

## Consolidated List of Lab Supplies for Science in the Industrial Age

The supplies listed at the end in red are used for the challenge lessons. If you are not doing those lessons, you don't have to worry about those supplies.

- 👉 A potato
- 👉 A slice of bread
- 👉 A treat the student really likes
- 👉 Baking soda
- 👉 Bouillon cubes (beef or chicken) or meat broth that is not cloudy
- 👉 Butter
- 👉 Cake mix (or you can make a cake from scratch)
- 👉 Candies or fruits that look like the things pointed out in the drawing on page 100. (For example, I used M&Ms for the lysosomes, Mike and Ikes for each mitochondrion, gummi worms for the Golgi bodies, and Airheads Xtremes for the endoplasmic reticulum. Don't worry about the nucleus. That will be made with a lump of icing.)
- 👉 Cheese (any kind)
- 👉 Clear soda (like Sprite, 7-Up, or seltzer water) in unopened, clear plastic bottles (You need three bottles, the smaller the better. Diet sodas are just as good as regular sodas.)
- 👉 Coke, Pepsi, or any other dark soda your child will enjoy (You need only one cup.)
- 👉 Cooking oil
- 👉 Green food coloring
- 👉 Meat tenderizer (Adolph's and McCormick are two popular brands.)
- 👉 milk (Whole milk is best.)
- 👉 Red (sometimes called purple) cabbage
- 👉 Red food coloring
- 👉 Salt
- 👉 Seltzer water (plain, carbonated water – you need only two cups)
- 👉 Sugar
- 👉 Vanilla
- 👉 Vanilla icing
- 👉 Yeast
- 👉 Yellow food coloring
- 👉 A  $\frac{1}{8}$  measuring teaspoon (If you don't have one that small, fill a  $\frac{1}{4}$  measuring teaspoon halfway.)
- 👉 A  $\frac{1}{4}$  measuring teaspoon
- 👉 A  $\frac{1}{2}$  measuring teaspoon
- 👉 A measuring teaspoon
- 👉 A measuring tablespoon
- 👉 A  $\frac{1}{4}$ -cup measuring cup
- 👉 A  $\frac{1}{2}$ -cup measuring cup
- 👉 A 1-cup measuring cup
- 👉 A tablespoon
- 👉 A teaspoon
- 👉 Four  $\frac{1}{2}$ -liter plastic bottle, like the kind water comes in (Thin-walled bottles are best, and three need to have their lids.)
- 👉 A bar magnet or a horseshoe magnet (Both would be ideal, but you need at least one of them. If you don't know what they are, look at the drawings on page 48.)

- ✎ Four 2-liter plastic bottles, one of which must have a lid
- ✎ A 3-ring binder
- ✎ A 9-volt battery
- ✎ Two D or C cell batteries
- ✎ Two round balloons that are at least 8 inches in diameter when inflated
- ✎ A ball-point pen
- ✎ A pencil
- ✎ A bathtub
- ✎ Several blank sheets of white paper
- ✎ Several bowls of different sizes
- ✎ A brown paper bag
- ✎ A camera
- ✎ A candle in a holder or able to stand on its own.
- ✎ A circular cake pan
- ✎ A clear plastic cup
- ✎ A compass
- ✎ A container of matches (Wooden matches work best, but paper matches will do in a pinch.)
- ✎ A dark room with a blank space on one wall
- ✎ A dimly-lit room
- ✎ A large plate
- ✎ A dishcloth
- ✎ A fork
- ✎ A freezer
- ✎ A funnel
- ✎ Two flashlights of similar brightness
- ✎ An LED flashlight (If you don't have an LED flashlight, use an uncovered lamp with an incandescent bulb.)
- ✎ A flat counter (not made of anything flammable)
- ✎ A hammer
- ✎ A jar that can experience large temperature changes, like a canning jar
- ✎ A knife
- ✎ A ladle
- ✎ Two large plastic freezer bag, like a gallon-sized Ziploc bag
- ✎ Seven regular-sized Ziploc bags
- ✎ A large screwdriver
- ✎ A large, clean serving tray or cookie sheet
- ✎ A lighter
- ✎ A marker or crayon
- ✎ A metal hanger
- ✎ A metal paper clip
- ✎ A metal pie pan
- ✎ A metal sewing needle (It should be pretty lightweight. Don't use a really big one.)
- ✎ A microwave oven
- ✎ A mug or cup used for hot drinks
- ✎ A nail
- ✎ A pad of paper that has several sheets attached to one another at the top but unattached at the bottom, like a pad of Post-it notes (See the picture on page 155.)

- ✎ Paper towels
- ✎ A pin, preferably with a tiny ball as its head
- ✎ A Ping-Pong ball
- ✎ A plastic spoon that can be ruined
- ✎ A pot for boiling (Ideally, it should have a pour spout on it.)
- ✎ A pot holder
- ✎ A radio (It is best if it has an AM band, and the smaller, the better.)
- ✎ A refrigerator
- ✎ A ruler
- ✎ Three sheets of black construction paper
- ✎ A sink with a water faucet
- ✎ Two small plastic trash bags or grocery bags that can be thrown away
- ✎ A spoon
- ✎ A stopwatch (or other timer that keeps track of seconds)
- ✎ A stove
- ✎ A straw
- ✎ Play-Doh or other modeling clay
- ✎ Ten Styrofoam cups
- ✎ A tea bag or some coffee grounds
- ✎ A towel
- ✎ A vertical, metal surface on which you can stick the magnets (Such as a refrigerator door or a metal filing cabinet.)
- ✎ A window
- ✎ A wire hanger (It needs to be one that your parents will let you break. If you can't find a hanger, you can use a metal wire, as long as it is rigid but bendable, just like a wire hanger.)
- ✎ A wooden food skewer or a small twig from a bush or tree
- ✎ Aluminum foil (Heavy duty is best, but you can make regular aluminum foil work.)
- ✎ Ammonia
- ✎ An empty soup can (or any metal can of similar size)
- ✎ An index card
- ✎ An oven mitt
- ✎ At least 7 quarters and 7 nickels (If you do not have U.S. currency, use two coins that are quite different in size.)
- ✎ Bare copper wire (16 – 18 gauge works best. You can buy this in the jewelry-making part of a craft store or in a hardware store.)
- ✎ Blue food coloring (liquid, not gel)
- ✎ Cellophane tape
- ✎ Dish soap
- ✎ Distilled water (It is sold in most grocery stores, but make sure it is *distilled* water, not drinking water. You will use it later on, so get at least two liters, which is about half a gallon.)
- ✎ Duct tape
- ✎ Eight toothpicks
- ✎ Epsom salt (Sold in any drug store and in the pharmacy section of most large supermarkets. Its chemical name is magnesium sulfate.)
- ✎ Flour
- ✎ Four small glasses, like juice glasses

- ✎ Grape juice (It must be juice. It cannot be an artificially-flavored grape drink. A different dark fruit juice will work, but not as well.)
- ✎ Gumdrops of four different colors (You will need two each of three colors and eight of the fourth color.)
- ✎ Hydrogen peroxide (It is sold in drug stores to clean wounds.)
- ✎ Ice
- ✎ Kitchen tongs
- ✎ Photocopies of pages A4–A10 in the *Helps & Hints* book that comes with this course
- ✎ Plastic wrap
- ✎ Pliers
- ✎ Rubber or latex gloves, like the ones used for cleaning
- ✎ Rubbing alcohol
- ✎ Scissors
- ✎ Several books
- ✎ Several marbles
- ✎ Soft treats like gumdrops, marshmallows, gummy bears, etc. (You need at least a dozen.)
- ✎ Steel wool
- ✎ String
- ✎ Thread
- ✎ Three metal cans, like the kind soup comes in
- ✎ Three very similar long, thin objects (Food skewers would be ideal, but three very similar pencils will work. The thinner the better. Toothpicks aren't long enough.)
- ✎ Two ½-liter plastic bottles, like the ones water comes in (They must have their lids.)
- ✎ Two 2-liter plastic bottles, like the kind soda comes in
- ✎ Two balloons of the same size and shape (6-inch to 9-inch round balloons are ideal.)
- ✎ Two bowls of the same size
- ✎ Two clean, shiny pennies minted in 2010 or later (Any post-1982 penny should work, but the ones made in 2010 or after seem to work the best.)
- ✎ Two colors of food coloring
- ✎ Two drinking glasses (Plastic is best, but glass will work.)
- ✎ Two eggs
- ✎ Two food skewers that are made of plastic or wood
- ✎ Two jar lids or small dishes that are deep and large enough to hold three tablespoons of material but small enough to fit into Ziploc bags after they have been zipped (You can also use the bottoms of two paper cups you have cut down.)
- ✎ Two metal paper clips
- ✎ Two metal thumbtacks
- ✎ Four nails, two of which must be shiny
- ✎ Two plastic cups that can be ruined
- ✎ Two Q-tips or small paintbrushes
- ✎ Two quarters (If you don't live in the U.S., use two fairly large coins.)
- ✎ Two saucepans or pots (They can be very small, but they need to be very clean. The bottoms of the pots shouldn't have any stains or burn marks on them.)
- ✎ Two straws, at least one of which must be able to bend
- ✎ Two tall glasses that are transparent and can hold at least two cups of liquid
- ✎ Water
- ✎ Wax paper

- 👉 White vinegar
- 👉 Wire cutters or strong scissors
- 👉 2-4 strong, circular magnets (They are often called “neodymium magnets.” Craft stores sell them as “craft magnets.” Most packages hold several, even though you might see only two or three when you look at the package. See the photo on page 43 to get an idea of how big they should be.)
- 👉 A colander or other device that will allow water to pass through it but not allow large things to pass through it.
- 👉 A copper pipe that is at least 15 centimeters (6 inches) long and big enough for the magnets from the first set of lessons to fit comfortably inside the pipe (For the best effect, the pipe should be only a bit wider than the magnets. You want the magnets to be able to travel through the pipe, but you want the edges of the pipe close to the magnets.)
- 👉 A hair dryer
- 👉 A plastic fork
- 👉 A rubber band that is at least half as wide as the paper clip
- 👉 A sheet of cardboard that is about 22 cm x 28 cm (8.5 inches by 11 inches)
- 👉 A small rock or marble that will also fit comfortably inside the pipe
- 👉 A spoon large enough to hold an egg
- 👉 A string of incandescent Christmas lights
- 👉 A string of LED Christmas lights (not necessary, as there is an internet video you can watch)
- 👉 A tall, thin glass (Ideally, it should be tapered at the bottom.)
- 👉 Clear nail polish
- 👉 Corn syrup
- 👉 Five pennies (or coins of similar thickness)
- 👉 Fruit juice or some other sweet drink
- 👉 Gloves
- 👉 Large wooden matches (at least three, but ideally, lots more)
- 👉 Popcorn (This can be a bag of microwave popcorn or popcorn that is made on the stove.)
- 👉 Several small rocks or paperweights
- 👉 Speakers for a computer (Any speakers that have a plug similar to the one pictured on page 221 will work. If you don’t have speakers, you can use earphones, but **don’t put the earphones on or in your ears**. Have a helper hold them a few inches away from your ears.)
- 👉 Sunblock lotion (The higher the SPF, the better.)
- 👉 Three different sheets of construction paper, each of a different color (One should be red.)
- 👉 Three eggs (raw)
- 👉 Three leaves that have interesting shapes
- 👉 Three metal forks that are the same size, shape, and weight
- 👉 Tonic water (This can’t be seltzer or plain carbonated water. It needs to have quinine in the ingredients list. Any place that sells liquor, including supermarkets, will carry it. It will be with the “mixers” that are added to alcoholic drinks and should cost less than a dollar for a small bottle, which is all you need. There is no alcohol in tonic water.)
- 👉 Turmeric (This is a spice. Don’t use turmeric supplements, because they are expensive and have other things in them. If you don’t already have it, get a small bottle from the spice section of any supermarket.)
- 👉 Two jars or soup cans that are full
- 👉 Two thin 8.5x11-inch sheets of cardboard, like the kind found on the back of a pad of paper