

Appendix B

Experiment Supplies Needed for Each Chapter

Chapter 1:

- Some plain (not peanut) M&M candies (You need at least 12 candies.)
- Water
- Vegetable oil
- Two small glasses, like juice glasses
- A fork
- A notebook in which you can keep a record of all your experiments
- A pen or pencil with which to write

Chapter 2:

- Honey
- Water
- Vegetable oil
- An ice cube
- A balloon
- A grape (optional)
- An aluminum can (like the kind soda comes in)
- Clean, dry hair or a wool sweater or blanket
- A tall, clear glass
- A coin (like a penny)
- A wooden match
- A ball (It can be as small as a golf ball or as large as a baseball.)
- A plastic bag that can hold the ball but still have extra room.
- A 50-cm (20-inch) length of string that is strong enough to hold several times the weight of the ball that you have chosen.

Chapter 3:

- Baking soda
- Table salt
- Vinegar
- Water
- Table salt
- Two marshmallows (regular size, not mini)
- A small jar you can see through (It needs to be able to hold the marshmallow with room to spare.)
- Two bowls of the same size (They should each hold just a few cups of liquid.)
- A candle
- Something to light the candle
- 10 nickels
- 10 pennies (If you use different currency, just choose two types of coins that are close in value.)
- A measuring teaspoon
- A ½-cup measuring cup
- Play-Doh (or similar clay)

- A funnel
- A wall mirror
- A microwave oven
- A napkin or paper towel
- A dinner plate
- A clear plastic cup
- Two metal thumbtacks (They must be plated with nickel. Sometimes the box says that, but as long as they are metal and look silvery, they should be nickel-plated.)
- A 9-volt battery

Chapter 4:

- Sugar
- Table Salt
- Baking soda
- Water
- Olive oil (Vegetable oil can be used, but the results might not be as good.)
- Four small glasses, like juice glasses.
- A candle that can stand on its own or is in a candle holder (The wick should stand about as tall as the juice glasses)
- Something you can use to light the candle
- Aluminum foil (heavy duty works best)
- A counter top that is not flammable and is clear of anything flammable
- A small amount of wax (about the size of a small pea – you can cut it from a candle if you want)
- Two small plates that are not made of paper.
- A freezer with enough room to set the two plates or bowls on a level surface
- Two pennies
- Two medicine droppers
- Two pill bottles, the smaller the better (You need two small, cylindrical containers with hard sides. If you don't have pill bottles, you might try to find film canisters or something like that.)
- A sink
- Paper towels

Chapter 5:

- Three 1-quart Ziploc bags (They need to be new ones so that the zipper forms an airtight seal.)
- A measuring tablespoon
- A measuring teaspoon
- A ¼-cup measuring cup
- A ¼-teaspoon measuring spoon
- Three small glasses, like juice glasses
- A pan for heating water that is large enough to hold two of those glasses standing up
- Two plastic spoons (or something else that is not metal and can be used to stir)
- Baker's yeast (any kind of active, dry yeast)
- Sugar
- Salt
- Flour (any kind)

- Warm (not hot) water
- A marker that writes on plastic
- Butter (half a stick)
- Vegetable oil
- Iodine (It is available at any drug store or large grocery store. It is used as an antiseptic to treat wounds. You will often see the word “tincture” in the name, such as “Tincture of Iodine.”)
- Corn syrup (If you don’t have that, a fruit juice will work.)
- An egg
- White vinegar
- Rubbing alcohol
- Two clean pencils that are unsharpened
- Cellophane tape
- A candle that stands on its own (The smaller the flame it makes, the better)
- Something to light the candle
- A dim room

Chapter 6:

- Two slices of bread (White works best, because you are looking for colored water in the bread.)
- Food coloring (Choose the color that will show up best when it is in the bread.)
- A soup bowl
- Water
- A spoon
- A plate
- A sharp knife
- Red (some people call it “purple”) cabbage
- Distilled water (You can get this at any grocery store. Be sure it says “distilled.” Half a gallon should be plenty.)
- A pan for boiling (Ideally, it would have a spout from which you can pour.)
- A sink
- A straw
- A white paper towel or blank sheet of white paper
- A Ziploc bag that has not been used before
- Iodine (You used it in a previous experiment)
- Two small glasses, like juice glasses
- Starch (Most people have cornstarch for cooking, but any kind of starch will work)
- A measuring $\frac{1}{2}$ teaspoon
- A measuring teaspoon
- A $\frac{1}{2}$ -cup measuring cup
- Paper towels
- Two dinner plates that are not made of paper
- A cup

Chapter 7:

- Sugar
- One package of unflavored gelatin
- Beef bouillon

- Water
- A pot for boiling (one with a pour spout would be ideal)
- Two small bowls, like dessert bowls
- Plastic wrap
- A $\frac{3}{4}$ -cup measuring cup
- A $\frac{1}{2}$ -teaspoon measuring spoon
- A measuring tablespoon
- A stove
- A stirring spoon
- A cotton swab, like a Q-tip
- Iodine
- Two small glasses, like juice glasses
- A medicine dropper
- An 8.5x11 sheet of white paper
- Latex or rubber gloves, like those used for cleaning
- Ammonia (It is sold in supermarkets with the cleaners.)
- Toilet bowl cleaner that has hydrochloric acid as its active ingredient (The ingredient list might say “HCl” or “hydrogen chloride” instead of “hydrochloric acid.” **Do not use any that have bleach!**)

Chapter 8:

- 5 pennies
- Clear vinegar
- Hydrogen peroxide (Sold in supermarkets and drug stores. It is commonly used to clean wounds.)
- Water
- A small glass, like a juice glass
- A pot to boil water
- A stove
- A measuring tablespoon
- Several green leaves (Ideally, these come from a tree whose leaves change into pretty colors in the fall. If it's the wrong time of year or you don't have access to plants, you can use leaves from a store-bought, green vegetable. Leaves from beets work really well, as do red lettuce leaves.)
- Rubbing alcohol
- A wooden spoon
- Plastic wrap
- Wooden spoon
- A paper towel
- Scissors
- Aluminum foil
- A stove
- Tongs
- At least 6 golf-ball-sized rocks (Golf balls will work as well.)
- A small paper bag, like the kind you pack lunches in
- A hand-held hair drier

Chapter 9:

- A chicken leg, wing, or breast with the skin still on it. (A leg is the easiest to use, and a wing is the hardest.)
- A sharp knife
- A surface on which you can cut the chicken part, like a cutting board
- Paper towels
- Water
- A pan and stove for boiling
- A bowl
- Toilet bowl cleaner that has hydrochloric acid as its active ingredient (The ingredient list might say “HCl” or “hydrogen chloride” instead of “hydrochloric acid.” **Do not use any that have bleach!** You used it in an experiment in Chapter 7.)
- Rubber cleaning gloves
- A round balloon (as opposed to one that is long – see the rightmost picture on page 225)
- Two lids from small jars or large pill bottles (They don’t need to be the same size, but they need to be a lot smaller than the balloon once it is inflated. See the rightmost picture on page 225.)
- String
- Tape
- Scissors
- A chair
- Two antacid tablets
- White vinegar
- Petroleum jelly (like Vaseline)
- Two small glasses, like juice glasses
- Lots of wooden tiles, dominoes, or Legos (all the same shape – see the picture on page 234)
- Three or four bamboo skewers or long, thin sticks like chopsticks

Chapter 10:

- Two metal paper clips
- A ruler that reads in cm
- A die (The kind that you roll in games like Yahtzee)
- Tape
- A sheet of dark construction paper (Black is ideal)
- Flour
- A sink
- Play-doh or other modeling clay
- A wooden skewer or chopstick
- A table and chair
- Cornstarch
- Water
- A big stirring spoon (Wooden is ideal.)
- A bowl that you would use to hold soup or cereal
- A 1-cup measuring cup
- A ½-cup measuring cup
- A ⅓-cup measuring cup

Chapter 11:

- Cardboard (It is best for it to be thin, because you have to cut it and poke holes in it.)
- Two thumbtacks
- Three paper clips
- Tape
- Scissors
- String
- Someone to help you
- A copy of the arm bones found with the answers to the chapter review (optional)
- A spool of thread
- A chair
- A 30-cm (12-inch) ruler
- A pencil (One with flat edges works better than one that is round.)
- Five pennies
- A stopwatch or some other way to mark the passing of one minute
- A place to do jumping jacks

Chapter 12:

- A plastic, 2-liter bottle, like the ones soda comes in
- Two bendy straws
- Two small balloons
- A plastic sandwich bag
- Modeling clay, like Play-Doh
- Tape
- Scissors
- A sink that can be plugged and filled with water
- An empty gallon jug (or 4-liter bottle)
- A measuring cup that measures the volume of liquids
- Vinegar (any kind)
- Baking soda
- Red (some people call it purple) cabbage
- A large bowl (Not a mixing bowl, but more than a cereal bowl.)
- Two Styrofoam (or paper) cups (They should be white on the inside.)
- Two spoons
- Plastic wrap
- A small pot to boil water
- A stove
- A balloon (any shape and size)
- Two rubber bands that are close to the same length but very different in thickness
- A glass that is small enough to allow rubber bands to stretch around lengthwise but large enough to make the rubber bands tight (see the lower picture on page 307)

Chapter 13:

- White vinegar
- Two TUMS antacid tablets (You can use another brand, but try to get one with big tablets, and the active ingredient must be calcium carbonate.)
- A sharp knife
- A strainer or colander
- A sink
- Two tea bags that hold black tea (It doesn't matter if it is caffeinated or not. If you have unpackaged black tea that you use with an infuser, that will work as well. Just use a tablespoon of tea instead of a bag of tea.)
- Baking soda
- Scissors (if you are using tea bags)
- Water
- Something to make hot water for tea
- A mug
- Three small glasses, like juice glasses
- Two spoons
- Hydrogen peroxide
- A raw potato
- Liquid soap (dish soap is best)
- Vegetable oil
- Lemon juice (It doesn't have to be straight from the lemon, but it must be real lemon juice.)
- Milk
- A 1-cup measuring cup
- A ¼-cup measuring cup
- A 1-tablespoon measuring spoon
- A 1-teaspoon measuring spoon
- A ½-teaspoon measuring spoon
- A ¼-teaspoon measuring spoon
- A handful of dirt
- A large glass or pitcher with a spout that you can use for pouring.
- Water
- A coffee filter
- A funnel
- A paper towel
- A small bowl

Chapter 14:

- A small object that you can grab, like a coin or a piece of candy
- A table that allows you to sit across from someone and put something that is within arm's reach for both of you.
- At least three other people of any age (They can each be used at a different time.)
- A pencil or pen
- A piece of paper that can be written on
- A counter or desk that can be used for writing
- A phone (It doesn't have to work.)

- A chair that is high enough that your feet cannot touch the floor when you sit on it (If you don't have a chair that high, pile some large, hardcover books on the chair and sit on them.)
- A clear baking pan
- A beanbag or some other soft, throwable object, like a Nerf ball.
- A tall glass that you can see through (It can be plastic, but it must be transparent.)
- A second glass that need not be transparent but holds about the same amount of water.
- A white piece of paper that is about the same width and height as the glass (Just cut a piece to that size if you need to.)
- A marker
- Water
- Plastic wrap

Chapter 15:

- A small package of dried beans (They shouldn't be very large. The ideal length is about 1.3 cm [$\frac{1}{2}$ inch]. I used great northern beans for my experiment.)
- A permanent marker that will make easy-to-see marks on the beans
- A container with a lid that can hold at least two cups of beans
- A measuring tablespoon
- A measuring cup
- A plate
- At least twelve 3-inch by 5-inch index cards (If you don't have index cards, cut 3-inch by 5-inch rectangles out of thin cardboard or heavy construction paper.)
- Several sheets of paper
- Scissors
- A large, flat surface like a table or countertop
- Graph paper or a computer program that can make a graph

Chapter 16:

- A yard, a park, garden, or some other outside area that has plants (and animals) in it.
- A small spade or large spoon that you can use for digging
- Gloves (Like work gloves or gloves used for cleaning)
- A rectangular casserole dish or shallow plastic tub
- Colored pencils or crayons
- A two-liter bottle, like the kind soda comes in
- Hydrogen peroxide
- Yeast (Even yeast for a bread machine will work.)
- A funnel
- A measuring teaspoon
- A 1-cup measuring cup
- A candle that stands up on its own
- A glass that is tall enough so that when it is put over the candle while the candle is lit, the flame won't come anywhere close to touching the glass
- Something with which to light the candle
- A counter that has all flammable materials removed from it