

# APPENDIX C

## Experiment Supplies by Chapter

Supplies in black are considered household items.

Supplies in blue are part of the microscope kit that is made for this course.

Supplies in red are part of the dissection kit that is made for this course.

### Chapter 1:

You can do all experiments in this chapter without either kit.

- A large strawberry, two small strawberries, or a banana
- A large plastic bag that zips shut
- Three small glasses, like juice glasses
- A  $\frac{1}{4}$ -cup measuring cup
- A  $\frac{1}{3}$ -cup measuring cup
- A  $\frac{1}{2}$ -cup measuring cup
- A 1-teaspoon measuring spoon
- A  $\frac{1}{4}$ -teaspoon measuring spoon
- A measuring teaspoon
- A spoon for stirring
- A wood rod for stirring, like a bamboo skewer
- A strainer
- Salt
- Dish soap
- Rubbing alcohol
- A freezer
- Hydrogen peroxide (Sold at drug stores to clean wounds.)
- Yeast (Any yeast used for baking, even bread machine yeast, will work.)
- A sink

### Chapter 2:

If you didn't get the microscope kit, you can still do Experiment 2.1, since you can purchase iodine (a brown liquid used for treating wounds) and a medicine dropper at a drug store.

- A sheet of writing paper or printing paper
- A paper towel
- Wax paper or a plastic sandwich bag
- A facial tissue
- Scissors
- Tape
- A pencil or pen
- A tall, clear glass
- Water
- Food coloring
- Iodine
- A medicine dropper

- A paper or plastic plate
- Flour
- A potato
- Sugar
- A slice of banana or apple
- A marshmallow and a knife (optional, but very interesting)
- A measuring  $\frac{1}{4}$ - teaspoon
- Hydrogen peroxide (Sold in drug stores for cleaning wounds.)
- Vinegar
- Three small glasses, like juice glasses
- Two mugs used for hot beverages
- A microwave (If you don't have a microwave, use a small pot and a stove. You will also need only one mug.)
- A sharp knife
- A fork

### Chapter 3:

Without the microscope kit, you can only perform Experiment 3.3

- Microscope
- Blank microscope slides
- Slide coverslips
- Iodine
- Two medicine droppers
- Thread or very thin string
- Tweezers
- An onion
- A paring knife
- Prepared slide: Leaf c.s. with vein
- Prepared slide: *Ascaris* mitosis
- Water
- Two gummy bears (or any two similar candies of the same size.)
- Two small glasses, like juice glasses

### Chapter 4:

You cannot do either of the experiments in this chapter without the microscope kit.

- Microscope
- A blank microscope slide
- Slide coverslips
- Methylene blue
- Prepared slide: *Ascaris* Mitosis
- Prepared slide: Onion Tip Root
- Baker's yeast (Available at any supermarket.)
- Water
- Sugar

- A small glass, like a juice glass
- A measuring tablespoon
- A  $\frac{1}{3}$ -cup measuring cup
- A paper towel
- Two medicine droppers

### Chapter 5:

You can do Experiment 15.1 without either kit. You cannot do Experiment 15.2 without the dissection kit.

- 18 small objects (like candies, beads, or coins) of one color, and 12 of another color (We used 18 blue M&Ms and 12 red M&Ms.)
- Two containers (like bowls) that are not transparent
- A table and a chair you can use to sit at the table
- Several books that you can stack to elevate the bowls so you cannot see what is inside
- **PTC paper strips**
- Your siblings and parents (Including uncles, aunts, and grandparents would be great, if possible.)
- White paper (It doesn't matter whether or not it has lines.)
- Scissors

### Chapter 6:

You cannot do the experiment in this chapter without the microscope kit.

- Microscope
- Prepared slide: *Zea mays* (corn) Stem c.s.

### Chapter 7:

Even though Experiment 7.1 is done to make samples for Experiment 7.2 (which requires the microscope kit), you can still do Experiment 7.1 if you don't have the microscope kit. Then, do the first two steps of Experiment 7.2 to see the effect that the bacteria have on the appearance of the cultures.

- A beef bouillon cube (or its equivalent)
- A 1-cup measuring cup
- A  $\frac{1}{2}$ -cup measuring cup
- Two small glasses, like juice glasses
- A pan that can boil at least four cups of water
- A wooden spoon
- Plastic wrap
- A stove
- Water
- A sink
- Gloves (like cleaning gloves)
- Paper towels
- Microscope
- Blank microscope slides

- Coverslips
- Methylene blue
- Lens paper
- Two medicine droppers

### Chapter 8:

Even though Experiment 8.1 is done to make samples for Experiment 8.3 (which requires the microscope kit), you can still do Experiment 8.1 and then examine the fungi to note their characteristics. If you have a magnifying glass, that would make it even better. The tweezers and knife are for Experiment 8.3, but they don't have to come from the dissection kit. Household tweezers and a sharp knife from the cutlery will be fine.

- About half a slice of bread
- Two pieces of two different fruits (apple, cherry, tomato, etc.) that include the fleshy interior
- A small amount of cheese (Don't use processed cheese.)
- A large plate
- A room that stays dark and cool most of the time (a seldom-used closet, for example)
- Water
- Microscope
- Prepared slide: *Paramecium*
- Prepared slide: *Amoeba Proteus*
- Prepared slide: Diatoms
- Prepared slide: *Euglena*
- Prepared slide: *Volvox*
- Prepared slide: *Spirogyra*
- Blank microscope slides and coverslips
- Paper towels
- Medicine dropper
- A small glass or cup of water
- Tweezers
- A knife

### Chapter 9:

You cannot do Experiment 9.1 without the microscope kit, and you cannot do the other two experiments without the dissection kit.

- Microscope
- Prepared slide: Hydra budding
- Prepared slide: Planarian, w.m.
- Earthworm specimen
- Crayfish specimen
- Dissection tools
- Dissection tray
- Magnifying glass (optional)

**Chapter 10:**

You cannot do either experiment in this chapter without the dissection kit.

- Perch specimen
- Frog specimen
- Dissection tools
- Dissection tray

**Chapter 11:**

While Experiment 11.1 calls for dissection tools, you can use any household item that is made of metal and ends in a sharp point. While Experiment 11.2 calls for a feather that is in the dissection kit and dissection tools, you can get a feather from outside (mind the warning given in the experiment) and use household tools to open up the shaft of the feather. Also, you can use a magnifying glass instead of a microscope.

- A chicken egg (You might need a second one if something goes wrong.)
- Dissection tools
- A spoon
- A hard plate (not a paper plate)
- A well-lit room
- A feather
- Microscope
- A blank microscope slide and a coverslip
- A medicine dropper
- A small glass of water

**Chapter 12:**

You cannot do Experiment 12.2 without the microscope kit. Experiment 12.3 can be done if you purchase iodine (a brown liquid used to treat wounds) from a drug store.

- Microscope
- Microscope slides
- Coverslips
- Methylene blue
- Medicine dropper
- Iodine
- A ruler
- A clear baking pan
- Something soft to throw, like a beanbag or nerf ball (It will hit the pan, so it needs to be soft.)
- A lighter or a match
- A pin that has a sharp point
- Paper towel
- Two Ziploc bags (The “snack” size is best, but “sandwich” size will work.)
- Cornstarch
- Water
- A ½-teaspoon measuring spoon (Plastic is ideal, but metal will work.)
- Two bowls that hold about 2 cups of liquid

- Two spoons
- Twist tie or piece of string

### Chapter 13:

You can do part of Experiment 13.1 without the dissection kit. Just use household items to take it apart and don't do the microscope part of the experiment. You cannot do Experiment 13.2 or Experiment 13.3 without the microscope kit.

- A flower (You can find one in nature, but there are protected areas where flowers cannot be picked. You can buy an inexpensive one at a large supermarket or ask a flower shop for one that they are throwing away. Make sure when you look at the flower you see both a central stalk (the pistil) and other stalks with knobs on the end (the stamen). That ensures you have a flower with both male and female parts. If you can get more than one type of flower, that would be even better!)
- **Dissecting tools**
- **Dissecting pan**
- Microscope
- Blank slide
- Coverslip
- Medicine dropper
- Prepared Slide: Onion Tip Root
- Prepared Slide: Zea Mays Root C.S.
- Prepared Slide: Zea Mays stem C.S.
- Prepared Slide: Ranunculus Root C.S.
- Prepared Slide: Ranunculus stem C.S.
- Prepared Slide: Leaf C.S. w/Vein
- Water

### Chapter 14:

You can do both of the experiments in this chapter without either of the kits.

- Several dried beans (The kind you soak before cooking, such as kidney, lima, pinto, or navy beans)
- Water
- Paper towels
- A glass jar with the lid removed
- A Styrofoam or paper cup and a saucer that is not paper or Styrofoam that the cup can sit on
- Scissors
- Soil
- A cardboard box that can cover the cup with something sticking out several inches above the cup
- Three stalks of celery with some of the leaves still on them (They don't need a lot of leaves.)
- Three small glasses, like juice glasses, that are all the same size
- A spoon
- A sharp knife
- A small plastic sandwich bag
- Cellophane tape
- Blue food coloring (Blue is the color that shows up best.)
- A fan

**Chapter 15:**

You can do Experiment 15.1 without either kit. You can also do Experiment 15.2, but you will need to put the petroleum jelly on glasses. Use clear plastic wrap instead of a coverslip in step 2, and just set the outside glass on the ground in step 7. Don't use tape in that step. Then, examine the samples with a magnifying glass instead of a microscope.

- A ½-liter plastic bottle, like the kind water comes in, with its screw cap (It needs to be a thin-walled bottle, because you need to be able to crush part of it while its cap is on.)
- Rubbing alcohol
- Microscope
- At least three blank microscope slides (more if you want to do more investigation)
- A coverslip for each slide
- A cotton swab or paintbrush
- Petroleum jelly (like Vaseline)
- Strong tape like packing tape or duct tape
- Two 2-liter bottles, like the ones soft drinks come
- Baking soda
- Vinegar
- Water
- A small amount of aluminum foil
- A thermometer that can read from room temperature to the boiling point of water, like a candy thermometer, meat thermometer, or a thermometer used in chemistry experiments
- A pot and stove or a microwave and mug that you can use to boil the water.
- A 1-cup measuring cup
- A ¼-teaspoon measuring spoon
- A stopwatch or other timing mechanism that can read down to at least seconds

**Chapter 16:**

You can do Experiment 16.1 without a kit, and you can even collect the samples and put them in a sunny spot indoors. Rather than examining their contents with a microscope, just use a magnifying glass. You won't see microscopic organisms, but you still might see something interesting.

- A pond, lake, or ocean
- Colored pencils or some other art supplies you can use to make drawings in your notebook
- Two jars (with lids)
- A long-handled spoon or dipper
- A sunny spot indoors
- Microscope
- Blank microscope slides
- Coverslips
- Two medicine droppers
- Paper towels