

## APPENDIX C

## COMPLETE LIST OF LAB SUPPLIES

Note: Items in **boldface blue type** are found in the laboratory equipment set that is available through Apologia. The other materials are available at grocery stores, hardware stores, or drug stores.

**MODULE 1**

- **Safety goggles**
- Meterstick (A yardstick will work as well.)
- 2 eight-inch or larger balloons
- 2 pieces of string long enough to tie the balloons to the meterstick
- Tape
- Tall glass
- Paper towel
- Sink full of water
- Book (not oversized)
- Metric and English rulers

**MODULE 2**

- **Safety goggles**
- **100 mL beaker** (A small juice glass can be used instead.)
- **250 mL beaker** (A large juice glass can be used instead.)
- **Watch glass** (A small saucer can be used instead. It must cover the mouth of the 100 mL beaker or juice glass listed above.)
- Teaspoon
- Lye (This is commonly sold with the drain cleaners in hardware stores and supermarkets. Make sure that your bottle is labeled 100% lye or something similar. If you cannot find lye, you can order it online. It may be listed under its chemical name, sodium hydroxide. *Always use this chemical in a well-ventilated area.*)
- White vinegar
- Several leaves of red (often called purple) cabbage

- Water
- Small pot for boiling water
- Measuring cup
- Heat source such as a stove or alcohol burner
- **Mass scale**
- **Stirring rod** (A spoon will work.)
- Rubber cleaning gloves
- Distilled water (Half a gallon is plenty.)
- Baking soda
- Sugar
- 9-volt battery (*Do not use an electrical outlet in place of the battery. The electrical energy in a wall socket will hurt you and can kill you!*)
- 2 pieces of wire (preferably insulated), each of which is at least 15 cm long
- Scissors or wire cutters to strip insulation from wire (if it is insulated)
- Tape (preferably black electrical tape)
- ½ teaspoon
- Sand (Kitty litter is an acceptable substitute, but don't use the kind that clumps.)
- Table salt
- **Funnel**
- **Filter paper** (You can cut a circle out of the bottom of a coffee-maker filter.)

### MODULE 3

- **Safety goggles**
- Comb
- Aluminum foil
- Cellophane (Scotch) tape
- 2 plain white sheets of paper (There cannot be lines on them.)
- Bright red marker (A crayon will also work, but a marker is better.)

### MODULE 4

*There are no experiments in this module.*

### MODULE 5

- **Safety goggles**
- Glass of water
- Vegetable oil
- Styrofoam or paper cup
- Comb
- Pen
- **2 test tubes** (Thin glasses will work, but they must be transparent.)
- Table salt
- Water

## MODULE 6

- Safety goggles
- Plastic graduated cylinder (A rain gauge will work as well. A measuring cup may work, but if you have a frost-free freezer, the opening of whatever you use should be very small.)
- Egg in its shell
- Toilet bowl cleaner (The list of ingredients must include hydrochloric acid or hydrogen chloride. The Works was the brand used when this experiment was tested. You can use vinegar if you cannot find a proper toilet bowl cleaner, but the experiment will have to sit overnight in order for it to work. However, if you do use vinegar, the egg will be much more interesting to observe!)
- Tall glass
- Sink
- Spoon
- Rubber cleaning gloves
- Empty milk jug
- Water
- Small pot
- Stove
- Hot pads
- 2 glass canning jars or peanut butter jars, both the same size
- Food coloring (any color)
- Vegetable oil
- Graduated cylinder or measuring cups
- Maple syrup (Natural syrup does not work as well as something like Mrs. Butterworth's.)
- Large glass
- Mass scale

## MODULE 7

- Safety goggles
- Eyedropper
- Stirring rod (or spoon)
- Water
- Large glass (at least 16 ounces)
- Graduated cylinder (Measuring cups and measuring spoons can be used, but they will be less precise.)
- Dishwashing liquid (It must be the kind used for washing dishes by hand, *not* the kind used in automatic dishwashers. Preferably, the brand should be Joy or Sunlight.)
- Large bowl (It should have a diameter larger than 10 inches but smaller than 12 inches. If you don't have a bowl in that size range, then use one larger than 12 inches; it will just make it a little harder to use the ruler.)
- Pepper
- Ruler

**MODULE 8**

- Safety goggles
- Baking soda
- Vinegar
- String or tape measure
- **Graduated cylinder** (or measuring cups and spoons)
- Ruler
- Round balloon
- Plastic 2-liter bottle (or other large bottle)
- **Mass scale**
- **Funnel** or butter knife (Read the experiment to see what is meant.)

**MODULE 9**

- Safety goggles
- **Red litmus paper**
- **Blue litmus paper**
- Apple
- Orange juice or soda pop
- Toilet bowl cleaner (Both The Works and Lime-Away have been tested, but any toilet bowl cleaner designed to combat lime should work.)
- Bar soap (Make sure it isn't labeled "pH balanced.")
- All-purpose cleaner (Windex and 409 have been tested, but any spray cleaner not specifically designed for toilets should work.)
- Powdered drain cleaner (like Red Devil Lye) or scouring powder (like Comet)
- **4 test tubes** (Small cups will work.)
- **Watch glass** (A small saucer will work.)
- **Stirring rod** (or spoon)
- Rubber gloves (Wear gloves whenever you use powdered drain cleaners and toilet bowl cleaners because these chemicals are caustic.)
- **Eyedropper**
- **Mass scale**
- Distilled water (available at any grocery store)
- Sheet of unlined white paper
- A few leaves of red cabbage (It must be red cabbage, not regular cabbage.)
- **2 beakers** (If you don't have beakers, use a short, fat glass that is transparent and a small pot to boil water in.)
- **Alcohol burner** or stove for heating
- **Graduated cylinder** (Measuring cups and spoons will work, but the experiment will be much harder.)
- Clear ammonia solution (This is sold with the cleaning supplies in most supermarkets. It must be clear. A colored solution will mess up the endpoint.)
- Clear vinegar (Once again, colored vinegar will mess up the endpoint.)

**MODULE 10**

- Safety goggles
- 250 mL beaker (A short, fat glass or canning jar might work, but be careful. *Glasses tend to crack when subjected to the temperature extremes of experiment 10.1.* If you don't have a beaker, you may want to just read this experiment, unless you aren't afraid of losing a glass or 2.)
- 100 mL beaker (Another short, fat glass or canning jar might work.)
- Graduated cylinder (A  $\frac{1}{4}$  measuring cup will work.)
- Alcohol burner or stove for heating
- Stirring rod (A spoon will work.)
- Thermometer
- Mass scale
- Table salt
- Filter paper (You can cut a circle out of the bottom of a coffee filter.)
- Funnel
- Oven mitt
- 2 beakers (Two saucepans will work.)
- Test tube (A tall, thin glass will work, but it must fit easily in the saucepans.)
- Ice
- Cold soda pop (Pepsi, Coke, Sprite, etc. It must be carbonated.)
- Lye (This is commonly sold with the drain cleaners in hardware stores and supermarkets. Make sure that your bottle is labeled 100% lye or something similar. If you cannot find lye, you can order it online. It may be listed under its chemical name, sodium hydroxide. *Always use this chemical in a well-ventilated area.*)
- Rubber gloves
- Water
- Sink
- Tablespoon
- $\frac{1}{4}$  measuring teaspoon

**MODULE 11**

- Safety goggles
- Kitchen sink or large bucket
- Towels or napkins
- Graduated cylinder
- Butane lighter (A cigarette lighter with a clear case will work best.)
- Mass scale
- Thermometer
- Weather report that contains the atmospheric (sometimes called barometric) pressure for the day
- Plastic 2-liter bottle
- Round balloon with an 8-inch diameter
- Vinegar
- Baking soda
- Seamstress's tape measure (A piece of string and a ruler will work as well.)

**MODULE 12**

- Safety goggles
- Thermometer
- 250 mL beaker (A small glass container will do, but make sure it is safe for boiling water.)
- Water (preferably distilled water, which can be purchased at any supermarket)
- Ice (preferably crushed)
- Graph paper or computer with spreadsheet program
- Alcohol burner or stove for heating
- Mass scale
- 2 Styrofoam cups
- A chunk of metal that has mass of at least 30 grams (a lead sinker or a very large steel nut, for example)
- Boiling water (either in a pot or a beaker)
- Kitchen tongs

**MODULE 13**

- Safety goggles
- 2 Styrofoam coffee cups
- Thermometer
- Vinegar
- Mass scale
- Measuring tablespoon and ½ teaspoon
- Lye (This is commonly sold with the drain cleaners in hardware stores and supermarkets. Make sure that your bottle is labeled 100% lye or something similar. If you cannot find lye, you can order it online. It may be listed under its chemical name, sodium hydroxide. *Always use this chemical in a well-ventilated area.*)

**MODULE 14**

- Safety goggles
- Liquid toilet bowl cleaner (The Works was used when this experiment was tested, but any liquid that contains hydrochloric acid or hydrogen chloride should work. Stay away from the thickened toilet bowl cleaners that cling, however.)
- Antacid tablets (TUMS works best. In principle, any antacid tablet that has calcium carbonate as its main ingredient should work.)
- Sharp, non-serrated knife
- Spoon
- Stirring rod (Something thin enough to stir the contents of the test tubes.)
- 4 test tubes (Small glass containers will work.)
- Alcohol burner or stove for heating
- Large beaker (A short, fat glass will work.)
- Small beaker (A short, fat glass will work. If you are not using test tubes, make sure that one of your glass containers fits into this.)
- Rubber gloves

- **Watch glass** (A small saucer that covers the beaker will do.)
- **Graduated cylinder** (A  $\frac{1}{8}$  measuring cup will work.)
- $\frac{1}{4}$  measuring teaspoon
- Hydrogen peroxide (available at supermarkets and drug stores)
- Baker's yeast (Any kind of bread yeast, even bread machine yeast, will do.)

## MODULE 15

- **Safety goggles**
- 3 plastic 2-liter bottles (Plastic milk cartons will work as well.)
- 4 small cups
- 2 bowls that are taller than the small cups
- Serrated knife (like a steak knife)
- Small Phillips-head screwdriver
- Water
- Person to help you
- Kitchen counter
- Towels
- **2 test tubes**
- **2 eyedroppers**
- **2 beakers**
- 2 small cups
- Clear ammonia solution (This is sold with the cleaning supplies in most supermarkets. It must be clear. A colored solution will mess up the colors you are supposed to see.)
- White vinegar (It must be white. Colored vinegar will mess up the colors you are supposed to see.)
- **Alcohol burner** or stove for heating
- Pot for boiling water on the stove
- Ice (preferably crushed)
- A few leaves of red cabbage (It must be red cabbage, not regular cabbage.)

## MODULE 16

- **Safety goggles**
- Large bowl
- Blank notebook paper without lines
- Scissors
- Cotton swab or small paintbrush
- Lemon juice (This must be *real* lemon juice, either fresh or from concentrate.)
- Iodine solution (This is available in large drugstores. The pharmacy department within your supermarket will probably not have this, and neither will a small corner drugstore. A major chain will have it, however. Please note that *iodide* will not work. Iodide, as you should know, is  $I^-$ , while iodine is  $I_2$ .)
- Water
- Measuring cups

- **Medicine dropper**
- **Stirring rod** (A **plastic** spoon or knife will work as well. Do not use any flatware around the iodine solution, as iodine will rust metal.)
- 4 juicy lemons
- 4 copper pennies (Pennies from before 1982 have higher copper content. You can also use copper wire instead of a penny.)
- 4 two-inch zinc coated (galvanized) nails
- 5 small wires, ideally with alligator clips
- Volt meter (optional)
- LED (Light Emitting Diode) bulb