

Multiple Units

Per Group

Access to computer with internet connection, Java-enabled browser, and ability to play YouTube movies.

Colored pencils

Meter stick

Large whiteboard

Dry-erase markers and eraser

Unit M

Per Class

- Cutters (demagnetized, and able to cut small finishing nails)
- Hammer and small block of wood

Per Group

- Mystery tube (see instructions on how to construct)
- (Optional) Materials for students to construct their own mystery tube
- 2 disk magnets
- 1 bar magnet
- Set of different materials for testing
- Several unmagnetized nails
- Small float
- Aluminum pie tin or deep Styrofoam plate
- Container for collecting and pouring water (or easy access to faucet/sink)
- Masking (or other) tape
- Magnetic compass
- Paper clips or other convenient light ferromagnetic objects
- Test tube partially filled with iron filings and taped shut

Extras for engineering design activity

- Small wood or plastic box (length should be 12+ inches, height and width a few inches)
- Flexible magnetic strips (polarized so one surface is all N and the other surface is all S)
- Large sheet of stiff card or foam-core board
- Double sided sticky tape.

Unit SE

Per Group

- Roll of sticky tape ('Magic' tape works well)
- Pen, or other permanent marker
- Support stand from which to hang tape. (This could be a meter stick projecting beyond the edge of a table.)
- Various materials to test
- Balloon (x2)
- Small pieces of aluminum foil and paper ('hole punch' size or smaller)

Unit EM

Per Class

- (Optional) Solar cell connected to some working device

Per Group

- Low-friction cart and track
- Friction pad attachment for cart, or separate friction-cart
- Motion Sensor connected to a computer and appropriate software
- Small block of wood
- Dry cell battery (D) and holder
- Genecon (or one for demos)
- Small bulb and holder
- Switch
- Hookup wires
- (Optional) Buzzer and Motor/Fan

Extras for engineering design activity

- (Optional) Light and dark colored waterproof containers and bright light bulb (or access to sunlight)

Unit PEF

Per Group

- Low-friction cart (x2 or share between groups) and track
- Cart launcher, clamp, and rubber bands
- Additional masses to add to carts

- Motion Sensor connected to a computer and appropriate software
- 2 disk magnets
- 1 bar magnet
- Set of different materials for testing
- Roll of sticky tape ('Magic' tape works well)
- Pen, or other permanent marker
- Support stand from which to hang tape. (This could be a meter stick projecting beyond the edge of a table.)
- Small sticky pads (fixing squares) or tape.
- Dry cell battery (D) and holder
- Genecon (or one for demos)
- Small bulb and holder
- Switch
- Hookup wires
- Electric motor kit (Battery and holder, straightened clips, coil of wire with ends sticking out, small (strong) magnet)

Extras for engineering design activity

- Genecon hand generator (per group), 1 F capacitor

Unit FM

Per Group

- Low-friction cart and track
- Friction pad attachment for cart, or separate friction-cart
- (Optional) Force sensor and instructions for set up and use
- Additional masses to add to cart
- Motion Sensor connected to a computer and appropriate software
- Fan unit with variable power, or with spare batteries and dummies (as needed)
- Launcher, clamp, and rubber bands
- Small block of wood
- 2 sheets of sandpaper
- Pad of 'sticky notes'
- Magnifying lens
- Ruler

- Two objects with very different masses (e.g. a 1 kg and a 100 g mass)
- Several objects with different masses (but similar size and shape)
- Hard board such as a whiteboard (to drop balls onto)

Extras for engineering design activity

- (Optional) Various cushioning materials and container (eg. plastic bag) to attach to cart

Unit CF

Per Class

- Low friction cart and track
- Two fan units with equal power

Per Group

- Low-friction cart (x2 or share with other groups) and track
- Friction pad attachment for cart, or separate friction-cart
- Fan unit
- Additional masses to add to cart
- Motion Sensor connected to a computer and appropriate software
- (Optional) 2 x Force sensors and instructions for set up and use
- (Optional) 2 x Force plates and instructions for set up and use
- Small block

Extras for engineering design activity

- Scissors
- Paperclips

Unit WS

Per Class

- Wave generator and loudspeaker or access to on-line tone generator (needs to span human hearing range)
- (Optional) Bell in vacuum jar and pump (movie available)

Per Group

- Small slinky with block attached
- Larger slinky
- 12-inch ruler
- (Optional) Tuning fork and 'mallet' (could be shared)
- Large board, (such as whiteboard)
- Sheet of paper

Unit L

Per Class

- Black sheet of paper with mirror and white card inset.

Per Group

- 2 Mini- Maglite™ flashlights (or similar with narrow beam)
- Black card with pinhole
- Small black card (no hole)
- White screen
- Stands for cards and screen (could be clay and a nail)
- Tubular bulb in socket
- Ruler or straight edge (one per student)
- Plane mirror
- Plastic or Styrofoam cup
- Pencil
- Color gels (Red, Green, Blue, Cyan, Magenta, Yellow)
- Spectral glasses (one pair per student)
- White card
- Red card

Extras for engineering design activity

- 3 square plane mirrors (at least 3" x 3")
- Tape (to hold mirrors together)
- Flashlight with 'slit collimator'
- Protractor

Unit PCPer Group

- calcium chloride
- Urea
- bowling balls (10 lb, 12 lb)
- 10-20 mL water
- beakers (50, 100, 250, 400, 600 mL)
- 100 mL Grad Cylinder
- flasks (125, 250 mL)
- stoppers to fit flasks (0-, 1- and 2-holed)
- 2 L plastic bottle
- Empty aluminum soda cans
- small dixie cups
- teaspoons
- Sodium acetate trihydrate
- 60 mL syringe

- ice
- Alcohol Thermometer
- baking soda
- Electronic balance (accurate to 0.01g)
- Balloons
- bathroom scale
- Beaker tongs or oven mitts
- Density Blocks with same dimensions AND Blocks of the same mass made of different materials
- bowl
- brass ring and ball set
- buret
- charged rod
- Clamp and ring stand
- Clear plastic bin big enough to submerge a bowling ball in water
- Data Collection Device
- Probes: Temperature and Pressure
- Dish pan
- Distilled water
- ethanol
- hexane
- filter funnel
- filter paper
- Fine castor sugar
- food dye
- glass stir rod
- Graph paper
- handwarmers ready to activity
- Hot plate
- IR thermometer
- knox powdered gelatin
- laser pointer
- Lime (Ca(OH)_2)
- magnet
- marker
- oven mitt or tongs
- Rulers
- salt
- sugar
- tack or nail to puncture
- Tape
- timer
- torch
- tubing and fitting connectors

- tubing and fitting connectors
- valve fitting
- Watch glasses
- wax paper

Unit CR

Per Group

- 1 M HCl
- Alka Seltzer
- bare copper electrodes
- gallon size zippered plastic bags
- sets of wires with alligator clips on both ends
- well plates
- Beakers (50, 100, 250, 400 mL)
- 250 mL Flask
- stoppers to fit flasks (no hole, 1-hole and 2-hole)
- watch glasses
- 4 oz Dixie(tm) cup
- 9 volt battery
- balloons
- beral pipet or eye dropper
- bunsen burner
- Carbon (graphite or coal)
- clear plastic cup
- Cloth
- colorless ammonia solution
- conductivity tester
- Disposable Hand warmers, HotHands™
- Distilled water
- dry ice
- electronic balance (accurate to 0.01 g)
- Epsom salt
- Forceps
- Fume hood
- glass stirring rod
- Hammer
- hot plate
- hydrogen gas
- Iodine solid
- ice

- Iron fillings
- iron wire
- magnesium ribbon
- magnet
- magnifying glass
- meter stick with candle
- Molecular model kit
- mortar and pestle
- ammonium chloride
- oxygen gas
- Play dough
- Powderd Zinc
- powdered Sulfur
- scissors
- silicon
- small hammer
- strontium hydroxide octahydrate
- starch solution
- stirring rod
- teaspoon
- Test tube
- test tube clamp
- Thermometer
- tin
- vinegar
- watch glass
- weigh paper or weigh boat
- wooden block (about 4in.x4in x 1 in)
- zinc (mossy and powdered)
- Zn powder
- zinc chloride