

Materials List

Chapter 1: Vacuuming Leaves

$\frac{1}{4}$ tsp (1.5 g) baking soda

Liquid dish soap

*Plastic syringe w/out needle (20+ mL)

Spoon for stirring

Handful of spinach or ivy leaves

Hole punch

1 large drinking glass

2 small clear cups/drinking glasses

Timer or clock with second hand

Lamp

*Large syringes can be found in most medical, veterinary, or farm/ranch supply stores

Chapter 2: EcoColumn - A ten-week journey

X-acto knife or boxcutter

Hammer and a medium-sized nail

Rubber band

Permanent marker

Measuring tape and cup

Needle or paper clip

3 clear 2 liter soda bottles and caps

~3 cups of aquarium gravel or small rocks

5-6 cups of potting soil (organic or untreated)

Dead organic matter such as leaves, small sticks, dead bark

Small aquatic plants from pet store (elodea, hornwort, etc.)

2-5 red wiggler worms, earthworms, and/or pill bugs

Seeds of small plants (radish, alyssum, or nasturtium seeds work great)

Large pitcher or bucket

Aquarium nutrient test strips and thermometer (optional)

Chapter 3: Conservation of (Balloon) Energy

Small plastic bottle or milk/juice carton

Rubber band

Balloon

Two drinking straws with flexible end

One bamboo skewer

Four old CD's or paper-sized sheet of corrugated cardboard

Heavy duty scissors

Duct tape

Chapter 4: Convection Carousel

Three tea light candles

Two aluminum cans

Small amount of clay

Safety gloves

One small nail or screw

Metal shears or heavy duty scissors

Chapter 5: Homemade generator

30 gauge magnet wire (Radio Shack Model: 278-1345 -"315-ft. Magnet Wire Set")

1.5V/25mA miniature lamp (Radio Shack Model: 272-1139) or small LED

One drinking straw

One 3+ inch long nail (8+cm)

Film canister or empty medicine bottle

Four 8mm neodymium disk magnets (Hobby Lobby sku# 179747)

$\frac{1}{2}$ square inch (13mm) foam or sponge

Knife or box cutter

Drill and bit with a smaller diameter than the drinking straw

Chapter 6: Time-scale metaphor for geologic time

Calculator (optional)

Chapter 7: Tectonic Fingernails

Metal file

Metric ruler

Camera (optional)

Chapter 8: Igneous Rock Formation

Aluminum pie pan

Candle

Saltwater solution

Teaspoon

Measuring cup or saucepan

Eyedropper or drinking straw

Drinking glass

Magnifying glass

Chapter 9: Earthquake-proof buildings

For the shake table:

Large wooden or plastic storage container

Several rubber bands

Twelve (12) metal binder clips

15-30cm (~6-12in) piece of wood (can be adjusted according to the storage container size)

8 screws or nails

*If wood cannot be used, you can glue several sheets of cardboard together to make a sturdy platform. Fasten paperclips within the layers instead of screws/nails.

For the buildings:

12 pieces of full length spaghetti

1.5 pieces of lasagna noodles

White/construction glue or cold/hot melt glue gun

* If safety is a concern, consider using low melt temperature glues.

Four (4) gumdrops or lumps of clay

Ten (10) 3/8 inch flat washers or similarly-sized coins

Ruler

Chapter 10: Mechanical Weathering of Plaster

Three large paper, plastic, or styrofoam cups

Plaster of Paris

Mixing container for plaster

Stick, old spoon, or paint stirring rod

Two small balloons

Freezer

Plastic/wooden tray

Two 12in (~30cm) pieces of string

Chapter 11: Water Currents Under Our Feet

Four (4) 2L plastic bottles

Two drinking straws

Modeling clay or hot/cold glue

Measuring cups

Timer/stopwatch

Sharp knife

Ruler

Paper and pencil

Pea gravel/aquarium gravel, sand, clay/soil, or any mixture of these substances (enough to fill all of the bottles)

Chapter 12: Supercooled Water Drops

Cereal or salad bowl

Clear plastic wrap

Eye dropper or drinking straw

Distilled water

Freezer

Timer

Chapter 13: Coriolis Fountain

One 2L bottle

Dowel rod - at least 20in (50cm) long and 1/4 in (6mm) in diameter

3-4 feet (cm) vinyl tubing 1/4" or 3/8 " outside diameter

Two large binder clips (or tape)

Rubber cement or hot glue

Drill bit or large nail

~3ft (~1m) string

Chapter 14: Melting "Icebergs"

Baby oil

Ice cubes

Vegetable oil

Food coloring

Clear drinking glass

Chapter 15: Modeling the Albedo Effect

*1-8 empty soda/water bottles (500mL will work fine)

*1-8 thermometers (<http://www.teachersource.com> Item #TEM-100)

Clear packing tape

White paint

Three cups of soil (garden or potting soil)

Three cups of white sand or perlite

Knife

Lamp with ~150-watt floodlight bulb (optional)

Graph paper

*This experiment can be run with a single soda bottle and thermometer; however, it will may require several hours to complete

Chapter 16: DIY Swamp Coolers

Table or box fan
Cardboard box with lid (large enough to contain the fan)
Paper towels
Glue/staples
Tape
Thermometer
Box cutter or knife
Spray bottle with water

Chapter 17: Hero's Fountain

Three 16.9oz (500mL) water or soda bottles
~ 60cm (~24in) aquarium tubing
Small lump of clay or hot/low temp glue
Drill and bit slightly smaller than the tubing diameter
Scissors

Chapter 18: Bread Pan Convection

Metal or glass bread pan
Aluminum foil
X-acto, or other sharp knife
Candle
Two aluminum cans
Duct tape
One sheet of paper or incense sticks
Marker
Lighter or matches
Container of water or fire extinguisher (just in case)
Flashlight (optional)

Chapter 19: Paper Tube Astronomy

Toilet paper roll
Two paper clips
Two long nails
Hammer
Tape
Stopwatch

Chapter 20: Dendrochronology 101

Metric ruler
Data sheet and Tree ring column data (provided)

Chapter 21: Deer to my Heart

Activity data sheet and food chip cut outs (see attached)

Chapter 22: Heterotrophic Side Dish

2.5 lbs (1.1kg) chinese (napa) cabbage
1/2 cup pickling salt
1 tsp grated ginger
4-5 cloves crushed garlic
1 small bunch minced green onions/scallions
2 tbs sugar
2 tbs crushed red pepper
2 finely minced jalapeños
Two glass or plastic bowls
2-3 glass mason jars with lids (pint sized)
Colander
Gloves
Spoon
pH paper (must identify a pH range at least between 3-6)

Chapter 23: Soil Respiration and the Carbon cycle

4 clear plastic water or soda bottles (~20oz works fine)

Goggles and gloves

Duct tape

Scissors

Dried soil (top soil or compost) - enough to fill 2-4 all of the bottles

One gallon of distilled or boiled tap water

1 tsp sugar

Two 2-foot sections of vinyl or rubber tubing

Rubber cement

Aluminum foil

Flat baking dish

Pickling lime (in the canning section of most grocery stores) or slaked lime (found in garden supply stores)

2-3 glass jars with lids (quart or smaller sizes work well)

Coffee filter paper

pH paper (optional)

Perlite (optional)

Rapitest Soil Tester kit for nitrogen, phosphorus, potassium (optional)

Chapter 24: Winogradsky column

2L plastic soda bottle

5 cups (~1.2L) mud/sand from a forest, garden, lake, pond, marsh, or ocean

5 cups (~1.2L) water from the same mud/sand location

Small bucket

Measuring cup and spoons

Large spoon

Sheet of newspaper

One piece of chalk

Hard boiled egg yolk

Plastic wrap

Rubber band

Ruler or measuring tape

Small pencil sharpener

Chapter 25: Calculating the Air We Breathe

Test tube*

Fine steel wool (with no soap added)

Pencil

Water

Small drinking glass

Ruler

Marker

** Any clear plastic or glass item resembling a test tube will work for this experiment. Search through candy aisles or craft stores for anything similar in design.*

Chapter 26: Calculating Your Ecological Footprint

Ecological footprint calculation sheet (see attached)

Calculator (optional)

Chapter 27: Archimedes' screw

Two feet (0.6m) PVC pipe, $\frac{1}{2}$ -inch (1.25cm) inner diameter

10 feet (3m) clear vinyl tubing with $\frac{3}{8}$ -inch outer x $\frac{1}{4}$ -inch inner diameter

Duct tape

Scissors

Two large bowls or buckets

Chapter 28: Gurgle Gardens

5gal (18.9L) bucket with lid

2.5gal (9.45L) bucket

Single outlet aquarium air pump

Two 36in (91.4cm) sections of aquarium tubing

One "T" fitting for aquarium tubing

Electrical tape

Drill with $\frac{1}{4}$ - $\frac{1}{2}$ in (6.4-12.8mm) bit

Binding clap

Perlite, rinsed gravel, grow rocks, or wood chips

Various plants

Chapter 29: Modeling Coral Bleaching

2L of root beer, strong coffee, or any other dark-colored fluid
Two empty 2L bottles
Two small water bottles (must be able to fit within the 2L bottles)
Gravel and potting soil (enough to fill both small bottles)
Fast growing grass seed
Scissors
Pitcher or large bowl
Cotton balls
2-3 pipe cleaners

Chapter 30: Simulating Algae Growth

10 small glass or plastic identical cups or jars
Pond water
Detergent containing phosphates
Fertilizer in liquidform
Distilled water
Eye dropper
Measuring spoons