Most of the experiments in the course don't take much time, but some are long-term experiments. However, you don't have to worry about looking ahead to see whether an experiment is long-term or short-term. If a long-term experiment is coming up, you will be notified of it with a note that is set off in a yellow box. It will warn you to look ahead at the upcoming long-term experiment, and it will tell you when that experiment needs to be started. Thus, you need not read ahead in the book. Everything you need to know will be presented as you need to know it.

********* **Please Do The Experiments With Common Sense And Adult Supervision**. *********

You will not find these experiments to be any more dangerous than cooking or cleaning, but that doesn't mean children can't get hurt. Supervise your children and coach them that oven burners, open flames, and electricity should be treated with care, and unless you are specifically instructed in the book to do so, you should *never* eat or drink anything that comes from an experiment!

Experiment Supplies

The experiments use only common household items, but of course, some items are more "common" than others. Here is a list of the things that are a bit unusual and might take some time to find. The supplies listed in red are used for the challenge lessons. If you are not doing those lessons, you don't have to worry about those supplies.

Materials That Might Take Some Time to Acquire

For the first set of lessons (Lessons 1-15):

- A mothball
- A bar of Ivory soap (Other brands will work, but not nearly as well.)
- A pomelo (It is sometimes called a pummelo. It would be ideal to have one, but don't worry if your supermarket doesn't carry it. There are pomelo pictures that the student can use in the experiment.)
- Hydrogen peroxide (It is sold in drug stores to clean wounds.)

For the second set of lessons (Lessons 16-30):

- A plastic pill bottle or film canister with a lid
- Two very different flowers (They can be from plants in the house or outside, and they can also be from a florist. Ideally, at least one of them should have easily visible stalks at the center, as shown in the picture on page 74.)
- Wintergreen mints (Wintergreen Altoids and Wint O Green Life Savers are the best.)

For the third set of lessons (Lessons 31-45):

- A magnet (the stronger, the better)

For the fifth set of lessons (Lessons 61-75):

- A box of colorful jawbreakers (These are hard candies. For best results, use Willy Wonka's Everlasting Gobstoppers).

For the sixth set of lessons (Lessons 76-90):

- A feather (It can be a natural feather, but please note that many natural feathers are actually illegal to have, even if you just pick them up from the ground. Duck and goose feathers are the safest if you use natural feathers. Feathers can also be purchased at any craft store. You want a

feather in which at least part of the feather is flat and not fuzzy, and the lighter the color, the better. See the picture on page 239.)

- Root Kill (Sold at hardware stores to kill roots that get into underground pipes.)

Here is a list of everything you need to do the experiments, separated by the time frame that is being studied. Remember that each time frame is six weeks' worth of lessons, so making sure you have everything for a given time frame ensures that you have six weeks of science supplies ready. Note that the things listed previously are also contained in the list below. In addition, the materials for the challenge lessons are in red.

Supplies for Science in the Early 18th Century (Lessons 1-15)

- A mothball
- A jar
- A small plate that is bigger than the jar's opening (It can't be made of paper or plastic.)
- A pot for boiling
- Water
- A stove, preferably one with an exhaust fan
- Ice
- A bar of Ivory soap (Other brands will work, but not nearly as well.)
- A potato
- A marshmallow (not the tiny ones that you put in hot cocoa)
- A microwave oven (It is best to use one you can see inside while the food is cooking.)
- A microwave-safe plate
- A serrated knife
- An orange
- A white grapefruit
- A pomelo (It is sometimes called a pummelo. It would be ideal to have one, but don't worry if your supermarket doesn't carry it. There are pomelo pictures that the student can use in the experiment.)
- A knife that can cut the fruits listed above
- A spoon
- A cutting board
- Two plates (three if you managed to get a pomelo)
- Some paper towels
- A glass of water
- Red cabbage (It is sometimes called "purple cabbage.")
- White vinegar
- Ammonia
- Hydrogen peroxide (It is sold in drug stores to clean wounds.)
- Four small glasses, like juice glasses (Three of them need to be the same size.)
- A 1-cup measuring cup
- A ⅓-cup measuring cup
- A measuring teaspoon
- Two blank white sheets of paper
- Scissors

- Cellophane tape
- A pushpin
- A pencil
- A canning jar (It needs to be a transparent jar with an airtight lid that can withstand big temperature changes.)
- A plastic bag
- A few small pebbles
- Pot holders
- Three stalks of celery with some of the leaves still on them (They don't need a lot of leaves.)
- A small plastic sandwich bag
- Blue food coloring (Blue is the color that shows up best.)
- A fan
- Two apples
- A paper bag (or a deep bowl that can be covered)
- A balloon
- Three straws
- Some aluminum foil
- A sink with a faucet
- A tall glass
- A magnifying glass
- A tall, thin box, like the boxes cereal comes in
- A CD that you don't mind ruining
- A serrated knife
- Scissors
- A lamp with a removable shade
- An incandescent light bulb (This is what used to be called a "regular" light bulb. It has a filament that glows to produce light.)
- A compact fluorescent light bulb or an LED light bulb
- A room that can be made fairly dark
- Six cotton balls (They need to be made of cotton, not a synthetic fiber.)
- A blender
- A strainer
- A metal spatula
- A pie pan
- A clothes iron
- A cookie sheet
- A chair
- A plastic 2-liter bottle with a screw cap, like the kind soda pop comes in
- A nail
- A pen
- Two bendable straws

Supplies for Science in the Middle of the 18th Century (Lessons 16-30)

- A plastic pill bottle or film canister with a lid (See the bottom picture on page 50.)
- Aluminum foil
- Cellophane tape

- Salt
- Water
- A metal paper clip (not one with a plastic coating)
- A hammer
- Four nails (Use shiny nails.)
- A balloon
- A hair dryer
- 16 pennies
- A small pot for boiling water
- Metal kitchen tongs
- A plate
- A stove
- A stopwatch or a watch with a second hand
- A pie pan
- A candle that can stand on its own or is in a holder
- Matches or a lighter
- A sink
- Steel wool
- Wintergreen mints (Wintergreen Altoids and Wint O Green Life Savers are the best.)
- A pair of pliers
- A dark room with a sink
- A 9-volt battery
- A dimly-lit room
- Rubbing alcohol (The higher the percentage of alcohol, the better.)
- Two small glasses, like juice glasses
- Two very different flowers (They can be from plants in the house or outside, and they can also be from a florist. Ideally, at least one of them should have easily visible stalks at the center, as shown in the picture on page 74.)
- Crayons or colored pencils
- A nice, bright light under which you can examine your fingers
- A magnifying glass
- An orange (the fresher the better)
- An apple
- A banana
- A lemon (A lime or grapefruit could be used instead, but the effect is best with a fresh lemon.)
- A sharp knife for peeling
- A small pot for boiling water
- A pot lid with a holder on top (It doesn't have to fit the pot you are using.)
- A wide bowl that isn't as tall as the pot
- A Ziploc bag
- Ice
- A Tablespoon
- Two Styrofoam cups
- A ½-cup measuring cup
- A large bowl
- A spoon for stirring
- A strainer

- Two identical balloons
- A funnel
- A Styrofoam plate that has enough of a raised edge that is a bit like a very shallow bowl (See the picture on page 67.)
- A Styrofoam cup (the larger the better, but any size works)
- A straw
- A pen
- Scissors
- A small amount of Play-Doh or modeling clay
- A bathtub
- A glass that has a stem, like a wine glass. (Ideally, the glass shouldn't be really thick, but any stemmed glass will work to one degree or another.)
- Two small glasses, like juice glasses
- A clear soda, like Sprite (Room temperature is better than chilled, and it should be an unopened bottle or can.)
- White vinegar
- Two TUMS tablets (They could be any antacid whose active ingredient is calcium carbonate.)
- A 1-cup measuring cup
- Several raisins

Supplies for Science in the Mid-to-Late 18th Century (Lessons 31-45)

- A magnet (the stronger, the better)
- A metal paper clip (If your magnet is weak, use the smallest one you can find.)
- String (If your magnet is weak, use thread.)
- Scissors
- A Styrofoam plate (A paper plate will not work.)
- A Styrofoam cup
- A metal pie pan
- Tape
- A large sink with a faucet
- A clear plastic bottle with a screw cap (The kind soda or water comes in works great. The size doesn't really matter.)
- A serrated knife
- Water
- Salt
- Two 9-volt batteries
- A bowl that is deeper than the 9-volt battery is tall
- Matches or a lighter
- Six clear plastic ½-liter bottles, like the kind water comes in
- Three balloons whose openings can fit over the ½-liter bottles listed above
- Steel wool
- Vinegar
- Two table knives
- A bowl with a diameter large enough to hold two ½-liter bottles but small enough so the table knives mentioned above can span the opening (See the picture on page 107.)

- A microwave oven
- A pot that is deep enough to submerge a large portion of a ½-liter bottle.
- Ice
- Oven mitts
- Lemon juice (You can squeeze a lemon if you like, but the lemon juice you buy at the store is fine. Please note that it must be pure lemon *juice*. It cannot be a lemon-flavored drink.)
- Baking soda
- Sugar
- A ½-cup measuring cup
- A measuring teaspoon
- Two small glasses, like juice glasses
- A spoon for stirring
- Two *fresh* leaves from a plant. They need to be picked directly from the plant and used in the experiment right away.
- A bright lamp or sunny windowsill
- A dark room
- A tapered candle (This is a taller candle that doesn't stand on its own.)
- Hydrogen peroxide (It is sold in drug stores to clean wounds.)
- Yeast
- A funnel
- Something to measure 1½ cups of liquid
- Steel wool
- Vinegar
- A standard flashlight (It can't use LEDs or a fluorescent bulb.)
- An uncooked hotdog
- Grass (You will pull it from a lawn. It doesn't need to be green.)
- A small potato
- A green vegetable like asparagus or broccoli (not lettuce)
- A knife for cutting vegetables
- A dark place where the experiment can sit, like a closet that is rarely used
- A pin
- Uncooked rice
- A rectangular, metal baking pan, like the kind used to bake cakes
- A sturdy table
- A sheet of white tissue paper (not facial tissue or toilet tissue, but tissue paper)
- Watercolor paint or fingerpaint (any color will do)
- A brush
- A dish towel
- A sheet of standard white paper
- Play-Doh or modeling clay
- A straw that bends
- A clear plastic ½-liter bottle, like the kind water comes in

Supplies for Science in the Late 18th Century (Lessons 46-60)

- Four pennies (If you live in a country other than the U.S., any copper-coated coin will work.)
- Four washers (They need to be at least a bit larger than the pennies, and they need to look shiny and silvery. That means they are coated in zinc.)
- A paper towel
- Scissors
- Lemon juice
- Aluminum foil
- A small bowl or cup
- A few leaves of lettuce or spinach (The darker green the leaves, the better.)
- Rubbing alcohol
- Water
- A stove
- A pot for boiling water
- A mug you use for hot drinks
- Two spoons
- A ½-cup measuring cup
- A strainer or colander
- Three small glasses, like a juice glass (They need to be transparent.)
- Elmer's Glue (or any glue that dries clear)
- A small paintbrush (You can use your finger; it will just be messier.)
- A potted plant with a couple of leaves that are large enough to paint with glue. (You can also use a plant that is outdoors, but strong rains might affect the experiment.)
- A ½-liter plastic bottle, like the kind water comes in, with its crew cap (It needs to be a thin-walled bottle.)
- A reasonably bright flashlight
- A metal paper clip
- Construction paper (preferably black)
- Aluminum foil
- Plastic wrap
- Four bouillon cubes
- A measuring cup
- Two canning jars or clear glasses that are safe for holding boiling water
- Two rubber bands that will fit tightly around one of the jars or glasses
- Hot pads
- Baking soda
- A ¼-teaspoon measuring spoon
- A large cake pan, preferably made of glass (A metal one will work, as long as the bottom is very smooth.)
- Dish soap
- A straw
- Two balloons (At least one of them must be round.)
- Some string
- Scissors
- Cellophane tape
- A marker that will make a permanent mark on a balloon

- A freezer with enough room to hold a balloon when it is inflated
- A metal plate or cooking pan (It needs to be made of sturdy metal and have a small lip to it.)
- A paper plate
- Two ice cubes of roughly the same size
- Red (sometimes called purple) cabbage
- White vinegar
- Ammonia
- Two white, Styrofoam cups
- Two other cups (They can be any cups, including white Styrofoam cups)
- Water
- A ¼-cup measuring cup
- A 1-cup measuring cup
- A small saucepan
- A measuring teaspoon
- A small Styrofoam or paper bowl (You can use a Styrofoam or paper cup as well, just cut the top off so it is as shallow as a typical small bowl.)
- A large bowl (made of anything) that is larger and deeper than the Styrofoam or paper bowl
- A large measuring cup or a pot that has a spout you can use for pouring (A tall glass will do in a pinch.)
- Two table knives
- Food coloring (This is optional, but it makes the water easier to see.)
- A pen
- A blindfold

Supplies for Science at the End of the 18th Century (Lessons 61-75)

- A stick of butter or margarine
- Flour
- A small microwave-safe bowl
- A microwave oven (You can use a stove, but you should substitute a small pot for the bowl.)
- A serrated knife
- Plastic wrap or wax paper
- Pot holders
- A sink
- A bar of soap
- A serrated knife
- A sink with a faucet that is easily adjustable for different amounts of water flow
- Some paper towels
- Oatmeal (uncooked)
- Water
- A ¼-cup measuring cup
- A ½-cup measuring cup
- A cookie sheet
- Aluminum foil
- An oven
- A bowl
- A spoon
- Rubbing alcohol

- Matches or a lighter
- Two bowls
- Paper (It can't be newspaper. It needs to be thicker – like printer paper or writing paper.)
- Scissors
- Kitchen tongs that can withstand flames
- A pot that is at least 6 inches deep
- A stove, preferably with a vent
- Water
- Hydrogen peroxide (It is sold in drug stores to clean wounds.)
- A potato (You only need two slices.)
- Two small glasses, like juice glasses
- A sharp knife
- Ice
- Food coloring (It needs to be liquid – not a gel.)
- A large glass
- Two large bowls
- A pot for boiling
- A stove
- A strainer or colander
- An uncooked chicken part that has both meat and skin on it (A breast or thigh is best, because they are large.)
- A 9-volt battery
- Aluminum foil
- Cellophane tape
- A tablespoon
- Two plastic ½-liter bottles, like the kind water comes in
- A carbonated drink (such as Coke, Diet Coke, Pepsi, Diet Pepsi, etc)
- Two balloons
- A box of gobstoppers (For best results, it should be a box of Willy Wonka's Everlasting Gobstoppers).
- A plate with a depression that will hold a thin layer of water
- A container that will pour water smoothly
- A box of gumdrops that has at least four different colors
- Toothpicks
- Two large, clean plates
- An uncooked egg
- A Ziploc bag
- Four shiny pennies (You can clean old pennies by soaking them in a solution of vinegar and salt. You want these pennies to look as new and shiny as possible.)
- A pot for boiling an egg
- Two large glasses (They need to be transparent and able to hold hot water.)
- Water
- Ice
- Matches
- A penny that was minted after 1983 (If you don't have access to a U.S. penny, a very recently-minted copper coin from another country should work.)

- A toilet bowl cleaner whose active ingredient is hydrochloric acid, also known as hydrogen chloride (Four brands that have been tested are "The Works," "Home Sense," "Kaboom Bowl Blaster," and "Lysol." Those brands do make other toilet bowl cleaners, however, so you have to look at the ingredients and find hydrochloric acid or hydrogen chloride. Most brands have the chemical listed on the front of the bottle, but "Kaboom Bowl Blaster" has it on the back. If the cleaner says it contains bleach or hydrogen peroxide, it will not work.
- A toilet
- Paper towels
- A metal file
- A pot or tea kettle for boiling (Ideally, you should be able to pour water from it easily.)
- A metal pie pan
- A stove

Supplies for Science at the Turn of the 19th Century (Lessons 76-90)

- Two ½-liter plastic bottles, like the kind water comes in
- A can of carbonated drink (like Coke) that contains less than half a liter (standard, 12-ounce cans work)
- A flashlight
- Construction paper (Black is best, but any dark color will work.)
- Scissors
- Cellophane tape
- 2 magnifying glasses of different strengths (They need to be as large or larger than the face of the flashlight.)
- A ruler
- A dim room with a white wall on one side (If you don't have a white wall, just have a helper hold a blank, white sheet of paper against the wall and shine the flashlight onto the paper.)
- A feather (It can be a natural feather or an artificial one, but please note that many natural feathers are actually illegal to have, even if you just pick them up from the ground. Duck and goose feathers are the safest to use if you use natural feathers. Artificial feathers can be purchased at any hobby store. You want a feather in which at least part of the feather is flat and not fuzzy, and the lighter the color, the better. See the picture on page 239.)
- A lamp with a bare bulb (Just remove the shade from a table lamp.)
- Liquid hand soap
- A sink with a working faucet in a well-lit room
- Two sheets of unlined white paper
- A bright red marker or crayon
- A stopwatch or a watch with a second hand
- A balloon
- A dark room
- A metal spoon
- Three glasses that are completely clear and as close to identical as possible
- Red food coloring
- Blue food coloring
- Water
- A spoon for stirring
- Cardboard

- Duct tape or black tape
- Plain white paper
- Glue that dries clear
- Pepper
- Two magnets of different strengths
- A metal paper clip
- A ruler
- Sprite (Any clear carbonated drink will work, but it needs to be in a bottle with a screw cap.)
- Red (sometimes called purple) cabbage
- A pot for boiling
- Three small glasses, like juice glasses
- A ¼-cup measuring cup
- A ¼-teaspoon measuring spoon
- Two bowls
- A stove
- A deep bowl or pot (Ideally, it should be as deep as a water bottle is tall.)
- Ice
- A large spoon for stirring
- A sink with a faucet that can produce hot water
- Play-Doh or other modeling clay
- A rolling pin
- A ball-point pen (You can use one that has no ink if one is available.)
- Borax (This is sold in supermarkets next to the laundry detergents as a detergent booster. 20 Mule Team Borax is a popular brand.)
- A measuring tablespoon
- A measuring cup for liquids (It should have a pouring spout on it.)
- A short length of string
- A 9-volt battery
- White vinegar
- A tall glass
- A penny (Any copper coin will work.)
- A nickel (Any coin that looks silver but isn't really silver will work.)
- Aluminum foil
- Root Kill (Sold at hardware stores to kill roots that get into underground pipes.)
- Scissors
- Tape