



2014-2015 Science Supply List

Physics

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UNIT 1: KINEMATICS

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|--|---|------------|---|
| Experiment: Making A Soda Straw Balance | In this experiment, you will experiment with using materials from around the house to make a fairly accurate instrument! | Yes | <ul style="list-style-type: none"> • 1 screw • 1 paper straw • 2 microscope slides • 1 needle • 1 ruler <ul style="list-style-type: none"> • 1 razor blade or scissors • 1 small wood block • 1 tongue depressor • 1 clothespin • paper |
| Experiment: Making a Simple Model of the Solar System | In this experiment, you will make a simple model of the solar system by using a roll of adding machine tape and a ruler or meter stick. | No | <ul style="list-style-type: none"> • 1 roll of adding machine tape • 1 ruler or meter stick • a pen or pencil |
| *Project: Tutorial for Making a Scatter Plot Using an Electronic Spreadsheet Program | In this project you will be designing a scatter plot (a type of line graph) based on information given to you in a data table. | No | <ul style="list-style-type: none"> • Microsoft® Excel® |
| Experiment: Determining Reaction Time | In this experiment, you will determine your reaction time for catching a free falling object. | No | <ul style="list-style-type: none"> • a partner • metric ruler |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 2: DYNAMICS

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|-----------------------------|--|------------|--|
| *Report: Isaac Newton | In this report, you will prepare a report on the life of Sir Isaac Newton, his accomplishments, discoveries, books written, and honors received. | No | <ul style="list-style-type: none"> research resources |
| Experiment: Circular Motion | In this experiment, you will test how well theory fits results as predicted by equations for centripetal motion, make and interpret graphs, and make valid conclusions concerning the data. | Yes | <ul style="list-style-type: none"> glass or plastic tube (the barrel of a used stick pen can be used for this part) string 2 stoppers glass or plastic tube (the barrel of a used stick pen can be used for this part) string 2 stoppers |
| *Experiment: Collisions | In this experiment, you will plan and implement an investigative procedure to verify the validity of the conservation of momentum laws, analyze data and present findings for peer review, research and compare to previous findings using similar mechanisms, and communicate results | No | <ul style="list-style-type: none"> 2 carts (one with a spring) 2 clamps table, 1 1/2 m. long 2 boards meter stick assorted standard masses |
| *Report: Solar System | In this report, you will briefly outline the chronological development of the theory and dates of the men who proposed the models of the system. Also prepare an 800 word detailed report of the life and times of Johannes Kepler and the steps taken that led him to each of his planetary laws of motion. | No | <ul style="list-style-type: none"> research resources |
| *Experiment: Kepler's Law | In this experiment, you will make measurements with precision using the data provided, analyze and evaluate to determine the validity of Kepler's Second Law, and communicate findings | No | <ul style="list-style-type: none"> sharp pencil small ruler |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 3: WORK AND ENERGY

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|-----------------------------|---|-------------------|---|
| *Report: Nuclear Energy | In this report, you will evaluate the impact of scientific research and technology on society and the environment and describe connections between the various branches of science involved in the nuclear question (physics, chemistry, and biology) | No | <ul style="list-style-type: none"> research resources |
| Experiment: Simple Machines | In this investigation you will use a lever as a simple machine, and calculate its mechanical advantage and efficiency. | Yes | <ul style="list-style-type: none"> meter stick string weights |
| *Experiment: Latent Heat | In this investigation you will determine an experimental value for the latent heat of fusion of water. | No | <ul style="list-style-type: none"> aluminum calorimeter (or an aluminum tumbler and a Styrofoam cup) analytical balance paper towel crushed ice Celsius thermometer cardboard lid |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 4: INTRODUCTION TO WAVES

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|------------------------------|--|------------|--|
| Experiment: Wave Speeds | In this experiment, you will investigate the effect of the medium on wave speeds. | No | <ul style="list-style-type: none"> • Slinky® • stopwatch • meter stick |
| *Experiment: Pulses | In this experiment, you will formulate a testable hypothesis concerning how pulses transfer energy, make qualitative observations, analyze and predict trends from data, and communicate conclusions | No | <ul style="list-style-type: none"> • Slinky® |
| Experiment: Waves | In this investigation you will observe the reflection of waves from a barrier in a ripple tank. | Yes | <ul style="list-style-type: none"> • ripple tank with dampers • high intensity light source • white paper • protractor • electrical wave generator • paraffin blocks • thick wooden dowel |
| * Experiment: Bending Waves | In this experiment, you will observe the bending of waves across the boundary between "different media" by using a submerged glass plate in the ripple tank to change the depth of the water. | No | <ul style="list-style-type: none"> • ripple tank • light source • white paper • wave generator • glass plate • washers • paraffin blocks |
| * Experiment: Doppler Effect | In this investigation you will observe the Doppler effect with water waves. | No | <ul style="list-style-type: none"> • ripple tank • light source • white paper • wave generator |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 5: LIGHT

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|----------------------------------|---|------------|--|
| Experiment: Light Angles | In this investigation you will study the angles that light makes as it is incident on a mirror. | Yes | <ul style="list-style-type: none"> • small purse-sized rectangular or square mirror • pencil • flashlight <ul style="list-style-type: none"> • sheet of paper • ruler • protractor • ball bearing |
| *Experiment: Water Refraction | In this investigation you will examine the refraction of light through water. | No | <ul style="list-style-type: none"> • semicircular plastic dish • ruler • protractor <ul style="list-style-type: none"> • 15 pins • sheet of graph paper • corrugated cardboard |
| Experiment: Convergence | In this investigation you will observe convergence of waves, using a ripple tank. | Yes | <ul style="list-style-type: none"> • ripple tank • rubber hose <ul style="list-style-type: none"> • wooden dowel • light source |
| * Experiment: Light Observations | In this investigation you will observe light through a single narrow slit and measure the width of the slit and the frequency of light. | No | <ul style="list-style-type: none"> • razor blade • lamp • red filter • blue filter <ul style="list-style-type: none"> • razor blade • lamp • red filter • blue filter |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 7: STATIC ELECTRICITY

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|---------------------------------|---|------------|---|
| *Experiment: Static Electricity | In this classic experiment you will actually witness the transfer of electrons from one object to another for yourself. | No | <ul style="list-style-type: none"> • glass wand • Bakelite (or hard rubber) wand • silk cloth <ul style="list-style-type: none"> • stand • pith ball • silk thread • wool cloth (or cat's fur) |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 8: ELECTRIC CURRENTS

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|-------------------------------|--|------------|--|
| *Project: Research and Report | In this project, you will research and describe the impact of early electrical theorists on the development of society, economics and technology | No | <ul style="list-style-type: none"> research resources |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed. | No | N/A |

*indicates alternate project/experiments

UNIT 9: MAGNETISM

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|--------------------------------------|---|------------|---|
| *Experiment: Magnetic Fields | In this experiment you will be able to answer three questions about magnetic field lines. | No | <ul style="list-style-type: none"> 2 bar magnets 3 sheets of stiff cardboard iron filings |
| *Experiment: Induced Magnetic Fields | In this investigation, you will determine the shape of the magnetic field around a long, straight wire. | No | <ul style="list-style-type: none"> copper wire, about 1 m long small porcelain lamp socket and bulb wire cutter or 8-inch scissors drycell compass |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed | No | N/A |

*indicates alternate project/experiments

UNIT 10: ATOMIC AND NUCLEAR PHYSICS

| Assignment Title | Project Summary | Video Demo | Materials Needed |
|------------------------------|---|------------|--|
| Report: Early Atomic Physics | In this report, you will research and describe the impact of early atomic theorists on the development of society, economics and technology | No | <ul style="list-style-type: none"> • research resources |
| *Special Project | Special Project assignments are used by teachers to create their own projects if needed | No | N/A |

*indicates alternate project/experiments