

Discovering Design With Earth Science
Experiment Supplies Needed

In order to do the experiments in this course, you need to have the kit that has been designed for this course. The contents are:

Lab Kit Designed for *Discovering Design With Earth Science*

- **Mineral Specimens:** Quartz (one transparent, one opaque), muscovite mica, potassium feldspar, calcite, fluorite, and hematite.
- **Rock Specimens:** Granite, basalt, pumice, sandstone, limestone, siltstone, marble, slate, gneiss
- **Fossil Specimens:** Clam, brachiopod, shark tooth, petrified wood, crinoid stem
- **Sediment Specimens:** Sand, silt, clay, and plaster
- Magnifying glass
- Iron nail
- Penny
- White streak plate
- Black streak plate
- Glass tile
- Magnet
- Two dropper bottles
- 10% hydrochloric acid solution
- pH paper
- Digital mass scale
- 2 medicine droppers
- Funnel
- 4 tea bags (Bigelow brand)
- 4 TUMS antacid tablets
- Epsom salt
- Hydrogen peroxide
- Graduated cylinder

In addition to the lab kit, the following household items are needed:

- Active dry yeast (Yeast for a bread machine will also work.)
- Aluminum foil
- Ammonia (Sold in supermarkets with the household cleaners. You need only a drop or two.)
- At least two of the following light sources: an incandescent light, a fluorescent light, or an LED light (An incandescent light is a standard bulb that heats up a filament to make light. You can use a light bulb from an uncovered lamp or an incandescent flashlight. There are compact fluorescent light bulbs that fit in a normal lamp, and some camping lanterns use fluorescent bulbs. Most cell phones have a flashlight app that's an LED light, and you can also use an LED flashlight or an LED light bulb made for lamps.)
- Baking soda
- 4 balloons
- Bendy straw
- 6 clear, plastic bottles, 3 of which have lids
- 2 bowls, like soup bowls
- Can opener
- Carbonated beverage like soda pop, seltzer water, etc.
- Casserole dish or a large bowl
- CD or DVD that you don't mind ruining
- Clean, dry hair
- Cleaning gloves

- 60 coins (You can actually use 60 of any small objects that have two easily-distinguished sides, like M&M candies. When the experiment and text refer to “heads” and “tails,” you can just substitute the two sides of whatever object you are using.)
- 2 small containers that can go in the freezer (Ideally, this would be two rectangles in an ice cube tray. Otherwise, two pill bottles or something of that size.)
- Cutting board
- 2 small cups or mugs for hot drinks (Styrofoam cups, for example, or coffee mugs)
- 3 Styrofoam or paper cups
- Dark food coloring (Blue works best.)
- Empty metal can, like the kind vegetables come in
- Empty thin aluminum can with a small opening, like the kind soda comes in (More than one is even better.)
- 2 different colors of food coloring
- Fork
- Freezer-safe bowl
- Glass baking dish
- 4 small glasses, like a juice glass
- Hand spade or a strong spoon that you can use to dig
- Ice
- Index card (It can have lines on it, but it needs to be mostly white.)
- 2 lamps from which the shades can be removed
- 3 bulbs for lamps, two of which have the same brightness (listed in watts) and one with a different brightness (They should really be either all normal (incandescent) bulbs, all compact fluorescent bulbs, or all LED bulbs. If you use LED bulbs, make sure they all produce the same shade of white light, because some are bluer than others. If you can’t find a bulb with a different brightness, use three lamps instead.)
- Large serving spoon
- LED flashlight (If you don’t have an LED flashlight, use a flashlight app on a smartphone. Ideally, the face of the flashlight should be smaller than the bottom of the glass.)
- Length of sewing thread that is about 61 cm (24 in) long
- Lid for a pot
- M&M candies (You need two each of four different colors. See the photo below.)
- Many books of different thicknesses
- Marble or small ball
- 2 colors of marker or crayon (You want to leave thick marks on the paper. I use red and blue in my discussion, but you can use any colors you want.)
- Matches
- 5 metal paper clips (They must be bare metal, not covered in plastic.)
- Meterstick or some other long, thin stick
- Milk
- 2 full sheets from a newspaper, or two of any sheet of paper that is about 60 centimeters x 60 centimeters (23 inches x 23 inches). You can also tape pieces of paper together to make two sheets that size
- Oven

- Oven mitts or pads
- Pair of tongs that are wooden, plastic, or have plastic covers on its ends
- Pan for boiling
- 30 sheets of plain paper
- Paper towels
- Pen or other object that can make a hole in a Styrofoam cup
- Pencil
- Pepper
- Pie pan
- Pitcher or other container that holds and pours liquids
- Place in a yard or park where you can dig. (If you don't have access to such a place, find a potted plant and use some of the soil in the pot, skipping steps 1-3. Soil from outside is better.)
- Plastic container with a lid that is wider than it is tall
- Plastic wrap
- 2 plates that are either metal or ceramic
- Play-Doh or other soft modeling clay
- Quarter or other large coin
- Raw potato
- Rectangular baking pan that is at least 28 cm (11 in) long and 5 cm (2 in) deep (glass is best)
- Rice, small beans, or something else made of small grains. (You can use dirt, sand, flour, etc., but there is a possibility that the bag will break, so definitely do the experiment outside if you decide to use something like that.)
- Rubber band
- Rubbing alcohol (If you have denatured alcohol, that's even better.)
- Ruler
- Scissors
- Set of measuring cups
- Set of measuring spoons
- Sewing needle that is strongly attracted to the magnet (most metal ones will be)
- Sharp or serrated knife
- Sheer hosiery that can be cut up (A couple of coffee filters will also work.)
- Single ice cube
- Sink that is **not** stainless steel, has a faucet, and can be plugged
- Something to cover your eyes, like safety glasses or goggles
- Spoons for stirring
- Standard battery (AA or C work best)
- Stick of butter or margarine
- Stick that is at least 30 centimeters (1 foot) long and would be easy for you to break in two with your hands (It can be a dead stick from a tree or a thin piece of wood, but it must be much longer than it is wide.)
- Stove or hotplate
- 4 straws
- 15-cm (6-inch) length of string that is stronger than thread

- Tall, thin box, like a cereal box
- Tall, transparent glass
- Tape
- The cardboard tube from the center of a roll of toilet paper
- Toilet paper
- Toothpicks
- Transparent jar with a lid
- Vegetable oil (Olive oil or any other liquid cooking oil will work.)
- Water
- Waxed paper or a plastic sandwich bag
- White vinegar
- 2 small (“snack sized”) plastic bags that can be zipped shut (like Ziploc bags)
- 5 standard (“quart sized”) plastic bags that can be zipped shut (like Ziploc bags)