

**Scott Foresman**  
**SCIENCE**

**Grade 3**

**Equipment Kit  
Guide**

**Unit B**  
Physical Science

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# Contents

<b>Equipment Kits and Teacher’s Guide</b> .....	<b>i</b>
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## **Activity Notes for Unit B Physical Science**

Exploring Properties of Matter (B6).....	<b>1</b>
Estimating and Measuring Mass (B14–B15).....	<b>1</b>
Changing States of Matter (B20–B21).....	<b>2</b>
Experimenting with a Chemical Change (B25–B27).....	<b>3</b>
Exploring the Motion of a Ball (B32).....	<b>3</b>
Investigating Magnetic Force (B42–B43).....	<b>4</b>
Lifting Objects with a Lever (B52–B53).....	<b>5</b>
Exploring Forms of Energy (B58).....	<b>5</b>
Making a Thermometer (B68–B69).....	<b>6</b>
Making an Electric Circuit (B80–B81).....	<b>7</b>
Exploring Sound (B86).....	<b>8</b>
Changing Pitch (B92–B93).....	<b>8</b>
Listening to Sound Through Matter (B98–B99).....	<b>9</b>

# Equipment Kits and Teacher's Guide

## Equipment Kit Management

### About Your Kits

The equipment in *Scott Foresman Science* is packaged in sturdy plastic bins for your convenience. The quantities included support eight groups of four students each.

### Unit Kit/ Grade Level Kit

The Unit Kit contains most of the items you will need to conduct hands-on activities with your students. Equipment for each unit is contained in one or two bins. The Unit Kit is designed to be purchased separately. Each bin is clearly labeled with the grade level, bin number, unit name, and contents. A label inside the lid of each bin references the materials by activity. Only activities requiring kit items are listed.

Unit Kits are also available in a Grade Level Kit configuration. In this format, a common bin eliminates items duplicated across the units for cost savings and convenience.

### Demonstration Kit

The Demonstration Kit gives teachers the opportunity to rehearse activities before conducting them in the classroom. Kit-provided materials for each activity are pre-packaged and labeled for easy identification. When used in conjunction with the activity videos, the demonstration kits make it easy to prepare and conduct all investigations and experiments.

### Storage of the Kits

Your equipment is packaged in sturdy, translucent plastic bins and labeled for easy storage and access. Bins may be stacked or stored on shelves or carts. Bins are labeled on all sides for quick identification and location of items. This provides convenient organization of materials before and after use.

### Replacement Materials

Use the Packing List/Replacement Parts Price List to reorder items as needed for the Unit Kit or Grade Level Kit. These order forms are packed in the plastic bins and can be photocopied. Each list provides a column for entering the quantities of items you need to replace. Materials are organized alphabetically and identified as consumable or nonconsumable.

Complete consumable Replacement Kits are available as well. These kits replenish all the consumable materials for each Unit Kit or Grade Level Kit.

### Using the Teacher's Guide

This guide will help you better prepare to conduct the program activities in your classroom. Reviewing the guide while practicing with the activity video and demonstration kit or simply reading the guide upon receiving your classroom kit will make it easy to facilitate an activity with your students.

## **Getting Started**

Familiarize yourself with the kit contents. To make sure your shipment is complete, check the packing statement provided with your kit.

## **Activity Notes**

The Activity Notes in this guide provide comprehensive information to make your activity sessions a success. This information may include:

### **Video Segment**

The video segment number is indicated to help you cue the tape to each Investigate and Experiment activity.

### **Materials**

A materials list for each activity identifies kit-supplied and school-supplied materials. Use this list as a check of your kit contents and as a list for class preparation.

### **Material Substitutions**

For increased flexibility, material substitutions, when appropriate, are indicated.

## **Advance Prep**

These instructions offer preparation guidance as necessary. With these suggestions, you will always be well prepared to conduct activities in your class.

## **Hints and Tips**

Detailed hints and tips help to ensure student success in the classroom. Notes range from how to enhance students' success to increasing your understanding of activity concepts.

## **Safety Notes**

While safety should be practiced at all times for each activity, it may be necessary to consider specific activity concerns. These notes give activity-specific safety tips.

## **Additional Comments**

This section provides extension ideas, alternate activities, and other helpful information.

## Exploring Properties of Matter

*Explore Activity (B6)*

### Materials (per group)

Kit Items	School-Supplied Items
4 empty resealable plastic bags	water rock

### Material Substitutions

Other liquids and solids may be used in this activity.

### Advance Prep

Fill a plastic bag about 1/4 full with water, seal the bag, place it inside a second bag, and seal again.

### Hints and Tips

- Be sure the water or other liquid is double-bagged and sealed completely.
- Check to see that the bags do not leak.

### Safety Note

Remind students to wipe up any spills immediately.

### Additional Comments

As an extension, you may wish to prepare separate “bags of air,” adding several drops of mint, lemon, vanilla, or other extract to each bag before sealing. Have students open and squeeze the bags, releasing the odor. The odor will spread throughout the room as the air from the bag escapes.

## Estimating and Measuring Mass

*Investigate Activity (B14–B15)*

### Video Segment 1

### Materials (per group)

Kit Items	School-Supplied Items
interlocking gram cubes 2 plastic cups, 10 oz balance	pencil eraser paper clip piece of chalk masking tape (4 small pieces, about 8 cm each)

### Material Substitutions

Other small objects may be substituted for the materials to be measured.

### Hints and Tips

- Students should make sure the balance is level when the cups are empty before beginning the activity.
- Students should join 12 gram cubes together in any shape they choose, as long as it will fit in the cup on the balance. This will be one of the objects they estimate and measure for mass.

### Additional Comments

You may wish to do similar activities on a regular basis. Students may monitor their progress as their estimations improve with practice. This activity may be extended to metric estimations and measurement of length and volume.

# Changing States of Matter

*Investigate Activity (B20–B21)*

## Video Segment 2

### Materials (per group)

Kit Items	School-Supplied Items
2 plastic jars with lids, 16 oz measuring cup blue food coloring	large ice cube water paper towel

### Advance Prep

Prepare large ice cubes.

### Hints and Tips

- Make sure students tighten jar lids securely.
- The amount of time it takes for the moisture to appear will vary depending on the relative humidity of the room.

### Safety Note

Remind students to clean up all spills immediately.

### Additional Comments

You may wish to use ice pieces of different shapes to emphasize the fact that a solid maintains its shape. Aluminum foil can be used to prepare molds for ice of different shapes.

# Experimenting with a Chemical Change

*Experiment Activity (B25–B27)*

## Video Segment 3

### Materials (per group)

Kit Items	School-Supplied Items
measuring cup 3 plastic cups, 10 oz 3 antacid tablets resealable plastic bag grid paper	safety goggles water (room temperature) clock with a second hand metal spoon

### Material Substitutions

Effervescent candy tablets or bath tablets may be used in place of antacid tablets.

### Advance Prep

Allow the water to stand for several hours, until it is at room temperature.

### Hints and Tips

- Be sure to explain that to “completely break down” means that the tablet is completely gone, and there is no more “fizzing.” There may still be some residue at the bottom of the cup.
- When using the tablet broken into four pieces, the pieces do not have to be exactly the same size but should be similar in size.

### Safety Notes

- Remind students to clean up all spills immediately.
- Remind students not to drink the liquid or eat any of the antacid.

### Additional Comments

You may wish to combine the data from all groups for more accurate data collection. Any group with data that is very different from the class data may wish to repeat the experiment. This would be a good opportunity to discuss the necessity of repeating experiments to obtain more reliable results.

# Exploring the Motion of a Ball

*Explore Activity (B32)*

### Materials (per group)

Kit Items	School-Supplied Items
half-meter stick styrene (plastic-foam) ball	masking tape (2 strips, 30 cm each; 1 strip, 1 m) wall

### Material Substitutions

If using a different type of ball, be sure it is made of material that will not be harmful if the ball accidentally strikes a student.

### Additional Comments

This activity can be expanded by having students bounce the ball off the wall at different angles and with different amounts of force in an attempt to get the ball close to the target.

# Investigating Magnetic Force

*Investigate Activity (B42–B43)*

## Video Segment 4

### Materials (per group)

Kit Items	School-Supplied Items
thread (about 30 cm) modeling clay donut magnet aluminum foil (8 cm square) acetate sheet (clear plastic sheet, 8 cm square)	paper clip (small) paper steel spoon

### Advance Prep

Cut the thread to 30 cm lengths. Cut the paper, plastic sheet, and aluminum foil into squares measuring 8 cm.

### Hints and Tips

- If your students have trouble holding the paper clip very still and near the magnet, have them tape the thread to the surface of the desk and move the magnet and the clay so that the paper clip is suspended.
- When students place the metal spoon between the magnet and paper clip, they may find that the spoon is attracted to the magnet. Have students brace their elbows on the table to keep the spoon from touching the magnet. Students should avoid touching the spoon to the magnet so the spoon does not become magnetized.

### Additional Comments

A fun extension to this activity is to have students fasten the magnet inside the cover of a jar (use glue to attach the magnet if the lid is plastic and the magnet does not have to be reused). Use modeling clay to affix the string attached to the paper clip to the bottom of the jar. Adjust the length of the string so that the paper clip does not quite reach the top of the jar, then replace the lid. Turn the jar over, then slowly turn it right-side-up. If the string is the proper length, the paper clip seems to hover in midair. Students could cut small pieces of tissue paper and attach them to the clips to make their own “flying insects.”

## Lifting Objects with a Lever

*Investigate Activity (B52–B53)*

### Video Segment 5

#### Materials (per group)

Kit Items	School-Supplied Items
2 plastic cups, 10 oz half-meter stick marble interlocking gram cubes	masking tape 3 pencils

#### Material Substitutions

You may wish to use other small objects in place of marbles.

#### Hints and Tips

The position of the marble in the cup may influence the results slightly.

#### Additional Comments

You may extend this activity by having students repeat the procedure using objects of different sizes. Objects could be formed with modeling clay. Students may also place the fulcrum in different places along the lever. Students should collect data and look for patterns in the number of gram cubes used to lift objects as the position of the fulcrum is changed.

## Exploring Forms of Energy

*Explore Activity (B58)*

#### Materials (per group)

Kit Items	School-Supplied Items
flashlight 2 D-cell batteries	none

#### Advance Prep

Check to see that the batteries and flashlights are operating properly.

#### Hints and Tips

If students cannot feel the heat from the bulb, you may wish to remove the clear covers from the flashlights.

#### Additional Comments

You may wish to have students use a hand lens to examine the filament in the bulb. When electricity flows through the filament in the bulb, the filament becomes hot and glows brightly. Ask students for other examples of material that glows when it is heated (charcoal in a barbecue, glowing embers in a fire, lava from a volcano, etc.).

# Making a Thermometer

*Investigate Activity (B68–B69)*

## Video Segment 6

### Materials (per group)

Kit Items	School-Supplied Items
funnel red food coloring clear plastic straw modeling clay	plastic bottle, 20 oz container of room-temperature water container of warm water container of cold water metric ruler

### Material Substitutions

16 oz plastic bottles may be used in place of 20 oz bottles.

### Advance Prep

Allow water to stand for several hours until it is at room temperature.

### Hints and Tips

- Put clay around the straw to seal the top of the bottle. There must be a tight seal between the straw and the clay, and between the lip of the bottle opening and the clay.
- You may wish to add ice to the cold water for more dramatic results.
- Do not allow the thermometers to stand in the sun or near a heat source. The water may overflow from the end of the straw.
- Be sure students understand that not only the water expands and contracts in the thermometers, but the air above the water also expands and contracts, changing the water level in the straw.

### Safety Note

Remind students to wipe up any spills immediately.

### Additional Comments

Students could add ice to the cold water for more dramatic results.

# Making an Electric Circuit

*Investigate Activity (B80–B81)*

## Video Segment 7

### Materials (per group)

Kit Items	School-Supplied Items
piece of aluminum foil D-cell battery spring-type clothespin flashlight bulb (miniature lamp #14)	safety goggles scissors masking tape

### Advance Prep

For each group, cut pieces of aluminum foil that are 60 cm x 30 cm. Check to see that the batteries and bulbs are functioning.

### Hints and Tips

If the bulb does not light, check to see that no parts of the two aluminum strips are touching, causing a short circuit. Make sure the foil ends are attached securely to the battery terminals.

### Safety Notes

- Remind students to be careful when folding and handling foil strips. There may be sharp edges.
- Caution students to disconnect the circuit if any part of the circuit becomes warm.

### Additional Comments

You may wish to discuss what happens in a short circuit, and have students demonstrate this with their circuits. If any parts of the two aluminum foil strips touch, the electricity does not flow through the bulb, and the bulb will not light. Students could insulate the foil by placing masking tape over the foil while leaving the ends exposed.

## Exploring Sound

*Explore Activity (B86)*

### Materials (per group)

Kit Items	School-Supplied Items
plastic wrap salt half-meter stick rubber band (#33)	safety goggles soup can, 16–24 oz baking tray cardboard tube (toilet paper or paper towel roll)

### Material Substitutions

Other sound-producing objects, such as toy drums, bells and other small musical instruments, may be used.

### Advance Prep

For each group of students, cut a piece of plastic wrap large enough to cover one end of a soup can.

### Hints and Tips

- This activity requires students to make some noise, so be sure to do this in an area where others will not be disturbed.
- Be sure students are not blowing directly on the surface of the plastic wrap.

### Safety Notes

- Remind students to handle the rubber bands carefully so the bands do not snap or break.
- Remind students to use the cardboard tubes properly, never pointing them toward other students' ears when making sounds through the tubes.

### Additional Comments

Students may try placing their sound detectors near the speaker of a radio or other sound source. They may try to see how different pitches and volumes of sounds affect the salt on the plastic wrap.

## Changing Pitch

*Investigate Activity (B92–B93)*

### Video Segment 8

### Materials (per group)

Kit Items	School-Supplied Items
rubber band (#63) rubber band (#64) half-meter stick	safety goggles facial tissue box 2 pencils

### Hints and Tips

Students may need to move the pencils back and forth between the two positions to double check their observations.

### Safety Note

Remind students to handle the rubber bands carefully so the bands do not snap or break.

### Additional Comments

You may wish to extend this activity by challenging students to find a way to play a simple tune using one or more of the sound boxes.

# Listening to Sound Through Matter

*Investigate Activity (B98–B99)*

## Video Segment 9

### Materials (per group)

Kit Items	School-Supplied Items
half-meter stick wood block (about 8 cm x 10 cm x 2 cm)	metric ruler penny

### Hints and Tips

Students may need to repeat the procedure to double check their observations.

### Additional Comments

You may have students repeat the activity on other types of surfaces.