

Physics Complete Experiences Kit

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CLASSROOM MATERIALS KIT LIST

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MOTION PLOTS

Materials Included in Kit *(for 10 groups of students)*

- Graphing paper, 100 sheets
 - Masking tape, $\frac{3}{4}$ ", 2 rolls
 - Metric, tape measure, 10
-

FREE FALL ACCELERATION

Materials Included in Kit *(for 10 groups of students)*

- Ball, steel, $1\frac{1}{3}$ "-diameter, 10
 - Ball, steel, $\frac{5}{8}$ "-diameter, 10
 - Ball, Styrofoam, 1"-diameter
 - Ball, Styrofoam, 2"-diameter
 - Foam pad
-

MODEL PROJECTILE MOTION

Materials Included in Kit *(for 8 groups of students)*

- Ball, steel, $\frac{3}{4}$ " -diameter, 8
 - Inclined plane with 4 holes, wood, 8
 - Aluminum support rod, 8
 - Washer, flat, stainless steel, 16
 - Wing nut, 16
 - String, 1 ball
 - Pan screw, 16
 - Hexagonal screw, 16
 - Hexagonal nut, 16
 - Aluminum metal sheet, 4" × 4", 8
 - Washer, flat, 3/8" hole, 8
-

DESIGN AN AIRDROP SYSTEM

Materials Included in Kit *(for 10 groups of students)*

- Index cards, 100
 - Paper cup, 30
 - Marble, glass, 15
 - String, thin ball, 1
 - Fishing line, monofilament, 1 roll
 - Sand, yellow, 2 lb bag, 4
 - Weighing dish, 10
 - Paperclip, jumbo, 100
-

FORCES AND MOTION

Materials Included in Kit *(for 10 groups of students)*

- Cart (Hall's carriage), 10
 - Pine board (car stopper), 10
 - Plastic bag, 10
 - Pulley with table clamp, 10
 - String ball, 1
 - Washers, 150
-

THE BUOYANT FORCE

Materials Included in Kit *(for 10 groups of students)*

- BBs, copper-coated steel, 1500/ box, 1 box
 - Coarse gravel, 200 g
 - Iron fillings, non-rusting, 1 pkg
 - Paperclips, jumbo, 100
 - Sand (silicone dioxide), 200 g
 - Spring scale, 5 N, 10
 - Vials, snap-seal, 50
-

FRICTION

Materials Included in Kit *(for 10 groups of students)*

- Sandpaper strip, 3" × 12", 10
 - Wood block with attached mirror and eyebolt, 10
 - Wood block with eyebolt, 10
-

MECHANICAL WEATHERING OF ROCK

Materials Included in Kit *(for 10 groups of students)*

- Granite chips, 1000 g
 - Halite chips, 500 g
 - Marble chips, 500 g
 - Sand, 500 g
 - Magnifying glass, 10
 - Polystyrene tray, 10
 - Sample containers and lids, 30
 - Spoon, plastic, 10
 - Weighing dish, 10
-

LANDSLIDE PREVENTION

Materials Included in Kit *(for 10 groups of students)*

- Plastic bottle, 2-L, 10
 - Plastic cups, 30
 - Soil
-

INVESTIGATE GRAVITY USING PENDULUMS

Materials Included in Kit *(for 10 groups of students)*

- Clothespin, 25
 - Protractor, 10
 - Steel ball, $\frac{3}{4}$ "-diameter, drilled, 10
 - Steel ball, 1"-diameter, drilled, 10
 - String, roll, 1
-

MODEL THE ORBITAL MOTION OF PLANETS

Materials Included in Kit *(for 10 groups of students)*

- Handle tube, 10
 - Paper clips, 100
 - Rubber stopper, two-hole, 10
 - String, 20 yd
 - Washers, 200
-

KEPLER'S LAWS OF PLANETARY MOTION

Materials Included in Kit *(for 10 groups of students)*

- Adhesive-back felt bumper, 40
 - Bolts, 20
 - Hexagonal nuts, 60
 - Planetary Orbits platform, 10
 - String, thin, 1 ball
 - Washers, 10
-

DEFY GRAVITY

Materials Included in Kit *(for 10 groups of students)*

- Hydrochloric acid, 3 M, 250 mL
 - Hydrogen peroxide, 3%, 237 mL
 - Yeast package, 1
 - Zinc, mossy, Zn, 100 g
 - Pipet, Beral-type, graduated, 80
 - Wood splints, 30
-

ELECTRIC CHARGES AND COULOMB'S LAW

Materials Included in Kit *(for 10 groups of students)*

- Aluminum foil, 12" × 12" Sheet
 - Fishing line, monofilament, 1 box
 - Pith balls, 36
 - Plastic straws, 50
 - Tape, transparent, matte finish, 2
 - Wool friction pads, 10
-

ELECTRIC FIELDS

Materials Included in Kit *(for 8 groups of students)*

- Conductive paper, 8½" × 11", 10
 - Conductive silver ink pen, 2
 - Corks, 100
 - Pushpins, aluminum, 20
 - Pushpins, plastic, 100
-

ELECTRICAL RESISTANCE AND RESISTIVITY

Materials Included in Kit *(for 10 groups of students)*

- Electrical tape, black, 1 roll
 - Multimeter, digital, 1
 - Nichrome wire, 16-gauge, 15 m
 - Nichrome wire, 18-gauge, 15 m
 - Nichrome wire, 22-gauge, 15 m
-

DESIGN AN ELECTRONIC QUIZ BOARD

Materials Included in Kit *(for 10 groups of students)*

- Connector cords with alligator clips, 30
 - Lamp receptacles, 10
 - Miniature lightbulbs, 3.7 V, 15
 - Manila folders, 10
 - Paper clips, large, 200
 - PVC-insulated wire, 22 gauge, 100 ft
-

MAGNETIC FORCE AND SEPARATION DISTANCE

Materials Included in Kit *(for 8 groups of students)*

- Blue magnetic marbles, 8
 - Compasses, 8
 - Iron filings, 100 g
 - Neodymium magnets, 16
 - Paper clips, 100
 - Petri dishes, 8
 - Plastic containers, large, 8
 - Plastic containers, small, 8
 - PVC tubes, 8
 - String, 331 m
-

ELECTROMAGNETS AND MAGNETISM

Materials Included in Kit *(for 8 groups of students)*

- Aluminum rod, 8
 - Brass rod, 8
 - Compasses, 8
 - Copper rod, 8
 - Cups, polystyrene, 8
 - Index cards, pkg. 100
 - Iron nails, 10
 - Magnet wire, 22 gauge, 125 ft
 - Neodymium magnets, 10
 - Paper clips, box of 100
 - Sandpaper, 9" x 11" sheet
-

INDUCTION OF ELECTRICAL CURRENT

Materials Included in Kit *(for 8 groups of students)*

- Bottle, 60 mL, 10
 - Cardboard tube, 8
 - Iron nail, 10
 - LED, red, 10
 - Magnet wire, 22 gauge, 125 ft
 - Magnet wire, 30 gauge, 200 ft
 - Neodymium magnet, 20
 - Sandpaper, 9" x 11" sheet
-

BUILD A FLASHLIGHT WITHOUT BATTERIES

Materials Included in Kit *(for 5 groups of students)*

- Breadboard, 5
 - Breadboard switches, SPDT, slide-type, 5
 - Capacitor, electrolytic, 1-F, 5.5 V, 5
 - Diodes, 20
 - Jumper wire, PVC insulated, 22 gauge, 10 ft
 - LED, red, 5
 - Magnet wire coil, 30 gauge, 600ft, 5
 - Neodymium magnets, 15
 - Plastic tube, 5 ½" x 0.75" o.d., 5
 - Resistor, 110-ohm, 5
-

INDIRECT OBSERVATION OF THE ATOM

Materials Included in Kit *(for 6 groups of students)*

- Blotting paper, 12" x 19", 36 sheets
 - Cardboard square, 17" x 17", 6 sheets
 - Laser pointer, 6
 - Plastic strip, 3" x 88", 6
 - Plexiglas mirrors, 2 ½" x 3 ½", 18
-

COHESIVE FORCES AND SURFACE TENSION

Materials Included in Kit *(for 10 groups of students)*

- Chenille wires, 20
 - Dishwashing liquid, 1.2 L
 - Glycerin, 600 mL
 - Plastic wrap, 1 roll
 - Ruler, metric, clear, 10
 - Straws, plastic, 30
-

PHYSICAL PROPERTIES OF SOLID MATERIALS

Materials Included in Kit *(for 10 groups of students)*

- Aluminum granules, Al, 10 g
 - Hexane, C₆H₁₄, 100 mL
 - Silicon dioxide (sand), SiO₂, 5 g
 - Sodium chloride (salt), NaCl, 5 g
 - Stearic acid, C₁₈H₃₆O₂, 5 g
 - Sucrose (sugar), C₁₂H₂₂O₁₁, 5 g
 - Aluminum evaporating dish, 100
 - Test tubes, small, 50
 - Weighing dishes, 60
-

STRUCTURES AND PROPERTIES OF POLYMERS

Materials Included in Kit *(for 10 groups of students)*

- Calcium chloride solution, CaCl_2 , 1%, 500 mL
 - Copper(II) chloride solution, CuCl_2 , 0.5 M, 500 mL
 - Sodium alginate, powder, 4 g
 - Sodium chloride solution, NaCl , saturated, 500 mL
 - Beral-type pipet, 20
 - Glue, white, 8 oz., 2 bottles
 - Petri dishes, disposable, 20
-

EARTHQUAKE-RESISTANT STRUCTURES

Materials Included in Kit *(for 10 groups of students)*

- Cardboard square, 17" × 17", 10 sheets
 - Clay, modeling, 20 sticks
 - Dowel rod, $\frac{1}{2}$ " × 12", 40
 - Sponges, 50
 - Wood blocks, 40
-

GAS PARTICLES AND WORK

Materials Included in Kit *(for 10 groups of students)*

- Calcium carbonate (marble chips) CaCO_3 , 70 g
 - Hydrochloric acid solution, 6 M, 250 mL
 - Hydrochloric acid solution, 2 M, 200 mL
 - Petroleum jelly, foilpacks, 10
 - Gas collection apparatuses, 10
 - Syringe, 60 mL
 - Syringe adapter
 - Stopper, one-hole (to fit flask)
-

THE IMPACT OF POSITION ON ENERGY

Materials Included in Kit *(for 10 groups of students)*

- Ball bearing, $\frac{3}{4}$ in., 10
 - Floral foam, 4" x 3" x 2", 10
-

PENDULUMS AND THE CONSERVATION OF ENERGY

Materials Included in Kit *(for 10 groups of students)*

- Plumb bob, 10
 - Protractor, 180°, 10
 - String, 75 g ball
-

BUILD A ROLLER COASTER

Materials Included in Kit *(for 10 groups of students)*

- Foam pipe insulation, 60 ft
 - Knife, plastic, 10
 - Marbles, glass, 10
 - Masking tape, 2 rolls
 - Sandpaper, 2 sheets
 - Steel ball, 10
-

MOMENTUM AND IMPULSE DURING COLLISIONS

Materials Included in Kit *(for 10 groups of students)*

- Balls, red, 15
-

ELASTIC AND INELASTIC COLLISIONS

Materials Included in Kit *(for 8 groups of students)*

- Happy (elastic) ball with hook, 8
 - Sad (inelastic) ball with hook, 8
 - String, thin, ball of 1/6 lb
 - Plywood blocks, 16
-

COLLISIONS AT A FAULT LINE

Materials Included in Kit *(for 10 groups of students)*

- Clay, 5 lbs., assorted colors
-

EGG SUPPLY DROP

Materials Included in Kit *(for 15 groups of students)*

- Eggs, plastic, 15
 - Paper clips, 100
 - Plastic bags, 15
 - String, ball of 1/6 lb.
 - Tissue paper, 48 sheets
 - Washer, $\frac{3}{4}$ in., 30
-

KINETIC ENERGY

Materials Included in Kit *(for 10 groups of students)*

- Food dye
 - Polystyrene cups, 16 oz., 50
 - Wax pencils, 4
-

HEAT TRANSFER

Materials Included in Kit *(for 10 groups of students)*

- Metal cylinders, 10
 - Metal shot, aluminum, 500 g
 - Metal shot, copper, 500 g
 - Polystyrene cups, 25
-

CONVECTION, CONDUCTION, AND RADIATION

Materials Included in Kit *(for 6 groups of students)*

- Conductometer, 2
 - Convection tube, 2
 - Food dye
 - Radiation cans (2 silver, 2 black)
 - Wax
-

BUILD AN EFFICIENT TRAVEL MUG

Materials Included in Kit *(for 10 groups of students)*

- Aluminum shot, 500 g
 - Copper shot, 500 g
 - Cardboard
 - Expanded polystyrene cups, 50
 - Paper cups, 30
 - Plastic cups, clear, 30
-

BUILD A BATTERY

Materials Included in Kit *(for 15 groups of students)*

- Aluminum foil, roll
 - Sodium chloride solution, saturated, 500 mL
 - Black connection wire with alligator clips, 15
 - Charcoal, 500 g
 - Chromatography paper
 - Paper clips, box of 100
 - Red connection wire with alligator clips, 15
-

ENERGY TRANSMISSION IN CIRCUITS

Materials Included in Kit *(for 8 groups of students)*

- Black connection wire with alligator clips, 40
 - Red connection wire with alligator clips, 40
 - Parallel circuit pins, 32
 - Resistor, carbon film, 1.1 k Ω , ½ watt, 15
 - Resistor, carbon film, 220 Ω , ½ watt, 15
 - Resistor, carbon film, 39 Ω , ½ watt, 15
 - Resistor, carbon film, 47 k Ω , ½ watt, 15
 - Resistor, carbon film, 620 Ω , ½ watt, 15
 - Resistor, carbon film, 8.2 k Ω , ½ watt, 15
-

ELECTRIC MOTORS AND GENERATORS

Materials Included in Kit *(for 10 groups of students)*

- Cap, plastic, 10
- Cork, size 11, 30
- DC motor (with attached plastic cap), 1.5 V, 10
- Manila folder, 5
- Masking tape, electrical, 1 roll
- Pushpins, 100

ENERGY SOURCES: COSTS AND BENEFITS

Materials Included in Kit

- Bamboo skewers, 100
- Binder clips, medium size, 4
- Cap, plastic, 2
- Cardboard bases, 4 ¼" × 5 ½", 2
- Cardboard sheets, 8 ½" × 8 ½", 8
- Cardboard tubes, 2
- Cork, size 11, 30
- Corks, size #14, 2
- DC motor, 1.5 V, 2
- DC Motors, without alligator clips, 2
- Dowel rods, wood, 4
- Foam bases, 14" × 5" × 1", 2
- Foam sheets, 8 ½" × 5 ½", 12
- Gear sets, 2
- Iron nails, 2
- LEDs, red, 4
- Magnet wire, 30 gauge, 200 feet, 2 spools
- Map pins, box of 100
- Neodymium magnet, 4
- Pipets, 6
- Sandpaper, 9 x 11", 2
- Soda bottle, 2L, cut in half, 2
- Solar car accessory bags of wheels, axles, gears, 2
- Solar mini panels, 1-V, 400 mA, 2
- Stopper, rubber, size #6, 2
- Straws, 2
- Weighing dishes, 10

MECHANICAL WAVES

Materials Included in Kit *(for 8 groups of students)*

- Nylon string, 3 ft
- String, wave motion rope, thin ball
- Spring toy, 8

INTERFERENCE OF SOUND WAVES

Materials Included in Kit *(for 8 groups of students)*

- Funnels, polypropylene, 16
 - Tubing connectors, Y-shaped, glass, 16
 - Tubing, latex, 6 m
 - Tuning fork, 426 Hz, 4
 - Tuning fork, 512 Hz, 4
-

REFLECTION AND REFRACTION

Materials Included in Kit *(for 8 groups of students)*

- Cork, 12
 - Mirror, plane, 9
 - Mirror, support, 9
 - Pin, 9
 - Semicircular lens, 9
 - Toothpick, plastic, 9
-

WAVES AND EROSION

Materials Included in Kit *(for 8 groups of students)*

- Clay, 2 lb
 - Gravel, 2 lb
 - Paint tray liner, 8
 - Pipe cleaners, chenille wires, 100
 - Sand, 1000 g
 - Toothpicks, 750/package, 2
-

DIFFRACTION

Materials Included in Kit *(for 6 groups of students)*

- Binder clips, $\frac{3}{4}$ ", 6
 - Binder clips, medium, 6
 - Fishing line, monofilament, 65 ft
 - Index card, 3" x 5", 15
 - Laser pointer, 2 in 1, 6
 - Magnet wire, 30 gauge, 200 ft
-

PARTICLE NATURE OF LIGHT

Materials Included in Kit *(for 6 groups of students)*

- Cuvettes, 1/2", 6
 - Phosphorescent strip, 10 1/2" x 1"
 - Photon demonstrator card, 6
-

ELECTROMAGNETIC RADIATION AND MATTER

Materials Included in Kit *(for 6 groups of students)*

- Electroscope, 6
 - Rubber rod, 6
 - Sandpaper, 9" x 11"
 - Wool, 6" x 6", 6
 - Zinc foil, 3" x 3", 6
-

SOLAR PANEL ART

Materials Included in Kit *(for 8 groups of students)*

- Solar mini panel, 1 V, 400 mA, 8
 - Color filters, paddles, pkg 6, 8
-

BINARY LOGIC

Materials Included in Kit *(for 10 groups of students)*

- Breadboards, 10
 - Switches, 20
 - Clear LED, red, 10
 - Resistors, 100 Ω , 10
 - Battery holders, D, single, 10
 - PVC-insulated wire, 100 ft
-

CONVERTING ELECTRICAL SIGNALS TO SOUND

Materials Included in Kit *(for 8 groups of students)*

- Alligator clips, 16
 - Cups, plastic, 50
 - Headphone-jack plug, 8
 - Magnet wire, 4 oz
 - Magnets, neodymium, 16
 - Radio (to be shared by class)
 - Sandpaper, 9 in x 11 in
 - Speaker wire, 22 AWG, 10 ft
-

CONVERTING SUNLIGHT TO ELECTRICITY

Materials Included in Kit *(for 8 groups of students)*

- Cardboard sheet, 4¼ in x 5½ ", 8
 - DC Motors, 8
 - Solar car bags of wheels, axles, and gears. 8
 - Solar mini panels, 1V, 400 mA, 8
 - Straws, 8
-

ROVER

Materials Included in Kit *(for 10 groups of students to share)*

- Rover 2.0 Kits, 2
-

SUBATOMIC PARTICLES

Materials Included in Kit *(for 10 groups of students)*

- Foam Counters, pkg/10, 10
 - Marbles, magnetic, blue, 20
 - Marbles, magnetic, red, 20
-

FORCES AND ATOMIC NUCLEI

Materials Included in Kit *(for 10 groups of students)*

- Marbles, glass, 16 mm, 30
 - Rubber bands #33, 110
 - Compression springs, 12
-

NUCLEAR REACTIONS AND CRITICAL MASS

Materials Included in Kit *(for 10 groups of students)*

- Dice, 6-sided, pkg/10, 20
-

ENERGY PRODUCTION

Materials Included in Kit *(for 10 groups of students)*

- Aluminum foil, roll
 - Charcoal, 90 g
-

HALF-LIFE SIMULATION

Materials Included in Kit *(for 10 groups of students)*

- 4-sided die, 20
 - 6-sided die, 180
 - 8-sided die, 20
 - 10-sided die, 20
 - 12-sided die, 20
 - 20-sided die, 20
 - Plastic nickels, 200
-

RADIOMETRIC DATING OF ROCKS

Materials Included in Kit *(for 10 groups of students)*

- Bingo chips, green, 250
 - Bingo chips, red, 250
 - Bingo chips, yellow, 250
 - Culture dish, 20
-

PLATE TECTONICS AND SEAFLOOR SPREADING

Materials Included in Kit *(for 10 groups of students)*

- Basalt, 30
 - Granite, 30
 - Pangea continental plate, 10
 - Ocean base, 10
 - Ocean crust, purple, 10
 - Ocean crust, red, 10
 - Ocean crust, yellow, 10
-

BUILD A GLOVE BOX

Materials Included in Kit *(for 6 groups of students)*

- Acrylic sheet, 17.8 cm × 17.8 cm × 0.3 cm, 30
 - Acrylic sheet with two holes, 17.8 cm × 17.8 cm × 0.3 cm, 6
 - Balloons, 30.5 cm, pkg 20
-

SUNLIGHT INTENSITY AND SOLAR FLARES

Materials Included in Kit *(for 8 groups of students)*

- Solar mini panels, 1 V, 400 mA, 8
-

ELEMENTAL COMPOSITION OF STARS

Materials Included in Kit *(for 15 groups of students)*

- Copper(II) chloride, 50 g
 - Lithium chloride, 50 g
 - Sodium chloride, 50 g
 - Strontium chloride, 50 g
 - Wood splints, 100
 - Rainbow glasses, 15
-

THE EXPANSION OF THE UNIVERSE

Materials Included in Kit *(for 10 groups of students)*

- Balloon, round, 20
 - Clothespin, wooden, 25
 - Tape measure, metric, 10
-

THE COLORS OF LIGHT

Materials Included in Kit *(for 10 groups of students)*

- Flinn C-Spectra™ (holographic diffraction grating), 2" × 4" square
 - Cardboard tube, 10
 - Electrical tape, black, 1 roll
 - Construction paper, black, 9" × 12" sheet, 2
-