Activity Lab Book
### Contents

#### LIFE SCIENCE

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Life Cycles</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Life Cycles of Animals</td>
<td>21</td>
</tr>
</tbody>
</table>

#### EARTH SCIENCE

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Earth’s Materials</td>
<td>41</td>
</tr>
<tr>
<td>4</td>
<td>Earth’s Past</td>
<td>57</td>
</tr>
<tr>
<td>5</td>
<td>Earth’s Resources</td>
<td>73</td>
</tr>
</tbody>
</table>

#### PHYSICAL SCIENCE

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Objects in Motion</td>
<td>89</td>
</tr>
<tr>
<td>7</td>
<td>Forces at Work</td>
<td>109</td>
</tr>
</tbody>
</table>

#### Everyday Science Activities

- 129

#### Learning Labs

- 145

---

California science standards are noted at the top of activity pages. For the text of the standards, please refer to the Reference section of the California Science Student Edition.
How are leaves alike and different?

What to Do

1) **Observe.** Use a hand lens to observe leaves.

2) **Communicate.** Draw pictures of what you see in the box below. What questions do you have?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

You need

- hand lens
- leaves
3 Compare. How are the leaves alike and different?

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

Explore More

4 Classify. Sort the leaves into groups. Draw and label each group you made in the box below.
Which leaf do you have?

In this activity, you will discuss and compare six different leaves.

What to Do

1. Write four words that tell about your leaf.

2. Find a classmate with the same kind of leaf as yours. How did you find people with the same kind of leaf as yours?

3. Find a classmate with a different kind of leaf than the one you have. How is your leaf different from your classmate’s leaf?
What are the parts of plants?

What to Do

1. Separate your plant from the soil. Look for the roots.

2. Observe. Look at the different parts of the plant. What parts can you see?

   ____________________________________________________________________

   ____________________________________________________________________

You need

- plants with flowers
- hand lens

3. Communicate. Draw a picture of the plant on a separate piece of paper. Label the parts that you see.

What Did You Find Out?

4. Infer. Why are there no fruits or seeds?

   ____________________________________________________________________

5. Predict. Where do you think the fruit and seeds will be?

   ____________________________________________________________________
Observe

To observe, you use your senses to find out about something. You use senses to see, feel, hear, smell, and taste.

Learn It

You can use some of your senses to learn about flowers. You can write what you observe in a chart.

jasmine

<table>
<thead>
<tr>
<th>See</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>feel</td>
<td>The leaves are smooth.</td>
</tr>
<tr>
<td>hear</td>
<td></td>
</tr>
<tr>
<td>smell</td>
<td>The flowers smell good.</td>
</tr>
</tbody>
</table>
Try It
Find a flower to observe or look at the pictures below.

1. What color is your flower? Which sense did you use to find out?

2. How do you think the leaves feel?

3. Write About It. Find another flower and compare.
What are the parts of a seed?

What to Do

1. **Observe.** Look at the dry lima bean. What does it feel like?

2. **Observe.** Look at the wet lima bean. What do you see? What questions do you have about the seeds?

You need
- dry lima bean
- wet lima bean
- hand lens
3 Use your fingernail to open the wet lima bean. Use a hand lens to look inside. Draw a picture of what you see in the box below.

4 Communicate. How did the water change the bean?

Explore More

5 Predict. Do other kinds of beans look the same inside? Try it.
What are the parts of seeds?

In this activity, you will label the parts of a seed.

What to Do

1. Look at the diagram below of the inside and outside of a bean seed.

2. Label the seed coat.

3. Label the area of the seed where food is stored.

4. Label the part of the seed where a new plant will grow.
Quick Lab

What plants grow from seeds?

What to Do

1 Observe. Choose three different seeds. Use your senses to study them closely. Write your observations in the chart below.

<table>
<thead>
<tr>
<th></th>
<th>What Do You See?</th>
<th>What Do You Feel?</th>
<th>What Do You Smell?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed #1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed #2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed #3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 Compare. Look at the pictures of the plants and compare them with the seeds. Can you match the picture of the plant with its seed? Explain.

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

You need

• packets of seeds

Chapter 1 • Plant Life Cycles
Activity Lab Book

Use with Lesson 2
Flowers and Fruits
What will grow from a seed?

What to Do

1. Use toothpicks to hold your seed in a cup of water.

You need
- toothpicks
- avocado seed
- cup

2. Observe. Watch how your plant grows. Remember to add water so that the bottom of the seed is always in water.
3) Draw pictures of your plant as it grows in the box below. What plant part grew first? What other parts did your seed grow?

________________________________________

________________________________________

________________________________________

Explore More

4) Predict. How will your plant change as it grows?

________________________________________

________________________________________

________________________________________
How are young and adult plants alike?

What to Do

1. **Compare.** Look at the picture of a young apple tree and the picture of an older apple tree.

2. How are the young apple tree and the older apple tree alike? How are they different?

You need

- pictures of a young apple tree and an older apple tree
- 1 apple, cut in half
- hand lens

3. **Observe.** Look at the apple that has been cut in half. Use a hand lens. What do you think these seeds will grow to look like?
What is the order of a life cycle?

What to Do

1. **Observe.** Look at the different parts of a tree’s life cycle in the pictures below.

   ![First Picture](image1)
   ![Second Picture](image2)
   ![Third Picture](image3)

   ________   ________   ________
   ________   ________   ________
   ________   ________   ________

2. **Sequence.** Cut out the pictures with the lines. Put them in the correct life cycle order. Glue the pictures with the lines to construction paper.

3. **Communicate.** On the lines under each picture, write a sentence to tell about each picture.

---

You need

- construction paper
- glue

© Macmillan/McGraw-Hill
How are wildflowers alike and different?

What to Do

1. **Classify.** Sort the seeds to find ones that look alike. Put the different types of seeds in an egg carton. Pick three different types. You will need 2 or 3 seeds of each type.

2. **Number the cups.** Fill the cups with soil. Plant one type of seed in each cup.

You need:

- mixed wildflower seeds
- egg carton
- 3 cups
- soil
3 Water the seeds. Put the seeds in a sunny place.

4 Observe. Watch your seeds as they grow. Record what you see every day. Make a chart like the one below. How long do the seeds take to sprout? What shapes are the leaves? How are the flowers alike and different?

Investigate More

Use the library or the Internet to find out the names of the plants you grew.
How do roots grow?

What to Do

1. Put a bean seed on a damp paper towel. Put it in the bag and tape it to a window.

2. **Observe.** Watch the seed as it grows. Which part grows first? Which way do the roots grow?

3. After the roots have started to grow, turn the bag upside down. Tape it to the window again. Make sure the paper towel stays wet.

You need

- bean seed
- paper towel
- plastic bag
- tape
- hand lens
Explore More

Communicate. Draw what happened to the roots in the box below.
What makes seeds grow down?

What to Do

Observe the roots that grow from bean seeds.

1. Place 4 beans in a plastic bag. Turn the beans in different directions. Put a moist paper towel in the bag with the beans.

2. Look at the bean seeds every day until the roots begin to grow.

3. Discuss how the beans change each day.

What Did You Find Out?

1. How did the roots of each seed grow?
   
   ____________________________________________
   
   ____________________________________________

2. How do you think the roots know which way is down?
   
   ____________________________________________

3. Why do roots grow down?
   
   ____________________________________________

You need

- 4 bean seeds
- plastic bag
- moist paper towel

Chapter 1 • Plant Life Cycles
Activity Lab Book

© Macmillan/McGraw-Hill

Use with Lesson 4
Plants and Their Environments
Do plants grow toward light?

1 Put one plant in the shoebox on the end away from the hole. Tightly close the box. Make sure that the only light getting into the box is coming through the hole.

2 Put the box and the other plant on the windowsill. The hole in the box should be facing the light. Only open the box to water the plant.

3 Observe. After one week, look at the plant in the box. Draw what you see on a separate piece of paper.

4 Compare. How is the plant in the box different from the plant not in the box?__________________________

5 Why did it change to fit its new environment?__________________________
How can we put animals into groups?

What to Do

Classify. Make a list of ten animals. Put your animals into groups. What groups did you use?

Sea Turtle

Seagull

Dolphin

Sea Otter

Lobster
Explore

1 Talk about your animal groups with a partner. What groups did your partner use?


3 Compare. How are your groups and your partner’s groups alike? How are they different?


Explore More

4 Infer. Why do you think scientists put animals into groups?


What labels could I give my groups of animals?

In this activity, you will group animals that are alike.

What to Do

1 Look at the list of animals that your teacher has written. Think about how each animal moves. What do they look like? Where do they live?

2 How can you decide how to name each group?

What Did You Find Out?

3 Compare the way that you named the groups with other pairs of classmates. How are your names the same? How are they different?
Quick Lab

Match the skin to the animal

What to Do

1 **Observe.** Look at the “animal skin” mats and the animal pictures.

2 **Classify.** What animals have you touched? What did they feel like?

You need

- “animal skin” mats
- animal pictures

3 **Infer.** Match a picture of an animal to an “animal skin” mat. How did you match the “animal skin” mat with each animal? Use the chart below. Check a box for each picture.

<table>
<thead>
<tr>
<th>Animal Picture</th>
<th>Feathers</th>
<th>Fur</th>
<th>Scales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Communicate

To communicate you share your ideas with others.

Learn It

You can use a chart to communicate what you learned.

<table>
<thead>
<tr>
<th>Different Animals</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammals</td>
<td>Reptiles</td>
<td>Birds</td>
</tr>
<tr>
<td>horse</td>
<td>lizard</td>
<td>eagle</td>
</tr>
<tr>
<td>mouse</td>
<td>turtle</td>
<td>sparrow</td>
</tr>
</tbody>
</table>

Try It

Use a chart like the one above to classify the animals below. Add other animals to your chart. Then share your chart with a partner.

lamb  penguin  iguana  snake  guinea pig  parrot
1. How are mammals and birds alike? How are they different?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

2. What are some ways you can classify the animals?

__________________________________________________________________________

__________________________________________________________________________

3. Write About It. How is your chart different from your partner’s?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
How are babies and adults alike and different?

What to Do

1. What do babies look like? How do they act?

2. What do adults look like? How do they act?
3 Compare. Make a Venn diagram to compare babies and adults.

Babies

Both

Adults

Explore More

4 Compare. How are a baby human and a baby rabbit alike and different?
How are baby and adult mammals alike and different?

In this activity, you will compare baby and adult mammals.

What to Do

1. **Observe.** Look at the pictures that your teacher has on display.

2. How do you know this is a baby elephant?

   ____________________________________________________________

   ____________________________________________________________

What Did You Find Out?

3. How does the adult elephant take care of the baby?

   ____________________________________________________________

   ____________________________________________________________

4. Who takes care of the adult?

   ____________________________________________________________

   ____________________________________________________________
Can you match the adult with its offspring?

What to Do

1. Infer. Work with a partner. Match each picture of an adult animal with the picture of its offspring.

2. Record Data. What animal pairs did you find? List them below.

   __________________________________________
   __________________________________________
   __________________________________________

What Did You Find Out?

3. Compare. Name the parts of the offspring that is like its parent.

   __________________________________________
   __________________________________________
   __________________________________________
How do birds keep their eggs safe?

What to Do

1 Communicate. Discuss with a partner what eggs need to stay safe.

2 Build a nest for an egg.

You need

- twigs
- chenille sticks
- string
3 How did you make things stay in place without using tape?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Explore More

4 Communicate. Look at pictures of real nests. What do animals use to keep their eggs safe?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
How does a bird’s nest help to keep the bird’s eggs safe?

In this activity, you will discuss how nests help birds keep their eggs safe.

What to Do

1. **Observe.** Look at the different bird nests your teacher has displayed. What are some things they are made of?

2. Where might you find a bird nest?

3. How does a nest help protect baby birds? Write two sentences.
Four stages of a butterfly’s life

What to Do

1. **Make a Model.** Look closely at your life cycle card. Make a sketch showing a butterfly at that stage. Make sure you also draw a background.

2. Walk around your classroom and look at the life cycle cards that other classmates have. Try to make a group of four people so that each person has one card that shows a different stage in the life cycle. When you have made your group, sit down together.

What Did You Find Out?

3. **Communicate.** Write the four stages of a butterfly’s life cycle below.

   ____________________________________________

   ____________________________________________

   ____________________________________________

   ____________________________________________
How does a mealworm grow?

Find out how a mealworm grows and changes.

What to Do

1. Put some oatmeal in the container. Poke holes in the lid.

You need

• oatmeal
• container
• hand lens
• mealworm larva
• slice of apple
• ruler

2. Observe. What does a mealworm look like? Place a mealworm and the apple slice in the container.
3 Record Data. Measure your mealworm every two days. Remember to be gentle with the mealworm. Write about how the animal changed in the chart below.

<table>
<thead>
<tr>
<th>Day</th>
<th>Measurement</th>
<th>How It Changed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 Predict. How long do you think your mealworm will grow? How do you think it will change?

Investigate More

Compare. Observe another mealworm. How are they alike and different?
How are these zebras alike and different?

What to Do

1 Observe these zebras.

2 Compare. How are they all alike and different?
3. How do you think stripes help zebras stay safe?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Explore More

4. Compare. Find pictures of another kind of animal with a pattern. Observe how the patterns are alike and different.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
How do animals stay safe?

In this activity, you will find out how animal traits help animals stay safe.

1. **Observe.** Work with a partner. Observe the animal photos.

2. What are some animals that are hard to see in the snow? What traits make them hard to see?

   __________________________________________________________________________

   __________________________________________________________________________

   __________________________________________________________________________

3. What are some animals that are hard to see on a tree branch? What traits make them hard to see?

   __________________________________________________________________________

   __________________________________________________________________________

   __________________________________________________________________________

What Did You Find Out?

4. Choose an animal from the photos. What is another way the animal stays safe?

   __________________________________________________________________________
Same animal, different populations

What to Do

1 **Observe.** Your teacher will show you pictures of gray whales and right whales. You will draw one of the whales on an index card. Use the colored pencils.

2 **Classify.** If you have a right whale, stick your index card on the map in the Atlantic Ocean. If you have a gray whale, stick your index card on the map in the Pacific Ocean.

What Did You Find Out?

3 **Observe.** Look at all the index cards on the map. How many whale populations are on the map?

4 **Compare.** Compare the whales in each population. Do all gray whales look exactly alike? How are they different?
How can we sort rocks?

What to Do

1. **Observe.** Look at your rocks under a hand lens. Describe what you see. How are they alike? How are they different?

You need

- rocks
- hand lens
2 **Classify.** Put your rocks into groups. Write your groups in a chart. Record how many rocks are in each group.

<table>
<thead>
<tr>
<th>Groups of Rocks</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Explore More**

3 **Communicate.** Share your chart with a partner.
Discuss how you put the rocks into groups. What other ways can you classify rocks?
Which rocks look alike?

In this activity, you will discover how to group rocks that are alike.

What to Do

1. Look at the rocks on the picture cards.

2. Put the rocks that look alike together. Label each group with a word that tells how they are alike.

What Did You Find Out?

1. What can you find out about a rock by just touching it?

2. Name three ways you could group rocks that are alike?
Quick Lab

What can scratch it?

What to Do

1. **Classify.** Scratch each rock with your fingernail. Put all the rocks you marked with your fingernail in a group. Label the group “Not Very Hard.”

2. **Observe.** Scratch the unmarked rocks with a penny. Put all the rocks marked by the penny in a new group. Label the group “Harder.”

What Did You Find Out?

3. What might be able to scratch the rocks that haven’t been marked? Could a diamond scratch them? How do you know?

You need

- rocks
- pennies
Compare

When you compare, you look for ways that things are alike and different.

Learn It

Cats meow and have four legs. Dogs bark and have four legs. You can record how cats and dogs are alike and different in a Venn diagram. You write how the animals are alike in the space where the two circles meet.
Try It

Look at the pictures below. Then try the skill.

How are feldspar and quartz alike? How are they different?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

1 Use another piece of paper. Make a Venn diagram to compare feldspar and quartz.

2 Write About It. Find two other rocks and compare them. Use another piece of paper to make a Venn diagram.

________________________________________________________________________
________________________________________________________________________
How can you change rocks?

What to Do

1. Observe. Look at rocks under a hand lens. Describe what you see.

2. Put the rocks in a jar of water. Shake the jar for two minutes.

You need
- rocks
- hand lens
- jar of water
Explore More

3 Communicate. Look at the rocks under a hand lens. How did the rocks change?

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________
What can change rocks?

In this activity, you will observe how a rock can change.

What to Do

1. Look carefully at the medium-sized rock. Is it rough or smooth? Wrap a towel around the rock.

2. Watch while your teacher hits the rock with a hammer.

3. Open the towel to look at the rock now.

What Did You Find Out?

1. How did the rock change?

________________________________________________________________________

________________________________________________________________________

2. What forces in nature might change a rock like the hammer did?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

You need

- medium-sized rock
- towel
- hammer
Quick Lab

How can vinegar change limestone?

What to Do

1 Experiment. Put a small piece of limestone in a cup. Pour enough vinegar to cover the limestone. Be sure to wear goggles!

2 Observe. Watch carefully. What do you see? What is happening to the limestone?

You need
- vinegar
- limestone
- small clear plastic cup
- goggles
- rubber gloves

What Did You Find Out?

3 Predict. How could you test a rock to see if it contains the mineral calcite?
What is in soil?

What to Do

1. Put some soil in a strainer. Gently shake it over a plate.

   ![Image of soil being shaken through a strainer]


   ![Blank space for drawing]
3. Pour the soil in the strainer on to another plate. Observe the soil. Draw what you see.

Explore More

4. Draw a Conclusion. What is in this soil?
How are these soils alike and different?

In this activity, you will discover how soils are alike and different.

What to Do

1 Study the photos of soils. Look at each soil.

2 Describe the first soil. What do you think it is made of?

3 Compare all the soil photographs.

What Did You Find Out?

1 How are the soils alike? How are the soils different?

You need

• photo sorting cards 21–23, showing different kinds of soil
How much water can it hold?

What to Do

1 Experiment. Fill one flower pot halfway with sandy soil. Have a partner hold the pot over the empty bucket. Then pour one half cup of water into the flower pot.

2 Observe. Pour the water that is in the bucket back into the measuring cup. How much water is in the measuring cup?

What Did You Find Out?

3 Compare. Repeat this experiment with the other two soils. Why do you think the soils absorbed different amounts of water?
Which soil is better for growing plants?

Find out the kinds of soil plants need.

**What to Do**

1. **Measure.** Fill one cup with 1 cup of sand. Mix the soil. Label the pot Sand.

   ![Sand image]

2. **Measure.** Fill another cup with 1 cup of topsoil. Label this pot Soil.

   ![Soil image]

**You need**

- 2 cups
- sand
- topsoil
- seeds
- measuring cup

---

© Macmillan/McGraw-Hill
Observe. Plant a seed in each cup. Put water in each cup. Observe how each plant grows.

Draw a Conclusion. What happened to the seed in each cup? Which soil is better for growing plants?

Investigate More

Predict. What will happen if you plant a seed in a mix of sand and soil?
How can we get clues from prints?

What to Do

1. Press a secret object into clay. Gently take the object away.

2. Observe. Trade clay prints with a partner. Look at the print under a hand lens.

3. Infer. What object do you think made the print? Draw a picture.

You need
- clay
- small objects
- hand lens
Explore More

4 Communicate. What clues did you use to figure out what made the print?

________________________________________

________________________________________

________________________________________
What made each fossil?

What to Do

1. **Compare** Look at all of the fossil photographs. Match each print with the animal or object that could have made the print.

What Did You Find Out?

1. How can you tell an animal print from the print of an object?

2. How are the animal prints different from one another?
How can animals become fossils?

1 **Make a Model.** Pour a thin layer of sand in each glass. Make sure each glass has a different color sand.

2 Stack the glasses on top of one another. You should see four layers of sand on top of each other.

3 **Observe.** This is a model of how sedimentary rock is made. Over time, layers of rock form on top of each other. Draw a picture of what you see.

You need

- 4 different colors of sand
- 4 clear plastic glasses

4 **Infer.** How can this model help us understand how an animal could become a fossil?
Sequence

A sequence tells the order in which things happen. A sequence tells what happens first, next, and last.

Learn It

Think about how a plant grows. Then look at the pictures and put them in order. You can use a chart to help you tell the sequence.

▲ A seedling grows.

▲ I plant a seed.

▲ The plant gets bigger.

I plant a seed.    ___________  →  ?  →  ?

first    next    last
Try It

Look at the pictures. Then try the skill.

1. What picture comes first? Next? Last?

2. What happened to the fern?

3. Write About It. How do fossils form?

© Macmillan/McGraw-Hill
What clues can you find in this fossil?

What to Do

1. **Observe.** Look at the picture of the fossil.

   ![Image of fossil]

2. **Infer.** Draw a picture of what this animal might have looked like.
3 Infer. Look at the feet. How do you think this animal moved? Why?
What clues do you see?

In this activity, you will discover how fossils give clues about what an animal might have looked like.

What to Do

1. **Observe.** Look carefully at the fossil photograph. What clues does the fossil give about what the animal looked like when it was alive?

What Did You Find Out?

1. **Draw a picture of what you think the animal might have looked like.** Discuss your drawing with a partner.
Quick Lab

Can you put a skeleton back together?

What to Do

1 **Infer.** Work with your group to put the skeleton pieces together. Tape the bones in the places where you think they belong.

2 **Compare.** Look at your skeleton next to the picture of the whole skeleton. How is your group’s skeleton like the actual skeleton? How is it different?

What Did You Find Out?

3 What could have made your job easier?

4 How did your group act like scientists?
How do clues help scientists put fossils together?

Find out how scientists put fossils together.

What to Do

1. Work in a small group. Roll out some clay and press a leaf into it. Peel it off carefully.

2. Cut your leaf print into two pieces. You do not have to use straight lines.
3 Trade your leaf prints with another group.

4 Infer. Use clues in the leaf prints to match them and put them together.

Investigate More

Communicate. How would you put together a dinosaur? How did this activity help you learn how paleontologists work?
Explore

How do animal fossils compare to animals today?

What to Do

Observe. Look at the fossil of the saber-toothed cat. Describe what you see.

-----------------------------------------------------------------

-----------------------------------------------------------------

-----------------------------------------------------------------

[Image of a saber-toothed cat fossil]
2 Look at the picture of the cat. Describe what you see.

3 Compare. How are the animals alike? How are they different? Make a Venn diagram to compare.
Which animals could be related?

What to Do

1. **Observe.** Look at the fossil photos.

2. **Compare.** To which animals do these fossils look as if they are related?

   __________________________________________
   __________________________________________

3. **Compare.** Look for similarities between the fossil and the animal. How could you tell which animals seemed to go together?

   __________________________________________
   __________________________________________

What Did You Find Out?

4. **Make your own rule to classify the animals. Tell about it.**

   __________________________________________
   __________________________________________

You need

- photo sorting cards 31, 32, 36–40
What fossils can you dig up?

What to Do

1 **Make a Model.** Your teacher will give your group a box filled with plastic bones covered by sand. Watch your teacher as she divides the box into four parts. Use the string to divide your box. These parts will help you keep track of where you find each fossil.

2 **Observe.** Dig carefully in the box to look for fossils. Use the plastic spoons and paint brushes as tools. Make a sketch on another piece of paper of each fossil that you find. Label each fossil with its location.

What Did You Find Out?

3 **Draw a Conclusion.** How was the activity like what paleontologists do? How was it different?

You need

- box filled with sand
- toy plastic bones
- plastic spoons
- small paint brushes
- string
What ways do you use water?

What to Do

1. **Record Data.** How many times do you use water during the day?

2. How many times did you drink water?

What other ways did you use water?

Make a tally chart.

<table>
<thead>
<tr>
<th>How I Use Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drink water</td>
</tr>
<tr>
<td>Wash hands</td>
</tr>
<tr>
<td>Water plants</td>
</tr>
</tbody>
</table>

California Standard 2 IE 4.e.
3 Use your tally chart to make a bar graph. Show how many times you used water.

4 Communicate. What ways do you use water at home?
How do we use water?

In this activity, you will find out where and how water is used in school.

What to Do

Use the word web below to write your ideas. In the two circles under the question, write where and how water is used in school.

Where in School Is Water Used?

Where: ____________
How: ____________
_____________

Where: ____________
How: ____________
_____________

Where: ____________
How: ____________
_____________
What resources do we write with?

What to Do

Fold a piece of paper in half. On one side of the paper, use the pencil to write your name. On the other side of the paper, use the charcoal stick to write your name.

What Did You Find Out?

Compare. How is the writing for each name different? Why do you think an artist might use charcoal instead of a pencil?

• pencil
• charcoal stick
• cup of water

Compare. Repeat the exercise, but this time dip the pencil and the charcoal in water before you write. Talk about how the water changed the way the pencil and the charcoal wrote.
Record Data

When you record data, you write down information in a chart.

Learn It

How many dogs and cats do students in your class have? You can record the numbers in a tally chart. Then you can use the tally chart to make a bar graph. You can compare the number of cats and dogs.

Our Pets

| cats |  ||
|-----|---|
| dogs | |||||

Pets

<table>
<thead>
<tr>
<th>cats</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>dogs</td>
<td></td>
</tr>
</tbody>
</table>

Number of pets

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>
Try It

Look around your classroom. Find objects made out of plants. Find objects made out of minerals. Record what you find in the tally chart below. Then use a separate piece of paper to make a bar graph.

<table>
<thead>
<tr>
<th>Objects in Classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objects made out of plants</td>
</tr>
<tr>
<td>Objects made out of minerals</td>
</tr>
</tbody>
</table>

1. How many objects made out of plants did you find?

2. How many objects made out of minerals did you find?

3. **Write About It.** Why is a bar graph useful?
How do we use plants and animals?

What to Do

California Standard

2 IE 4.d.

1 Observe. What are you wearing today?
What clothes are made from plants?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
2. Look at your shoes. What parts are made from animals? What parts are made from plants?


Explore More

3. Observe. Look around the room. What things are made from plants?


What things are made from animals?


How do you know?
What are these clothes made of?

In this activity, you will discuss some ways people use natural resources.

What to Do

1. What are some natural resources that were used to make the items that you are wearing today?

2. Work with your partners. Look at the clothes and shoes in the catalog. What natural resources are they made from? Make a list.

What Did You Find Out?

3. Share your list with another group. How are your lists similar? How are they different?
Make yogurt cheese

What to Do

1. Put a piece of cheesecloth inside the colander. Put the colander over the large bowl.

2. Put one quart of plain yogurt into the colander. Let the extra liquid drain into the bowl. What do you see in the bowl?

3. Cover the colander and put it in the refrigerator overnight.

What Did You Find Out?

4. Record Data. Uncover the colander. What changes do you see in the yogurt?

You need

- colander
- large bowl
- cheesecloth
- plain yogurt
- plastic spoons
What happens when you shake cream?

Find out what will happen to cream when you shake it.

What to Do

1. **Measure.** Measure one quarter cup of cream.

2. **Pour the cream into the jar.** Put on the lid tightly.

3. **Take turns shaking the jar.**
4 **Observe.** What happened to the cream? How did it change?

_________________________________________________________________

_________________________________________________________________

5 **Draw a Conclusion.** How do we use cream? Discuss your answers with a partner.

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

**Investigate More**

**Communicate.** How do people use chickens? What other animals are important to people? Why?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
How can we use the Sun’s light?

What to Do

California Standard

2 IE 4.b.

Measure. Pour 1 cup of water into each bowl. Measure and record the temperatures. Record the temperatures in the chart on the next page.

You need

• 2 bowls
• measuring cup
• water
• thermometer
2 Record Data. Put one bowl in a sunny place. Put the other in a dark place. Measure the temperatures at the end of the day. Record the temperatures in the chart below.

<table>
<thead>
<tr>
<th></th>
<th>Starting Temperature</th>
<th>Temperature Later</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowl in sunny place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowl in dark place</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 Communicate. What happened to the water?

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

Explore More

4 Draw a Conclusion. How do we use the Sun’s light?

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
How do we use the Sun?

In this activity, you will discuss how people use the Sun.

What to Do

Think about how the Sun is used for food, energy, and fun. Write the ways people use the Sun on the rays of the Sun below. In the center of the Sun, draw a picture of one way people use the Sun.

You need

- crayons
Quick Lab

Collect solar energy

What to Do

1. Fill both bowls with water. Record the temperature of the water in each bowl in the table below.

2. Cover one bowl with plastic wrap. Tape it to the bowl. Put both bowls in a sunny spot. Wait one hour. Record the temperature of the water in each bowl again.

What Did You Find Out?

3. Which bowl had the greater temperature change? Why?

<table>
<thead>
<tr>
<th></th>
<th>Beginning Temperatures</th>
<th>Temperature After 1 Hour in a Sunny Spot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowl #1 (with plastic wrap)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowl #2 (no plastic wrap)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You need

- two bowls
- plastic wrap
- tape
- water
- thermometer

Chapter 5 • Earth’s Resources
Activity Lab Book

Use with Lesson 3
Resources of California

© Macmillan/McGraw-Hill
Where is it?

What to Do

Work with a partner. Pick an object in the picture. Do not tell your partner what the object is.
2 Communicate. Describe where your object is. Give clues to your partner. Your partner will find the object.

3 Switch with your partner and try again.

Explore More

4 Communicate. Write directions to find an object in your classroom. Then switch with a partner.
I Spy!

In this activity, you will choose an object and describe its position without telling what the object is.

What to Do

1. Work with a partner. Choose an object that you see nearby. Write two sentences to tell where it is. Use position words.

2. Show your partner your sentence. Do not tell your partner what the object is. Ask your partner to guess the object that you chose. When your partner finds the object, it is your turn to find an object.

What Did You Find Out?

3. What position words helped you to guess an object?
Scavenger Hunt

What to Do

Get a clue card from your teacher. With your partner follow the directions on the clue card to find the mystery object.

Write the name of the mystery object on the index card. Measure the object and write its length on the card. Your teacher will give you a star sticker and a new clue card if you have the right object and measurement.

Repeat this activity until you have found and measured five mystery objects.

What Did You Find Out?

Communicate. How did your results compare with your classmates?
Measure

When you measure distance, you find out how far two objects are from one another.

Learn It

Measure the distance between your elbow and your fingertips. You can measure in inches or centimeters. You can even measure in paper clips! Then you can write what you find out in a chart. On another piece of paper make a chart like the one below.

<table>
<thead>
<tr>
<th>Distance from Elbow to Fingertips</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Jamal</td>
</tr>
<tr>
<td>Sarah</td>
</tr>
</tbody>
</table>
Try It

Make a starting line on the floor. Jump! Put tape where your feet land. Use a ruler to measure how far you jumped. Use centimeters and inches. Then line up paper clips to measure how far you jumped. Record what you find out in the chart below.

<table>
<thead>
<tr>
<th></th>
<th>Centimeters</th>
<th>Inches</th>
<th>Paper Clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jump 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jump 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jump 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 How many inches was the longest jump?

2 How many paper clips was the shortest jump?

3 Write About It. What else can you use to measure distance?
How do different things move?

What to Do

1. Work with a partner. Put two small objects on a table. Tap each object.

You need

- small objects

2. Observe. How did each object move?

________________________________________________________________________

________________________________________________________________________
Explore More

Predict. Try moving other objects. Which object do you think will travel the farthest? Why do you think so?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Out of the window

In this activity, you will observe an object from outside and tell how the object is moving.

What to Do

1. Look outside the classroom window for moving objects.
2. Communicate. How does the object move?

What Did You Find Out?

3. Do you think your object can move in a different way? How?
Quick Lab

Crazy races

What to Do

1. **Predict.** What are some ways that you can move across the room besides walking or running? Which is the fastest? The slowest?

2. **Record Data.** Take turns acting out a movement. Use the stopwatch to time how long it takes someone to move across the room. Record the time on the chart below.

<table>
<thead>
<tr>
<th>Kind of Movement</th>
<th>How Long Does It Take?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
</tbody>
</table>
Which toy moves fastest?

You can compare the speeds of objects.

What to Do

1. **Measure.** Put tape on the floor to make a starting line. Then put tape 20 centimeters away to make a finish line.

   **Step 1**

2. Wind up a toy. When you let go of the toy at the starting line, have your partner start the stopwatch. When the toy crosses the finish line, stop the watch. Record how long it took for the toy to finish. Use the chart on the next page.
Wind up another toy and repeat the steps. Record the time on the chart.

Compare. Which toy was faster? If you did not have a stopwatch to measure the time, how could you find out which toy was faster?

Investigate More

If the finish line were farther away, would the same toy win? How could you check your answer?
How do you make things go farther and faster?

What to Do

Line up the car at a starting line.
Push the car gently over the line.

Step 1

You need

- toy car
- masking tape
- ruler
2 Measure. How far did it go?


Step 2

3 Do the activity again, but this time push the car harder. Observe what happens.

Explore More

4 Predict. What do you think would happen if you pulled the car toward you? Would it go as far?
Heavy lifter

In this activity, you will compare lifting different objects.

What to Do

1 Predict Which object do you think will be the easiest to lift? Why?

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

2 Work in a group. Lift each object. Make a list of the objects you lifted. Put them in order from the easiest to lift to the hardest to lift.

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

What Did You Find Out?

3 What was the difference between lifting a light object and a heavy object?
## Elastic strength

### What to Do

1. **Be Careful!** Put on safety goggles for this Quick Lab.

2. **Measure.** Measure and record the length of each rubber band in the table below. Then observe as two classmates slowly pull on the ends of a rubber band.

3. **Record Data.** Measure how long the rubber band can be stretched. Record the data in the table below. Repeat with two other rubber bands.

<table>
<thead>
<tr>
<th>Rubber band</th>
<th>Length Without Stretching</th>
<th>Length With Stretching</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. **Compare.** Which rubber band stretched the longest?

### You need

- measuring tape
- rubber bands of different sizes
- garden gloves
- safety goggles
How can you slow something down?

What to Do

1. Make a ramp out of books and cardboard.

   **Step 1**

   ![Image of ramp made from books and cardboard]

2. **Measure.** Put the car at the top of the ramp and let go. Do not push it. Measure how far the car went.

   ____________
   ____________
   ____________
   ____________
   ____________
   ____________

You need:
- cardboard
- books
- toy car
- ruler
- sandpaper
3 **Compare.** Tape sandpaper to the cardboard. Repeat the activity. Which ramp slowed the car down more?

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

**Explore More**

**4 Predict.** What do you think would happen if you put cloth on the ramp?

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
What has the most friction?

In this activity, you will learn which surface will slow down a ball the most.

What to Do

1. Work with a partner. Gently roll a ping pong ball on a bare floor. Have your partner time how long the ball rolls.

2. Gently roll the same ping pong ball on a floor that has a thin rug. Try to use the same force to roll the ball that you used before. Have your partner time how long the ball rolls.

3. Repeat the step using a thick rug on the floor.

What Did You Find Out?

4. What kind of floor has the most friction? Which kind has the least friction? Explain how you know.
Forced through a maze

What to Do

1. **Experiment.** Use the pencil to push the cube along the maze that your teacher has given you.

2. **Observe.** How did you change the force to make the cube move through the maze?

3. **Experiment.** Use the pencil to push the ball along the maze.

What Did You Find Out?

4. **Compare.** How was moving the cube different from moving the ball? Which took less force?
How can a push help you lift something?

What to Do

1. Tape a pencil to your desk.
2. Put the second pencil across the first pencil.
3. Put a book on one side of the second pencil. Then lift the book by pushing the pencil down.

You need
- tape
- 2 pencils
- book
- goggles
Explore More

4 Predict. What would happen if you moved the book closer to the taped pencil? Try it.
Making a pencil lever

In this activity, you will make a lever.

What to Do

1. Balance a ruler across the pencil. Try to make both ends of the ruler the same height away from the table.

2. Place a penny on each end of the ruler. What happened?

3. Now add one penny to one end of the ruler. What happens?

4. What would happen if you placed a nickel on one end and a penny on the other end? Why?

You need

• 12-inch ruler
• pencil
• 3 pennies
How does an inclined plane make work easier?

What to Do

1. Predict. How could you move a tennis ball without throwing or pushing it? Write your ideas below.

2. Experiment. Work with a partner. Use the books to build an inclined plane.

3. Compare. How are all the inclined planes in the classroom different? What does the steepness of a ramp do to a rolling ball?

4. Measure. Roll a ball down the plane. Put tape where the ball stops. Use the ruler to measure how far the ball has rolled. Record your data.

You need

- tape
- books
- tennis ball
- ruler
Predict

When you **predict**, you describe what you think will happen. You use information about what has happened before to decide what could happen next.

Learn It

Joe and Larissa need to move boxes up to their apartments. Who do you think will finish first?

![Diagram of two people moving boxes into apartments with stairs and elevators]

**What I Know**

I know it takes longer to climb stairs than to take an elevator.

**What I Predict**

I predict that Larissa will finish last.
Try It
Miguel and Eric have a race. Miguel runs and Eric roller skates.

1 Predict. Who do you think will win? Why?

________________________________________

2 What information did you use to help you predict?

________________________________________

3 Write About It. Write a story about a race that uses simple machines.

________________________________________
Does one fall faster?

What to Do

1. Put the newspaper on the floor.
2. Let go of the two lemons at exactly the same time.
3. Have a partner watch to see which one hits the ground first.

You need
- newspaper
- 2 lemons
- 1 grape
4 Predict. What will happen if you let go of a grape and a lemon at the same time?

____________________________________________________________________________________

____________________________________________________________________________________

Explore More

5 Try this activity with an object that is heavier than a lemon. Which one falls first?

____________________________________________________________________________________

____________________________________________________________________________________
How far do the cars go?

In this activity, you will measure how far toy cars of different weights will roll down a ramp.

What to Do

1. Stack books on the floor. Then place one end of the cardboard on the edge of the top book to make a ramp.

2. Take the toy car that feels the heaviest. Hold it at the top of the hill and let go. Place a piece of tape on the floor where the car stops rolling. Measure the distance from the top of the hill to the tape.

3. Repeat the steps with the lighter weight toy car.

What Did You Find Out?

4. Which toy car traveled the farthest?

5. How did the car’s weight affect the distance it traveled?
Quick Lab

How does a scale measure gravity’s pull?

What to Do

1. Hold each object in your hand. Which one do you think is heavier? Record your predictions in the chart below.

2. Record Data. Weigh both objects on the scale. Record the weights in the chart below. Was your prediction correct?

3. Predict. Repeat the step with two more objects. Place the objects in order from lightest to heaviest.

<table>
<thead>
<tr>
<th>Object</th>
<th>Prediction</th>
<th>Actual Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You need

- balance
- objects to weigh (rocks, oranges, balls)
What sticks to a magnet?

What to Do

1. Tie string to a pencil. Tie a magnet to the end of the string.

You need

- string
- pencil
- paper bag
- small objects
- magnet

2. **Predict.** Put the objects in a bag. Which objects will stick to the magnet?
3 Use the magnet to pull out objects from the bag.

Explore More

4 Classify. How are the things that stick to the magnet alike?
Sort for recycling

In this activity, you will learn more about the properties of magnets by sorting trash for recycling.

What to Do

1. Work with a partner. Gather several pieces of metal and aluminum trash.

2. Test each object to see if it can be pulled by a magnet.

3. Sort the objects that can be pulled by the magnet in one group. Put the ones that cannot be pulled by a magnet in another group.

What Did You Find Out?

4. Which objects can not be pulled by a magnet?

________________________________________

________________________________________

________________________________________

You need

- empty soda cans
- scraps of aluminum foil
- metal jar lids and bottle caps
- magnet
Can you change a magnet’s pull?

What to Do

1. Place a paper clip on a table. Find the farthest distance from which the magnet will attract the paper clip. Use the ruler to measure the distance. Record your data in the chart below.

2. Predict. Place a piece of tape over the magnet. Do you think the magnet will attract the paper clip from the same distance? Repeat step 1.

3. Experiment. Repeat the experiment two more times. Add a piece of tape to the magnet each time. What do you notice about the amount of tape added and the distance from which the magnet pulls?

---

<table>
<thead>
<tr>
<th>You need</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>strong magnet</td>
<td></td>
</tr>
<tr>
<td>masking tape</td>
<td></td>
</tr>
<tr>
<td>metal paper clips</td>
<td></td>
</tr>
<tr>
<td>ruler</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnet with no pieces of tape</td>
</tr>
<tr>
<td>Magnet with one piece of tape</td>
</tr>
<tr>
<td>Magnet with two pieces of tape</td>
</tr>
<tr>
<td>Magnet with three pieces of tape</td>
</tr>
</tbody>
</table>
How can you compare the strength of different magnets?

Find out how many paper clips the magnet can attract.

What to Do

1. Hang a paper clip from a magnet. Keep adding more clips in a line until no more will stick.

2. Record Data. Write how many paper clips can hang from the magnet in the chart on the next page.
3 Repeat the steps using different magnets. In the chart below, record the number of paper clips that can hang from each magnet.

<table>
<thead>
<tr>
<th>Kind of Magnet</th>
<th>Number of Paper Clips That Hang From It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar Magnet</td>
<td></td>
</tr>
<tr>
<td>Horseshoe Magnet</td>
<td></td>
</tr>
<tr>
<td>Ring Magnet</td>
<td></td>
</tr>
</tbody>
</table>

4 Communicate. Make a bar graph in the box below to show the strengths of your magnets.

Investigate More

Communicate. Stick two magnets together. How many paper clips can hang from them? Why do you think this happens?
How is sound made?

What to Do

1. Work with two partners. Tie string to a paper clip. Make a hole in the cup. Pull the string through the hole.

2. Hold the cup and string with one partner. The third partner snaps the string.

You need

- string
- paper clip
- paper cup
- goggles
3 Observe. What happened to the string? How did you make sound?

__________________________________________________________

__________________________________________________________

__________________________________________________________

Explore More

4 Predict. Change the length of the string. Predict what will happen. How does the sound change?

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________
Musical ruler

In this activity you will learn more about how to make sounds.

What to Do

1. Place a ruler on the edge of your desk. Make sure more than half of the ruler is hanging off the desk.

2. Tape down the end of the ruler that is on your desk. Use enough tape to hold the ruler in place.

3. Investigate. Find a way to make the ruler make a sound.

What Did You Find Out?

4. How did you get the ruler to make a sound?

5. What did the ruler look like when it was making a sound?

You need

- ruler (plastic or metal)
- strong tape
Rubber band guitars

What to Do

1. **Predict.** How could you use a tub and some rubber bands to make an instrument? Use the materials to test your prediction.

2. **Experiment.** Explore ways to make more than one kind of sound. If you slip a pencil beneath the rubber bands, how does it change your guitar’s sounds?

What Did You Find Out?

3. How did you get different pitches with your instrument? Different volumes?
Why do some fruits have many seeds?

Many fruits and vegetables have seeds. Some fruits, like peaches and plums, have only one seed. Other fruits have hundreds of seeds!

**Purpose**

Find out why some fruits have many seeds.

**Predict**

What might happen after you plant many seeds from a melon?

**Test Your Prediction**

1. **Measure.** Fill a pot with 1 cup of soil.

2. Plant 5 melon seeds in the soil. Make sure each seed is 1 inch below the soil. Water your seeds and put the pot in a sunny place.
Record how your seeds grow.

Draw Conclusions

Why do you think some fruits have many seeds?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Critical Thinking

How do plants keep their seeds safe?

________________________________________________________________________

Why do you think some animals lay many eggs?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
How can color help animals hide?

Many animals blend into their environment to stay safe. Some toads are brown so they can hide in dirt and mud. The wings of some moths look just like tree bark.

Purpose
Find out why some animals grow different color fur or feathers in the winter.

Predict
What color fur will be harder to see in a snowy place?

Test Your Prediction

1. Fold the white paper. Spread out the circles on one half of the paper.

2. Fold over the other half of the paper to hide the circles.

3. Your partner will uncover the circles for ten seconds. Pick up as many circles as you can.
Record Data. How many circles of each color did you pick up? Switch roles with your partner and try it again.

Draw Conclusions

How did color help you pick up circles?

Predict. What will happen if you do the activity on brown paper?

Critical Thinking

Why do you think many desert animals are brown?

How could you find an animal that blends into its environment?
Soil and sand

Some soils have no sand in them at all. Others are almost all sand. Sand can hold water because there is space between the grains. Topsoil can hold water because it has bits of dead plants and animals.

Purpose

Find out if soil or sand dries first.

Predict

How fast do you think the soil and sand will dry? Which one will dry faster?

Test Your Prediction

1 Measure. Pour one cup of soil into a cup. Then pour one cup of sand into a cup.

2 Place both cups in a sunny place.
Add three tablespoons of water to each cup.

Touch the top of the soil and the sand after a few hours.

**Draw Conclusions**

Which stayed more damp, the soil or sand?

Why do you think most plants grow better in soil than sand?

**Critical Thinking**

Wind can blow sand away easily. How do you think plants stay in the sand?

Why do you think soils are different colors?
Be a Paleontologist

Suppose you are a paleontologist who found a print. You want to take the print with you so you can study it later. How would you do that? Paleontologists make casts out of prints.

Purpose
Find out how to make a cast of a print.

Predict
How can you copy a print?

Test Your Prediction

1 Make a handprint in clay. Observe it with a hand lens.

2 Measure. Mix 1 cup of plaster of paris with a half cup of water in a large cup.
3 Pour the plaster of paris into your clay handprint. Let the plaster of paris harden.

4 Separate your cast from the handprint. Observe your cast with a hand lens and draw what you see.

Draw Conclusions

5 How did the plaster of paris help you?

______________________________

6 How is the cast different from the handprint?

______________________________

Critical Thinking

1 How could you match the handprints to the people who made them?

______________________________

2 If you found a trail of footprints, how could you tell if the animal was walking or running?

______________________________
Wind Power

You know that the wind can make things move. Sailboats use wind to move across the water. Many plants use the wind to move their seeds to new places. We also use wind to give us energy. When windmills turn, they make electricity. We can use this electricity to heat homes.

Purpose

Find out how we can use wind.

Predict

We can use wind to make things move.

Test Your Prediction

1. Make a sail out of paper. Cut a small square and then fold it into a triangle.
2. Tape your sail to one of the cars.
3 **Measure.** Make a starting line and make a finish line that is 20 centimeters away.

4 Line up both cars at a starting line. Work with a partner and blow on the cars.

**Draw Conclusions**

5 Which car crossed the finish line first? Why?

6 What do you think would happen if the sail was bigger?

**Critical Thinking**

1 Why is wind power useful? How can we use wind?

2 Which do you think is a better natural resource, wind or coal? Why?
Spin an Egg

Isaac Newton was a famous scientist who came up with the three important laws of motion. The first law of motion says that an object that is not moving will not move until something makes it move. This first law also says that if an object is already moving, it will keep moving until a force speeds up or slows down the object.

It is easy to tell the difference between a hard-boiled egg and an uncooked egg by using Newton’s first law of motion.

Purpose

Find out if a hard-boiled egg or an uncooked egg stops spinning first.

Predict

Which egg will stop spinning first, a hard-boiled egg or an uncooked egg?

Test Your Prediction

1. Spin a hard-boiled egg.
2 Stop the spinning egg for a second and then let go.

3 Spin an uncooked egg.

4 Stop the spinning egg for a second and then let go.

5 Observe. Look at both eggs after you let go of each.

Draw Conclusions

6 Which egg stopped spinning first? Why?

7 What do you need to do to stop an egg from spinning?

Critical Thinking

1 How would you stop a soccer ball from moving?

2 Why do you think a ball will not stop moving in the middle of the air?
The Force of Gravity

Isaac Newton was a scientist who discovered the force of gravity in 1687. The story goes that one day he was sitting under an apple tree and an apple fell out of the tree and hit him on his head. He wondered why the apple fell down and not up. He explained this by the force of gravity. Even though you can not see it, gravity pulls all things toward the center of Earth. Some things fall faster than others.

Purpose

Find out what happens when you drop a penny and a sheet of paper at the same time.

Predict

Will the paper and penny land on the floor at the same time?

Test Your Prediction

Hold a sheet of paper in one hand and a penny in the other.
Hold each item at the same height and drop them at the same time.

**Observe.** Look carefully as each item falls to the ground.

**Draw Conclusions**

Which fell to the ground first, the penny or the sheet of paper? Why?

---

**Critical Thinking**

Which do you think would fall first, a feather or a pencil? Why?

---

How could you find out if heavier things fall faster than lighter things?
Move with Magnets

Every magnet has two poles. Poles are the places on a magnet where the magnet’s pull is the strongest. Every magnet has a south pole and a north pole. The poles are at opposite ends of the magnet. Two of the same poles will repel, or push away, from each other. Two opposite poles will attract, or pull toward each other. Two north poles will repel each other. A north and a south pole with attract each other.

Purpose

Find out how to move a toy car without touching it.

Predict

What will happen if you put a magnet next to a car with a magnet on it?

Test Your Prediction

1. Tape a bar magnet to the top of the toy car.
2 Use a second bar magnet to push the car.

Draw Conclusions

3 How can you move a toy car without touching it?

___________________________________________________________________________

___________________________________________________________________________

4 What poles did you put near each other to push the car?

___________________________________________________________________________

Critical Thinking

1 What ways can we use magnets?

___________________________________________________________________________

___________________________________________________________________________

2 What else does a magnet attract?

___________________________________________________________________________
What is the best way to grow corn?

Ask Questions
What does a seed need in order to grow? How much water does a seed need to grow? Does a seed need soil to grow?

Make a Prediction
Corn seeds need just the right amount of water to grow.

Test Your Prediction
1. Place half an ear of corn in the pan. Lay the corn on its side.
2. Pour water in the pan until half of the corn is under water.
3 **Predict.** How many seeds will sprout? Where will they sprout?

4 Change the water every two days. Make sure you keep the water at the same level. Do not let the corn roll over.

5 **Observe.** Watch your ear of corn grow for a few weeks. Record how your corn changes.

<table>
<thead>
<tr>
<th>Day</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Communicate Your Results**

What happened to your corn? Discuss your results with a partner.

- How did your predictions compare with your results?
- Can seeds have too much or too little water to grow?
Reach for the Sky

Ask Questions
Will corn seeds grow if they are planted in soil? Will they grow if they are planted close to the surface?

Make a Prediction
Corn seeds will not grow if they are planted too deep in soil.

Test Your Prediction
Put two corn seeds in a clear cup. Put the seeds against the side of the cup so you can see them. Add a little soil to the cup to cover the seeds.
2. Put two corn seeds against the side of another cup. Add a lot of soil so that the seeds are deep in the soil.

3. Put two more seeds in a third cup. Add soil until the seeds are 1 inch below the surface.

4. Predict. Which seeds will sprout?
5 Record Data. Keep the soil moist and record how your seeds change.

<table>
<thead>
<tr>
<th>Week</th>
<th>How Did the Seeds Change?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Communicate Your Results

Discuss with a group what happened to your seeds.

• Which seeds sprouted?

• Which seeds grow the fastest?

• Which seeds started and then stopped sprouting?
Corny Experiments

What helps plants grow? What keeps plants from growing? Here are some questions that you may want to explore:

• Does corn grow in sand? Does corn grow in clay?
• Does temperature change how seeds sprout? Would your seeds sprout in the refrigerator?
How do we use natural resources?

Soil Sleuth

Ask Questions
Most plants need soil to grow. People and animals also need soil because they eat plants. What is in soil? How many different things can you find in soil? Are all soils alike?

Make a Prediction
What kinds of things do you think are in soil?

Test Your Prediction
Use a spoon to put a little soil on your plate.
2 Use a hand lens and observe your soil.

3 Classify. Find objects that look alike. Put them into different groups.
4. **Record Data.** Write and draw the objects you find in the chart below.

<table>
<thead>
<tr>
<th>Plants</th>
<th>Animals</th>
<th>Rocks</th>
</tr>
</thead>
</table>

**Communicate Your Results**

What did you find in soil? Discuss your results with a partner.

- How did your predictions compare with your results?

________________________________________________________________________

________________________________________________________________________

- What did your partner find in his or her soil?

________________________________________________________________________

________________________________________________________________________

- How do you think the objects in soil got there?

________________________________________________________________________
Fun with Cotton

Ask Questions
We eat many kinds of plants and animals, but we also use them for different things. How do we use plants? What can we make out of cotton plants?

Make a Prediction
What kinds of things do you think people can make from cotton plants?

Test Your Prediction

1 Observe. Use a hand lens to look at a cotton plant. What parts do you see?

2 Carefully take the fluffy, white ball off the plant. Take out all the seeds.

You need
- cotton plant
- hand lens
3 Communicate. What does the white part feel like?

4 Gently pull the cotton apart with your fingers. Stretch and twist the cotton to make thread. How can we use thread?
Communicate Your Results

Discuss what you learned with a partner.
• How do we use thread?

• What other plants do we use everyday?

• How can we use animals to make thread?

More Natural Resources

We use many things from nature. Here are some questions you may want to explore:
• How can we use the Sun to heat water?

• How can we use wind to cool water?

• How can we use water to move things?
How can we test a magnet’s strength?

Magnets Attract

Ask Questions
What happens when magnets are next to each other? How far apart can two magnets be and still attract each other?

Make a Prediction
When do you think magnets will attract each other?

Test Your Prediction

1. Place a magnet on a piece of paper. Mark where the magnet is.

2. Place a second magnet on the paper. Move it toward the first magnet until the first one moves. Make another mark to show where the magnet moved.

3. Measure. How far apart were the magnets when they could attract each other?

You need
• 3 magnets
• ruler
• white paper
4 Now use two magnets to move the first magnet. How far apart were the magnets when they could attract each other?

________________________________________________________________________

________________________________________________________________________

Communicate Your Results
Discuss your results with a partner.

• How did your predictions compare to your results?

________________________________________________________________________

________________________________________________________________________

• Are two magnets stronger than one magnet? How do you know?

________________________________________________________________________

________________________________________________________________________
Pulling Through Water

Ask Questions

What can magnets pull through? Will a magnet attract paper clips through a cup of water?

Make a Prediction

Do you think magnets will attract objects through other things?

Test Your Prediction

Put some paper clips in a cup. Hold one end of the magnet to the side of the cup.
2 Write how many clips the magnet attracted.

3 Fill the cup with water and try the activity again.
4 Record Data. Fill in the chart to share your results.

<table>
<thead>
<tr>
<th></th>
<th>Number of Paper Clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cup</td>
<td></td>
</tr>
<tr>
<td>Cup with Water</td>
<td></td>
</tr>
</tbody>
</table>

Communicate Your Results
Discuss your results with a partner.
• When did the magnet attract more paper clips?

• What can magnets pull through?
Strength Test

What else can magnets do? Here are some questions that you may want to explore:

• Where on a magnet is the pull the strongest?

• How many pieces of paper can a magnet pull through?