

Essential Question

What is a vector?

Labs/Demonstrations/Handouts

Lab: How fast?

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 2
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 2 Review
Chapter 2 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 2 Worksheets
Lab Report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 4

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.2 – **Distinguish** between displacement, distance, velocity, speed, and acceleration. **Solve** problems involving displacement, distance, velocity, speed, and constant acceleration.

Unit/Topic./Lesson

Projectile motion
Vectors
Scalars

Objectives (Students Will...)

Distinguish between a vector quantity and a scalar quantity, and **give** examples of each
Draw vector diagrams for velocities and **use** the parallelogram method to find the resultant of two vectors that have different directions
Given a vector, **resolve** it into horizontal and vertical components

Essential Question

At which point in its path does a projectile have minimum speed?

Labs/Demonstrations/Handouts

Lab: Merrily we roll along
Demos: Projectiles

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 3
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 3 Review
Chapter 3 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 3 Worksheets
Lab Report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 5

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.2 – **Distinguish** between displacement, distance, velocity, speed, and acceleration. **Solve** problems involving displacement, distance, velocity, speed, and constant acceleration.

Unit/Topic./Lesson

Projectile motion
Parallelogram method (components and resultants)
Satellites

Objectives (Students Will...)

For a projectile, **describe** the changes in the horizontal and vertical components of its velocity, when air resistance is negligible
Explain why a projectile moves equal distances horizontally in equal time intervals, when air resistance is negligible
Describe satellites as fast-moving projectiles

Essential Question

What is a projectile?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 3
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 3 Review
Chapter 3 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 3 Worksheets
Test: Chapter 2 & 3

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 6

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.4 – **Demonstrate** an operational understanding of Newton's three laws of motion.

Physics 1.5 – **Use** a free-body force diagram to show forces acting on a system consisting of a pair of interacting objects. For a diagram of only co-linear forces, **determine** the net force acting on a system and between the objects.

Unit/Topic./Lesson

Newton's 1st Law of Motion – Inertia
Galileo – ramps
Inertia
Net force
Equilibrium
Vector addition of forces

Objectives (Students Will...)

Describe Aristotle's concepts of natural and violent motion
Describe Copernicus' idea about Earth's motion
Describe Galileo's contribution to the science of motion
State Newton's first law of motion
Distinguish among mass, volume, and weight, and their units of measurement
Explain how something that is not connected to the ground is able to keep up with the moving Earth
Explain why a clothesline or wire that can easily support an object when strung vertically may break when strung horizontally and supporting the same object
Describe how the angle between vectors affects their resultant vector

Essential Question

What is Newton's first law of motion?

Labs/Demonstrations/Handouts

Demo: Newton's 1st law

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 4
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 4 Review
Chapter 4 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 4 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 7

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.2 – **Distinguish** between displacement, distance, velocity, speed, and acceleration. **Solve** problems involving displacement, distance, velocity, speed, and constant acceleration.

Physics 1.4 – **Demonstrate** an operational understanding of Newton's three laws of motion.

Physics 1.5 – **Use** a free-body force diagram to show forces acting on a system consisting of a pair of interacting objects. For a diagram of only co-linear forces, **determine** the net force acting on a system and between the objects.

Physics 1.6 – **Describe** a simple model for frictional force, including static and kinetic friction

Unit/Topic./Lesson

Newton's 2nd Law of Motion – Force and Acceleration
Force causes acceleration
Mass resists acceleration
Newton's 2nd Law a=F/m
Friction
Pressure
Free fall and Newton's 2nd Law
Falling and air resistance

Objectives (Students Will...)

State the relationship between acceleration and net force
State the relationship between acceleration and mass
State and **explain** Newton's second law of motion
Describe the effect of friction on stationary and on moving objects
Distinguish between force and pressure
Explain why the acceleration of an object in free fall does not depend upon the mass of the object
Describe the effect of air resistance on a falling object

Essential Question

What is Newton's third law of motion?

Labs/Demonstrations/Handouts

Labs: Friction

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 5
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 5 Review
Chapter 5 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 5 Worksheets
Lab report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 8

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 1.4 – **Demonstrate** an operational understanding of Newton's three laws of motion.

Physics 1.5 – **Use** a free-body force diagram to show forces acting on a system consisting of a pair of interacting objects. For a diagram of only co-linear forces, **determine** the net force acting on a system and between the objects.

Unit/Topic./Lesson

Newton's 3rd Law of Motions – Action and Reaction
Forces and interactions
Identifying action and reaction (ex: gun, rocket)
Action and reaction cancel?

Objectives (Students Will...)

Define force as part of an interaction
State Newton's third law of motion
Given an action force, **identify** the reaction force
Explain why the acceleration caused by an action force and by a reaction force do not have to be equal
Explain why an action force is not cancelled by the reaction force
Describe the horse-cart problem
Explain why you cannot touch without being touched

Essential Question

What is Newton's third law of motion?

Labs/Demonstrations/Handouts

Demo: Newton's 3rd Law (fan cart)

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 6
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 6 Review
Chapter 6 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 6 Worksheets
Test: Chapter 4, 5 & 6

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 9

Performance Standards

Physics 1.1 – **Distinguish** between vector quantities (such as displacement, velocity, acceleration, weight, and linear momentum) and scalar quantities (such as distance, speed, energy, mass, and work).

Physics 2.5 – **Interpret** and provide examples that linear momentum is the product of mass and velocity and can be conserved (law of conservation of momentum). **Calculate** the momentum of an object.

Unit/Topic./Lesson

Momentum
Impulse – large time vs. large force (ex: bungee jump)
Bouncing
Conservation of momentum (ex: gun)
Collisions (elastic/inelastic)

Objectives (Students Will...)

Define momentum
Define impulse and describe how it affects changes in momentum
Explain why an impulse is greater when an object bounces than when the same object comes to a sudden stop
State the law of conservation of momentum
Distinguish between an elastic collision and an inelastic collision
Give an example of how the vector nature of momentum affects the law of conservation of momentum

Essential Question

What is momentum?

Labs/Demonstrations/Handouts

Demo: Collisions

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 7
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 7 Review
Chapter 7 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 7 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 10

Performance Standards

Physics 2.1 – **Interpret** and provide examples that illustrate the law of conservation of energy.

Physics 2.2 – **Interpret** and provide examples of how energy can be converted from gravitational potential energy to kinetic energy and vice versa.

Physics 2.3 – **Describe** both conceptually and quantitatively how work can be expressed as a change in mechanical energy.

Physics 2.4 – **Describe** both conceptually and quantitatively the concept of power as work done per unit time.

Unit/Topic./Lesson

Energy
Work
Power
Mechanical energy
Potential energy
Kinetic energy
Conservation of energy
Efficiency

Objectives (Students Will...)

Define and **describe** work
Define and **describe** power
Define mechanical energy
Define potential energy
Define kinetic energy and **describe** the work-energy theorem
State the law of conservation of energy

Essential Question

What is energy?

Labs/Demonstrations/Handouts

Lab: Muscle up
Demo: Simple machines

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 8
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 8 Review
Chapter 8 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 8 Worksheets
Lab report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 11

Performance Standards

Physics 2.1 – **Interpret** and provide examples that illustrate the law of conservation of energy.

Physics 2.2 – **Interpret** and provide examples of how energy can be converted from gravitational potential energy to kinetic energy and vice versa.

Physics 2.3 – **Describe** both conceptually and quantitatively how work can be expressed as a change in mechanical energy.

Physics 2.4 – **Describe** both conceptually and quantitatively the concept of power as work done per unit time.

Unit/Topic./Lesson

Energy
Efficiency

Objectives (Students Will...)

Describe simple machines and mechanical advantage
Explain why no machine can have an efficiency of 100%
Describe the role of energy in living organisms

Essential Question

What are simple machines?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 8
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 8 Review
Chapter 8 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 8 Worksheets
Test: Chapter 7 & 8

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 12

Performance Standards

Physics 1.8 – **Describe** conceptually the forces involved in circular motion.

Unit/Topic./Lesson

Circular motion
Rotational speed
Centripetal force
Centrifugal force
Simulated gravity

Objectives (Students Will...)

Distinguish between *rotate* and *revolve*
Describe rotational speed
Give examples of centripetal force
Describe the motion of an object if the centripetal force acting on a string ceases
Explain why centrifugal force is "fictitious"
Describe how a simulated gravitational acceleration can be produced

Essential Question

What type of force causes an object to follow a circular path?

Labs/Demonstrations/Handouts

Lab: Round and Round we go

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 9
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 9 Review
Chapter 9 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 9 Worksheets
Lab report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 13

Performance Standards

Unit/Topic./Lesson

Center of gravity
Center of mass

Objectives (Students Will...)

Describe center of gravity
Describe center of mass
Describe how to find the center of gravity of an irregularly shaped object
Describe how to predict whether an object will topple
Distinguish among stable equilibrium, unstable equilibrium, and neutral equilibrium
Give examples of how people are affected by their centers of gravity

Essential Question

Where is the center of mass in a donut?

Labs/Demonstrations/Handouts

Demo: Toppling, beaker

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 10
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 10 Review
Chapter 10 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 10 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 14

Performance Standards

Physics 1.8 – **Describe** conceptually the forces involved in circular motion.

Physics 2.5 – **Interpret** and provide examples that linear momentum is the product of mass and velocity and is always conserved (law of conservation of momentum). **Calculate** the momentum of an object.

Unit/Topic./Lesson

Rotational mechanics
Torque
Balancing torques

Objectives (Students Will...)

Define and **describe** torque
Describe the condition required for one torque to balance another
Given the location of the center of gravity of an object and the position and direction of the forces on it, **tell** whether the forces will produce rotation

Essential Question

What is torque?

Labs/Demonstrations/Handouts

Lab: Torque Feeler activity/Keeping in balance
Demo: Conservation of angular momentum

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 11
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources
-

Assessment Activities

Chapter 11 Review
Chapter 11 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 11 Worksheets
Lab report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 15

Performance Standards

Physics 1.8 – **Describe** conceptually the forces involved in circular motion.

Physics 2.5 – **Interpret** and provide examples that linear momentum is the product of mass and velocity and is always conserved (law of conservation of momentum). **Calculate** the momentum of an object.

Unit/Topic./Lesson

Rotational mechanics
Rotational inertia
Angular momentum

Objectives (Students Will...)

Describe on what the rotational inertia of an object depends
Give examples of how a gymnast changes the rotational inertia of the body in order to change the spin rate
Define angular momentum and **describe** the conditions under which it (a) remains the same and (b) changes
Give an example in which rotational speed changes but angular momentum does not

Essential Question

What is rotational inertia?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 11
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 11 Review
Chapter 11 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 11 Worksheets
Test: Chapter 9, 10 & 11

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 16

Performance Standards

Physics 1.7 – **Describe** Newton's law of universal gravitation in terms of the attraction between two objects, and the distance between them.

Unit/Topic./Lesson

Universal gravitation
Falling apple/moon/earth
Newton's Law of Universal Gravitation
Inverse square law

Objectives (Students Will...)

Explain Newton's idea of why the apple falls to Earth
Explain why the moon does not fall to Earth
Explain how Earth is falling
State Newton's law of universal gravitation
Explain the significance of an inverse-square law
Explain the connection between gravitation and the idea that the universe may stop expanding and begin to contract

Essential Question

What is Newton's law of universal gravitation?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 12
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 12 Review
Chapter 12 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 12 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 17

Performance Standards

Physics 1.7 – **Describe** Newton's law of universal gravitation in terms of the attraction between two objects, and the distance between them.

Unit/Topic./Lesson

Gravitational interactions
Gravitational fields
Gravitational field inside a planet (jumping through)
Ocean tides
Black holes

Objectives (Students Will...)

Describe the gravitational field outside Earth
Describe the gravitational field inside Earth
Explain why an astronaut in Earth orbit seems weightless even though there is a gravitational force
Explain ocean tides
Give examples of tides other than those in water
Describe black holes

Essential Question

What is a gravitational field?

Labs/Demonstrations/Handouts

Demo: Weight and weightlessness

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 13
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 13 Review
Chapter 13 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 13 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 18

Performance Standards

Physics 1.7 – **Describe** Newton's law of universal gravitation in terms of the attraction between two objects, and the distance between them.

Physics 1.8 – **Describe** conceptually the forces involved in circular motion.

Physics 2.1 –**Interpret** and provide examples that illustrate the law of conservation of energy.

Physics 2.2 – **Interpret** and provide examples of how energy can be converted from gravitational potential energy to kinetic energy and vice versa.

Unit/Topic./Lesson

Satellite motion
Earth satellites
Circular orbits
Elliptical orbits
Energy conservation
Escape speed

Objectives (Students Will...)

Explain how the speed of a satellite in circular orbit around Earth is related to the distance an object falls in the first second due to gravity
Explain why the force of gravity does not cause a change in the speed of a satellite in circular orbit
Describe how the speed of a satellite changes in different portions of an elliptical orbit
Apply the law of conservation of energy to **describe** changes in the PE and KE of a satellite in different portions of an elliptical orbit
Determine the vertical speed required to ensure a projectile can "escape" Earth

Essential Question

What is a satellite?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 14
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 14 Review
Chapter 14 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 14 Worksheets
Test: Chapter 12, 13 & 14

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 19

Performance Standards

Physics 3.2 – **Explain** how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached.

Physics 3.3 – **Describe** the relationship between average molecular kinetic energy and temperature. **Recognize** that energy is absorbed when a substance changes from a solid to a liquid to a gas, and that energy is released when a substance changes from a gas to a liquid to a solid. **Explain** the relationships between evaporation, condensation, cooling, and warming.

Physics 3.4 – **Explain** the relationship among temperature change in a substance for a given amount of heat transferred, the amount (mass) of the substance, and the specific heat of the substance.

Unit/Topic./Lesson

Temperature, Heat, and Expansion
Temperature
Heat
Thermal Equilibrium
Internal Energy
Measurement of Heat
Specific Heat Capacity → water
Expansion of water

Objectives (Students Will...)

Define temperature in terms of KE and describe the common temperature scales
Define heat
Define thermal equilibrium
Distinguish between internal energy and heat
Describe how the quantity of heat that enters or leaves a substance is measured
Compare the specific heat capacities of different substances
Describe how water's high specific heat capacity affects climate
Give examples and applications of thermal expansion of solids
Describe the behavior of water as it is heated from 0°C to 15°C
Explain conduction and its effects

Essential Question

What is heat?

Labs/Demonstrations/Handouts

Labs: Specific Heat
Demo: Thermal expansion

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 21
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 21 Review
Chapter 21 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 21 Worksheets
Lab report

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 20

Performance Standards

Physics 3.1 – **Explain** how heat energy is transferred by convection, conduction, and/or radiation.

Physics 3.2 – **Explain** how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached.

Unit/Topic./Lesson

Heat Transfer
Absorption of radiant energy
Emission of radiant energy
Newton's Law of Cooling
Greenhouse effect

Objectives (Students Will...)

Distinguish between conduction and convection
Explain how heat can be transmitted through empty space
Given the color and shininess of two object, **predict** which is likely to absorb radiant energy more easily
Compare the ability of an object to emit radiant energy with its ability to absorb radiant energy
Relate the temperature difference between an object and its surroundings to the rate at which it cools
Describe global warming and Earth's greenhouse effect

Essential Question

Labs/Demonstrations/Handouts

Demo: Conduction, Convection and Radiation

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 22
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 22 Review
Chapter 22 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 22 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 21

Performance Standards

Physics 3.3 – **Describe** the relationship between average molecular kinetic energy and temperature. **Recognize** that energy is absorbed when a substance changes from a solid to a liquid to a gas, and that energy is released when a substance changes from a gas to a liquid to a solid. **Explain** the relationships between evaporation, condensation, cooling, and warming.

Unit/Topic./Lesson

Change of Phase
Evaporation
Condensation
Boiling
Freezing
Energy and Changes of phase
Heating/Cooling curves

Objectives (Students Will...)

Explain why evaporation of water is a cooling process
Explain why condensation is a warming process
Explain why a person with wet skin feels chillier in dry air than in moist air at the same temperature
Distinguish between evaporation and boiling and explain why food cooked in boiling water takes longer to cook at high altitudes
Explain why water with substances dissolved in it freezes at a lower temperature than pure water
Describe how something can boil and freeze at the same time
Describe how ice melts under pressure and refreezes when the pressure is removed
Describe how a substance can absorb or release energy with no resulting change in temperature

Essential Question

How is heat energy related to phase changes?

Labs/Demonstrations/Handouts

Lab: Freezing Good Time

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 23
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 23 Review
Chapter 23 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 23 Worksheets
Lab report
Test: Chapter 21, 22 & 23

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 22

Performance Standards

Physics 4.1 – **Describe** the measureable properties of waves (velocity, frequency, wavelength, amplitude, period) and **explain** the relationships among them. **Describe** a simple harmonic motion.
Physics 4.2 – **Distinguish** between mechanical and electromagnetic waves.

Physics 4.3 – **Distinguish** between two types of mechanical waves, transverse and longitudinal.

Physics 4.6 – **Interpret** graphs of constructive and destructive interference of waves.

Unit/Topic./Lesson

Vibrations and Waves
Vibration of a Pendulum
Wave description, Wave motion, Wave speed
Transverse waves
Longitudinal waves
Interference
The Doppler Effect
Bow waves
Shock waves

Objectives (Students Will...)

Describe the period of a pendulum
Describe the characteristics and properties of waves
Describe wave motion
Describe factors that affect the speed of a wave
Distinguish between transverse and longitudinal waves
Distinguish between constructive and destructive interference
Describe how a standing wave occurs
Describe the Doppler effect for sound and relate it to the blue and red shifts for light
Describe bow waves
Describe sonic booms

Essential Question

What is a wave?

Labs/Demonstrations/Handouts

Lab: Pendulum
Demo: Standing waves

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 25
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 25 Review
Chapter 25 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 25 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 23

Performance Standards

Physics 4.1 – **Describe** the measurable properties of waves (velocity, frequency, wavelength, amplitude, and period) and explain the relationship among them. **Recognize** examples of simple harmonic motion.

Physics 4.2 – **Distinguish** between mechanical and electromagnetic waves.

Physics 4.3 – **Distinguish** between two types of mechanical waves, transverse and longitudinal.

Physics 4.5 –**Recognize** that mechanical waves generally move faster through a solid than through a liquid and faster through a liquid than through a gas.

Unit/Topic./Lesson

Sound
The Origin of Sound
Sound in Air
Media that transmit sound
Speed of sound
Loudness
Forced vibration
Natural frequency
Interference
Beats

Objectives (Students Will...)

Relate the pitch of a sound to its frequency
Describe the movement of sound through air
Compare the transmission of sound through air with that through solids, liquids, and a vacuum
Describe factors that affect the speed of sound
Describe loudness and sound intensity
Give examples of forced vibration
Describe natural frequency
Describe resonance
Describe how sound waves interfere with on another
Describe beats

Essential Question

What is a sound wave?

Labs/Demonstrations/Handouts

Demo: Resonance

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 26
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources
-

Assessment Activities

Chapter 26 Review
Chapter 26 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 26 Worksheets
Test: Chapter 25 & 26

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 24

Performance Standards

Physics 4.1 – **Describe** the measurable properties of waves (velocity, frequency, wavelength, amplitude, and period) and explain the relationship among them. **Recognize** examples of simple harmonic motion.

Physics 4.2 – **Distinguish** between mechanical and electromagnetic waves.

Physics 6.1 – **Recognize** that electromagnetic waves are transverse waves and travel at the speed of light through a vacuum.

Physics 6.2 – **Describe** the electromagnetic spectrum in terms of frequency and wavelength and identify the location of radio waves, microwaves, infrared radiation, visible light, ultraviolet rays, x-rays, and gamma rays on the spectrum.

Unit/Topic./Lesson

Light
Early concepts of light
The speed of light
Electromagnetic waves
Light and Transparent materials
Opaque materials
Shadows

Objectives (Students Will...)

Describe the dual nature of light
Explain why it is difficult to measure the speed of light
Describe the relationship among light, radio waves, microwaves, and X-rays
Explain how the frequency of light affects what happens when it enters a substance
Describe opaque materials
Describe solar and lunar eclipses
Describe the evidence that suggests that light waves are transverse
Describe 3-D vision

Essential Question

What is light?

Labs/Demonstrations/Handouts

Demo: Polarization

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 27
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources
-

Assessment Activities

Chapter 27 Review
Chapter 27 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 27 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 25

Performance Standards

Physics 4.1 – **Describe** the measurable properties of waves (velocity, frequency, wavelength, amplitude, and period) and **explain** the relationship among them. Recognize examples of simple harmonic motion.

Physics 6.2 – **Describe** the electromagnetic spectrum in terms of frequency and wavelength and identify the location of radio waves, microwaves, infrared radiation, visible light, ultraviolet rays, x-rays, and gamma rays on the spectrum.

Unit/Topic./Lesson

Color
Color spectrum
Color by reflection
Color by transmission
Sunlight
Complementary colors
Mixing colored pigment
Why the sky is blue
Why sunsets are red
Why water is greenish-blue
Atomic spectra

Objectives (Students Will...)

Explain why white and black are not true colors
Describe how the reflection of light affects an object's color
Describe what determines whether a material reflects, transmits or absorbs light of a particular color
Describe white light
Explain that color television tubes produce only red, green, and blue light
Define complementary colors
Describe color mixing by subtraction and by addition
Explain why the sky is blue, why sunsets are red, and why water is greenish-blue
Explain how a spectrum can be used to identify the presence of an element

Essential Question

How do we see colors?

Labs/Demonstrations/Handouts

Demo: Mixing colored light

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 28
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 28 Review
Chapter 28 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 28 Worksheets
Test: Chapter 27 & 28

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 26

Performance Standards

Physics 4.4 – **Describe** the basic principles of reflection, refraction, and diffraction of waves. **Explain** the relationship between the speed of a sound wave and the medium it travels through

Unit/Topic./Lesson

Reflection and Refraction
Law of Reflection
Mirrors
Diffuse reflection
Reflection of Sound
Refraction
Refraction of Sound
Atmospheric Refraction
Dispersion in a prism
The Rainbow
Total internal reflection

Objectives (Students Will...)

Describe what happens to light when it strikes different materials
Describe the law of reflection
Explain why a mirror forms a virtual image
Describe diffuse reflection
Give examples of ways to control reflected sound
Explain the change in direction of a wave when it crosses a boundary between media
Describe the effects of refraction of sound waves
Describe the effects of refraction of light
Explain how mirages are formed
Describe how a rainbow is formed
Describe total internal reflection, its effects, and its applications

Essential Question

What are interference and diffraction?

Labs/Demonstrations/Handouts

Demo: Refraction of light

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 29
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 29 Review
Chapter 29 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 29 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 27

Performance Standards

Physics 4.4 – **Describe** the basic principles of reflection, refraction, and diffraction of waves. **Explain** the relationship between the speed of a sound wave and the medium it travels through

Unit/Topic./Lesson

Lenses
Converging and Diverging lenses
Image formation by a lens
Constructing images through Ray Diagrams →practice sheets!
Image formation summarized
Some common optical instruments
The eye
Some defects in vision
Some defects in lenses

Objectives (Students Will...)

Distinguish between converging and diverging lenses
Distinguish between real images and virtual images formed by lenses
Construct ray diagrams that show the positions of images formed by lenses
Summarize image formation
Describe the use of lenses in optical instruments
Explain how the human eye forms images
Explain the causes of near-sightedness, farsightedness, and astigmatism
Describe the effects of aberration in lenses

Essential Question

What does a lens do?

Labs/Demonstrations/Handouts

Lab: Center of Focus

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 30
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 30 Review
Chapter 30 Problems
Plug & Chug, Think &Explain, Think & Solve
Practice sheets - Constructing images through Ray Diagrams
Test: Chapter 29 & 30

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 28

Performance Standards

Physics 5.1 – **Recognize** that an electric charge tends to be static on insulators and can move on conductors, and that mechanical energy can produce charge separation.

Physics 5.4 – **Describe** conceptually the attractive or repulsive forces between objects relative to their charges and the distance between them (Coulomb's law).

Unit/Topic./Lesson

Electrostatics
Electrical forces and Charges
Conservation of Charge
Coulomb's Law
Conductors and Insulators
Charging by Friction and contact
Charging by induction
Charge polarization

Objectives (Students Will...)

Describe electrical forces between objects
Explain how an object becomes (a) positively charged and (b) negatively charged
Describe Coulomb's law
Distinguish between a conductor and an insulator
Describe how an insulator can be charged by friction and by contact
Describe how a conductor can be charged without contact
Describe how an insulator can be charged by charge polarization

Essential Question

What are electric charges and electric forces?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 32
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 32 Review
Chapter 32 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 32 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 29

Performance Standards

Physics 5.1 – **Recognize** that an electric charge tends to be static on insulators and can move on conductors, and that mechanical energy can produce charge separation.

Unit/Topic./Lesson

Electric Fields and Potential
Electric Fields
Electric Field Lines
Electric shielding
Electric potential energy
Electric potential
Electric energy storage
The Van de Graaff Generator

Objectives (Students Will...)

Describe how to measure the strength of an electric field at different points
Describe how electric fields are represented by vectors and by electric field lines
Describe how objects can be completely shielded from electric fields
Explain why a charged object in an electric field is considered to have electrical potential energy
Distinguish between electrical potential energy and electric potential
Describe how electrical energy can be stored
Describe the operation of a Van de Graaff generator

Essential Question

What is electric current?

Labs/Demonstrations/Handouts

Labs: Battery and bulb

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 33
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 33 Review
Chapter 33 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 33 Worksheets
Test: Chapter 32 & 33

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 30

Performance Standards

Physics 5.2 – **Develop** a qualitative and quantitative understanding of current, voltage, resistance, and the connection between them (Ohm's law).

Physics 5.5 – **Explain** how electric current is a flow of charge caused by a potential difference (voltage) and how power is equal to current multiplied by voltage.

Unit/Topic./Lesson

Electric Current
Flow of Charge
Electric current
Voltage sources
Electric Resistance
Ohm's law and electric shock
Direct current and alternating current
Converting AC to DC
The speed of electrons in a circuit
The source of electrons in a circuit
Electric power

Objectives (Students Will...)

Describe the flow of electric charge
Describe what is happening inside a current-carrying wire
Give examples of voltage sources that can maintain a potential difference in a circuit
Describe the factors that affect the resistance of a wire
Describe Ohm's law
Explain the causes of electric shock
Distinguish between DC and AC and describe how AC is converted to DC
Compare the drift speed of conduction electrons in a current-carrying wire to the signal speed of changes in current
Compare the motion of electrons in a wire carrying AC to the flow of energy through the wire
Relate the electric power used by a device to the current and voltage

Essential Question

What are series and parallel circuits?

Labs/Demonstrations/Handouts

Labs: Circuits

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 34
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 34 Review
Chapter 34 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 34 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 31

Performance Standards

Physics 5.2 – **Develop** a qualitative and quantitative understanding of current, voltage, resistance, and the connection between them (Ohm's law).

Physics 5.3 – **Analyze** simple arrangements of electrical components in both series and parallel circuits. **Recognize** symbols and understand the functions of common circuit elements in a schematic diagram

Physics 5.5 – **Explain** how electric current is a flow of charge caused by a potential difference (voltage) and how power is equal to current multiplied by voltage.

Unit/Topic./Lesson

Electric circuits
A battery and a bulb
Electric circuits
Series circuits
Parallel circuits
Schematic diagrams

Objectives (Students Will...)

Describe the configuration of a working circuit
Distinguish between series and parallel circuits
Describe the characteristics of series connections and of parallel connections
Interpret circuit diagrams

Essential Question

What is a circuit?

Labs/Demonstrations/Handouts

Labs: Circuits

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 35
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 35 Review
Chapter 35 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 35 Worksheets
Lab Sheet

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 32

Performance Standards

Physics 5.2 – **Develop** a qualitative and quantitative understanding of current, voltage, resistance, and the connection between them (Ohm's law).

Physics 5.3 – **Analyze** simple arrangements of electrical components in both series and parallel circuits. **Recognize** symbols and understand the functions of common circuit elements in a schematic diagram

Physics 5.5 – **Explain** how electric current is a flow of charge caused by a potential difference (voltage) and how power is equal to current multiplied by voltage.

Unit/Topic./Lesson

Electric circuits
Combining resistors in a compound circuit
Parallel circuits and overloading

Objectives (Students Will...)

Determine the equivalent resistance of circuits having two or more resistors
Explain the cause and prevention of overloading household circuits

Essential Question

What happens in a compound circuit?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 35
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 35 Review
Chapter 3 5Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 35 Worksheets
Test: Chapter 34 & 35

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 33

Performance Standards

Physics 5.6 – **Recognize** that moving electric charges produce magnetic forces and moving magnets produce electric forces. **Recognize** that the interplay of electric and magnetic forces is the basis for electric motors, generators, and other technologies.

Unit/Topic./Lesson

Magnetism
Magnetic poles
Magnetic fields
The nature of a magnetic field
Magnetic domains
Electric currents and magnetic fields

Objectives (Students Will...)

Compare and contrast magnetic poles and electric charges
Use iron filings to **interpret** the strength of a magnetic field at different points near a magnet
Relate the motion of electrons within a material to the ability of the material to become a magnet
Describe what happens to the magnetic domains of iron in a presence of a strong magnet
Describe the magnetic field produced by a current-carrying wire
Describe how a magnetic field exerts a force on a charged particle in the field

Essential Question

What is a magnet?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 36
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 36 Review
Chapter 36 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 36 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 34

Performance Standards

Physics 5.6 – **Recognize** that moving electric charges produce magnetic forces and moving magnets produce electric forces. **Recognize** that the interplay of electric and magnetic forces is the basis for electric motors, generators, and other technologies.

Unit/Topic./Lesson

Magnetism
Magnetic forces on moving charged particles
Magnetic forces on current-carrying wires
Meters to motors
The Earth's magnetic field

Objectives (Students Will...)

Describe some practical applications of a magnetic field exerting a force on a current-carrying wire
Describe how a galvanometer and a motor work
Suggest possible causes for Earth's magnetic field
Describe how voltage is induced in a coil of wire
State and **explain** Faraday's law
Describe how a generator works

Essential Question

How are current and magnets related?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 36
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 36 Review
Chapter 36 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 36 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 35

Performance Standards

Physics 5.6 – **Recognize** that moving electric charges produce magnetic forces and moving magnets produce electric forces. **Recognize** that the interplay of electric and magnetic forces is the basis for electric motors, generators, and other technologies.

Unit/Topic./Lesson

Electromagnetic Induction
Faraday's Law
Generators and alternating current
Motor and Generator comparison
Transformers

Objectives (Students Will...)

Compare and contrast motors and generators
Describe how a transformer works
Explain why transformers are used for transmission of electric power

Essential Question

How are magnetism and electricity related?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 37
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 37 Review
Chapter 37 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 37 Worksheets

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster

Week 36

Performance Standards

Physics 5.6 – **Recognize** that moving electric charges produce magnetic forces and moving magnets produce electric forces. **Recognize** that the interplay of electric and magnetic forces is the basis for electric motors, generators, and other technologies.

Unit/Topic./Lesson

Electromagnetic Induction
Power transmission
Induction of electric and magnetic fields
Electromagnetic waves

Objectives (Students Will...)

Relate the magnitude and direction of an induced electric field to the inducing magnetic field, and vice versa
Describe electromagnetic waves

Essential Question

What are transformers?

Labs/Demonstrations/Handouts

Teacher Resources

- Hewitt Conceptual Physics (1997) Chapter 37
- Content Outline WS
- Transparency Activity WS
- Enrichment/reinforcement WS

Media Resources

- Power Point Presentations
- Virtual Labs CD-ROM
- Internet labs and resources

Assessment Activities

Chapter 37 Review
Chapter 37 Problems
Plug & Chug, Think &Explain, Think & Solve
Chapter 37 Worksheets
Test: Chapter 36 & 37

Completion date:

Completed by:

Comments: ***Alternative Evaluation:***
Paper, Project, Poster