



Switched-On

SCHOOLHOUSE® 2012 EDITION

Supply List

Integrated Physics and Chemistry

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Please have a pencil, paper and access to a printer available for all projects by default.

UNIT 1: EXPLORATIONS IN PHYSICAL SCIENCE

Assignment # and Title	Project Summary	Video Demo	Materials Needed
4. Experiment: Making Observations	In this experiment, you will choose one peanut from a bowlful and make "identifying observations" about the peanut.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> various measuring tools (metric rulers, string, etc.) bowl of peanuts in their shells paper and pencil
9. Experiment: Determining Volume	In this experiment, you will attempt to determine the volume of two objects using the formula method and the water displacement method.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> metric ruler small block of wood
11. Experiment: Determining Density	In this experiment, you will recognize the characteristics of density, design and carry out a scientific investigation, and present your findings in a scientific report.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> a penny, a nickel, and a quarter metric ruler metric balance scissors
12. Experiment: Density Column	In this experiment, you will recognize the characteristics of density, design and carry out a scientific investigation, and present your findings in a scientific report.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> Karo syrup or molasses cooking oil red solution blue solution piece of paraffin raisin peanut or cashew paperclip small plastic cups eye droppers laboratory balance 50-mL graduated cylinder (or larger)
14. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 2: THE STRUCTURE OF MATTER

Assignment # and Title	Project Summary	Video Demo	Materials Needed
2. Experiment: Atomic Structure	In this experiment, you will have a chance to test the hypothesis that Ernest Rutherford used when determining the size of the nucleus.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> large box (at least 40 to 50 cm along all sides) small block of wood (around 6 to 8 cm along all sides) 100 marbles or pellets (airsoft pellets work well) ruler
8. Experiment: Identifying an Unknown	In this experiment, you will use at least one physical test to try to determine the identity an element.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> metric balance graduated cylinder ruler small paper cup containing one or more metal pieces (aluminum foil, aluminum tabs from soda cans, aluminum or steel paper clips, copper wiring or tubing, steel wire, iron nails, aluminum nails, lead sinkers or pellets, brass connectors, zinc or copper sheet metals)
13. Experiment: Separating a Mixture	In this experiment, you will use physical properties of various substances to separate a mixture into its various components.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> mixture containing salt, iron filings, sand, gravel, and raisins filter paper (see diagram below for directions on use) screens funnel beakers ring stand and ring magnet
15. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 3: MATTER AND CHANGE

Assignment # and Title	Project Summary	Video Demo	Materials Needed
3. Experiment: Graphing Changes of State	In this experiment, you will use your knowledge of changes of state to hypothesize how you will determine when the water sample is boiling, observe and collect accurate data as the water changes state, do a graphical analysis of data obtained during experimentation, and interpret graphical information with respect to changes of state and latent energy.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> coarsely crushed ice (about 8 ice cubes or enough to half fill a 500-mL beaker) Bunsen burner or hot plate (stove on low setting may be used) Pyrex beaker (use a small metal pan if a stove is used) string or wire Celsius thermometer ring stand with ring & supports (see diagram) time piece with second hand digital camera (optional)
6. Experiment: The Cabbage Indicator	In this experiment, you will test various household substances to determine if a solution is an acid or a base by using red cabbage leaves as a pH indicator.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> sliced red cabbage stainless steel cooking container food strainer collection beaker coffee filter white vinegar baking soda (or ammonia) distilled water (for control) several small, clear plastic cups (3-oz [90-mL] bathroom cups work well for this purpose) two pieces of notebook paper at least 6 household liquids for testing (suggestions: clear soda-pop, clear shampoos or liquid soap solutions, clear or light-colored fruit or vegetable juices, rain from a recent storm, water with soil fertilizer dissolved in it, etc.)
10. Experiment: Chemical Changes	In this experiment, you will identify physical and chemical changes and identify indicators of a chemical change.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> small utility candle and holder matches metric balance 3 small sheets of paper watch glass 3 test tubes table salt (NaCl) calcium chloride (CaCl₂) baking soda (NaHCO₃) magnesium ribbon 1M hydrochloric acid (muriatic acid)
16. Experiment: Half-Life	In this experiment, you will use candy to simulate the decay of a radioactive isotope and then describe what is meant by the half-life of a radioactive element.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> 100 small candy pieces with printing or design on one side only (M&M™, Reese's pieces™, etc.) resealable plastic bag or clean plastic box with lid sheet of wax paper, approximately 30 cm x 30 cm plastic knife plastic cup graph paper
19. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 4: STATES OF MATTER

Assignment # and Title	Project Summary	Video Demo	Materials Needed
2. Experiment: Comparing Hardness and Density of Solids	In this experiment, you will compare several solids to determine if there is a relationship between the hardness of a sample and its density.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> at least six of the following solid samples (some are crystals, others amorphous): aluminum, amber, calcite, chalcopryrite, dolomite, feldspar (orthoclase or anorthite), fluorite, galena, gypsum, hematite, ice, iron, magnetite, mica (muscovite or biotite), pyrite, quartz, ulexite your own fingernails copper penny (pre-1981) dissection knife (from a biology dissection kit) steel nail or file metric balance graduated cylinder overflow can (optional, may be necessary for some samples) graph paper
7. Experiment: Viscosity	In this experiment, you will compare the viscosity of several liquids.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> egg carton scissors or nail several straws cardboard (for ramp) tape 1-inch block, a book, or other support ramp (see images below) stopwatch or watch with second hand several test liquids (e.g., water, ketchup, honey, olive oil, molasses, syrup, heavy cream, vegetable oil) microwave beaker or measuring cup
14. Experiment: Pressure in Gases	In this experiment, you will determine the air pressure in the tires of a car using an indirect method.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> a car and licensed driver the car manual (for information) air pressure gauge 16 sheets of paper or thin cardboard tape
17. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 5: MOTION AND FORCES

Assignment # and Title	Project Summary	Video Demo	Materials Needed
5. Experiment: Motion Graphs	In this experiment, you will design an experiment to determine the velocity of a battery-powered toy car and perform an experiment to determine the type of motion experienced by a non-powered toy car traveling down a ramp.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> battery-powered toy car non-powered toy car meter stick books to prop up ramp stopwatches (one for each timer) or second hand on clock long board (at least 2 meters) for ramp
11. Experiment: Propulsion	In this experiment, you will experiment with other applications of Newton's third law.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> balloon empty soda pop can sharp nail hammer fishing line or strong thread bowl of water
14. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 6: SEMESTER REVIEW AND EXAM

Assignment # and Title	Project Summary	Video Demo	Materials Needed
N/A	N/A	N/A	N/A

UNIT 7: WORK AND ENERGY

Assignment # and Title	Project Summary	Video Demo	Materials Needed
5. Experiment: Conservation of Energy	In this experiment, you will describe the relationship between the potential energy of an object and the amount of kinetic energy it can gain in a gravitational field and describe how the kinetic energy of an object relates to the amount of mechanical energy it can transfer to another object.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> cardboard tube (from gift wrap or paper towels) box (cut from lightweight cardboard, such as a gift box, using the pattern below) four marbles of different masses meter stick tape scissors book metric balance
12. Experiment: Inclined Planes	In this experiment, you will determine the IMA, AMA, and efficiency for inclined planes with different slopes.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> smooth block or other object to drag up the plane (approximately 200 to 500 grams) spring scale (calibrated in newtons) smooth board string books or blocks to support the inclined plane meter stick
14. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 8: HEAT FLOW

Assignment # and Title	Project Summary	Video Demo	Materials Needed
4. Experiment: Insulators	In this experiment, you will compare the heat-retaining ability of several insulators.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> large Styrofoam cup small Styrofoam cup flat piece of Styrofoam thermometer hot water heat source for heating water clock with second hand <ul style="list-style-type: none"> at least two insulating materials (shredded newspaper, sheets of newspaper, bits of cloth, small Styrofoam peanuts, bubble wrap, feathers, aluminum foil, saw dust, etc.)
7. Experiment: Heat and Expansion	In this experiment, you will investigate the phenomenon of thermal expansion.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> beaker or pan for heating water medium test tube one-holed stopper to fit test tube glass tube to fit through stopper grease pencil <ul style="list-style-type: none"> food coloring hot plate for heating water large round balloon marker tape measure freezer
11. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 9: ELECTRICITY AND MAGNETISM

Assignment # and Title	Project Summary	Video Demo	Materials Needed
3. Experiment: Electrostatic Investigations	In this experiment, you will investigate the principles of electrostatics using adhesive tape.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> clear adhesive tape <ul style="list-style-type: none"> plastic straw
10. Experiment: Diverting a Magnetic Field	In this activity, you will explore how to divert magnetic fields away from sensitive circuits	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> strong disk magnet plastic drinking straw tape double-stick tape or glue paperclips cardboard from cereal or cake mix box <ul style="list-style-type: none"> test materials such as pennies, aluminum foil, an iron or steel nail, cardboard, crayons, a table knife, or a popsicle stick compass paper
13. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 10: WAVES

Assignment # and Title	Project Summary	Video Demo	Materials Needed
4. Experiment: Changing the Speed of a Wave	In this experiment, you will recognize the relationship between the stiffness of the medium and the speed of a wave and the relationship between the density of the medium and the speed of a wave.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> • plastic box • paperclips
9. Experiment: Using Vibrations to Produce Sound	In this experiment, you will investigate how small changes in the structure of a sound-producing object can affect the pitch of the sound produced.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> • a tuning fork • wooden ruler • plastic bowl (for water)
16. Experiment: Law of Reflection	In this experiment, you will verify the law of reflection and learn a technique with which to analyze your results scientifically.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> • small rectangular or square plane mirror • block of wood to support mirror
19. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 11: CHEMISTRY AND PHYSICS IN OUR WORLD

Assignment # and Title	Project Summary	Video Demo	Materials Needed
2. Experiment: Carbon Dioxide and Water Acidity	In this experiment, you will relate levels of dissolved carbon dioxide to pH.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> three 12-inch balloons measuring tape twist tie bicycle tire air pump CO2 cartridge bicycle tire pump <ul style="list-style-type: none"> one-hole stopper with glass tube inserted four 100-mL beakers 100-mL graduated cylinder pH paper, acid range
4. Experiment: Water Acidity and the Environment	In this experiment, you will make observations to determine which types of materials are especially affected by acidic environments.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> sand paper vinegar fresh water small jar with lid several small paper or plastic cups or small beakers a raw egg (2) small sea shells (2) pieces of coral (2) pennies (use sand paper to remove any surface build-up) <ul style="list-style-type: none"> (2) iron or steel nails (use sand paper to remove any surface build-up) (2) chips of marble, concrete, brick (2) various rock samples (slate, limestone, quartz) (2) pieces of chalk (2) small glass beads or other pieces of glass (2) small plastic beads or other pieces of plastic
9. Experiment: Kepler's Second Law	In this experiment, you will use actual data from observations made of the orbit of Mercury to test Kepler's second law, also known as the law of equal areas.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<ul style="list-style-type: none"> centimeter graph paper scissors poster board <ul style="list-style-type: none"> triple beam balance centimeter ruler tape
11. Special Project	Special Project assignments are used by teachers to create their own projects if needed.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	N/A

UNIT 12: SEMESTER REVIEW AND EXAM

Assignment # and Title	Project Summary	Video Demo	Materials Needed
N/A	N/A	N/A	N/A

UNIT 13: FINAL EXAM

Assignment # and Title	Project Summary	Video Demo	Materials Needed
N/A	N/A	N/A	N/A