

Earth and Sky



Look down. Look up. What do you see? Earth below and sky above!

1. Can You Dig It?

Find a spot with some loose soil in an outdoor area. You will need:

- A magnifying glass.
- A small trowel or garden spade.
- Tweezers.
- White paper or a plastic dish.
- 3' of string.

1. Make a circle on the ground with your string. Look on the surface inside the circle. What do you see? Are there any plants? What about animals? Is there anything else?
2. Use your trowel or spade to dig a hole about 1" deep in the ground. Make sure to stay inside your circle. Pick up some soil. What color is it? How does it feel? Are there any soil creatures? If so, use tweezers and gently put one or two in your white paper or plastic dish. Look at them with the magnifying glass. How would you describe these creatures to your friends?

3. Now dig a 3" hole and a 6" hole. How does the soil from these deeper holes feel? Is it the same color as the soil on the surface? Collect soil creatures from each hole. Put them on your white paper or in your plastic dish. Study them. Are they all the same? Do the animals living on the surface look the same as the ones living 6" below the ground?
4. Share your findings with your troop or group, or with a friend. Make sure to carefully fill in the holes again. Return the creatures to the soil. Leave your circle the way you found it.

2. Hot Time in the Sun

The sun gives heat and light. It dries wet fields and makes farm crops grow. The sun can do much good, but it can also do harm if we are not careful. For example, have you ever felt the pain of a sunburn?

- On a hot, sunny day, go outside and feel different objects in the sun and in the shade. Touch each one softly first to make sure you don't burn your hand. What objects were hot? Cold? Warm? Cool? If you have an outdoor thermometer, measure the temperature in the sun and in the shade. How much of a difference is there?

The heat from the sun turns water into water vapor—tiny drops of water in the air that you can't see. Heat makes water vapor rise in the air. This is called *evaporation*. Try the following experiment:

- Fill a dark cup or glass half-full of water. Stretch some plastic wrap tightly over the top. Put the cup where it is sunny and leave it alone. Look at it again in an hour. What happened?

3. Going, Going, Gone

On a walk or hike, search for places where soil has been worn down or has disappeared. Check the edges of streams or the sides of hills. What causes soil erosion?

To find out, build a big pile of soil about knee-high in your backyard or in a sandbox at a playground. This is your hill. Wet the hill with a watering can. What happens to your hill?

Now find a slope that is covered with grass or plants. Water it with your watering can. What happens? Is the result different from what happened to your own hill made of soil? If so, why? What do you think can be done to stop soil erosion?

Try It!

4. Sky Watching

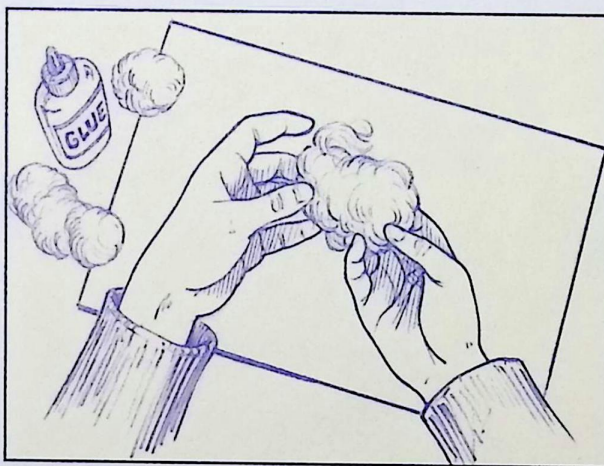
The sky above can be fascinating. Be a sky watcher. Keep an eye on the clouds in the sky. How many different shapes do you see? What do the clouds look like on a rainy day? What do they look like on a sunny day?

Make a cloud picture.

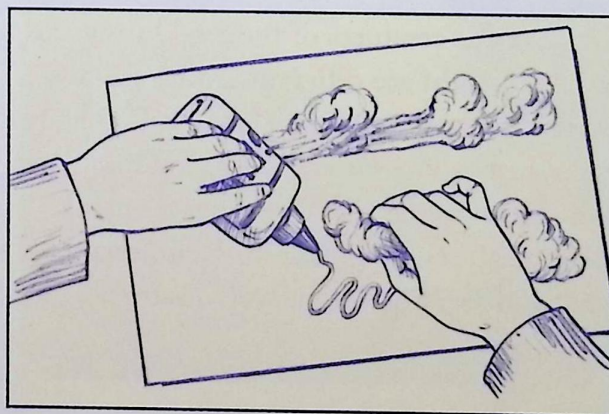
You will need:

- Construction paper.
- Cotton balls.
- Glue.

1. Twist or cut the cotton balls into cloud shapes you saw in the sky.



2. Glue your clouds to the paper.





5. Creatures of the Air

Observe the creatures of the air. During the day, you might see different kinds of birds, butterflies, bees, and other insects. If you are lucky, just as it is turning dark, you might see bats. How do they fly? Watch as many of these creatures as you can. Take notes about what you see. Share what you discover.

6. Make a Rock

When you're outside you can find many kinds of rocks. Some, like *sedimentary* rocks, are formed by mud and sand and other things.

Try this experiment to see how they form.

You will need:

- 1 teaspoon mixture of pebbles, sand, pieces of rock, and dirt.
- Plaster of Paris.
- Water.
- A paper cup.

1. Have an adult help you mix the plaster with water in the paper cup. Make $\frac{1}{2}$ cup.
2. Stir the pebble mixture into the plaster in the cup.
3. After the plaster mix has dried, peel away the paper cup.



7. What's an Eclipse?

There are two kinds of eclipses that happen in the sky. A solar eclipse is when the sun is all or partly hidden behind the moon. A lunar eclipse is when the moon is completely or partly darkened by the earth's shadow.

Here's a fun way to learn more about eclipses.

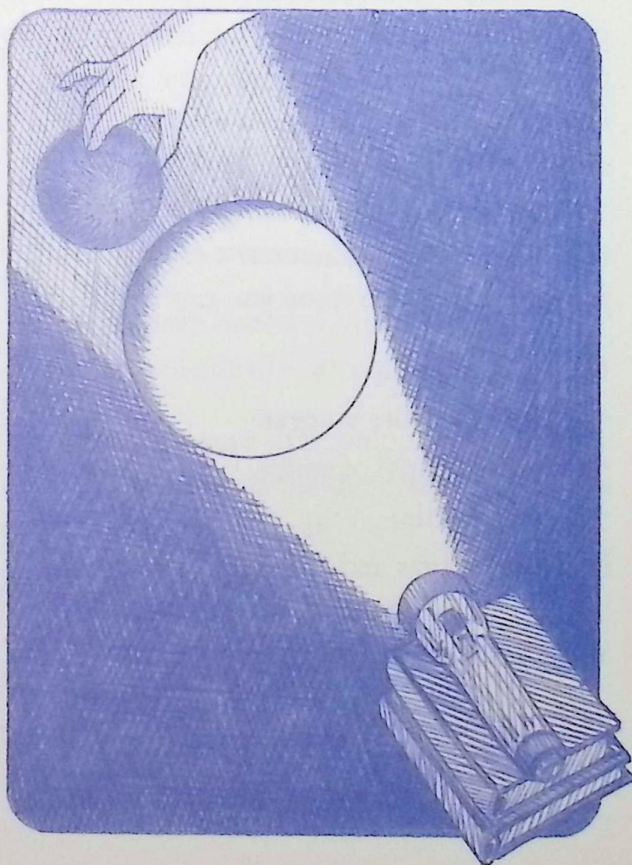
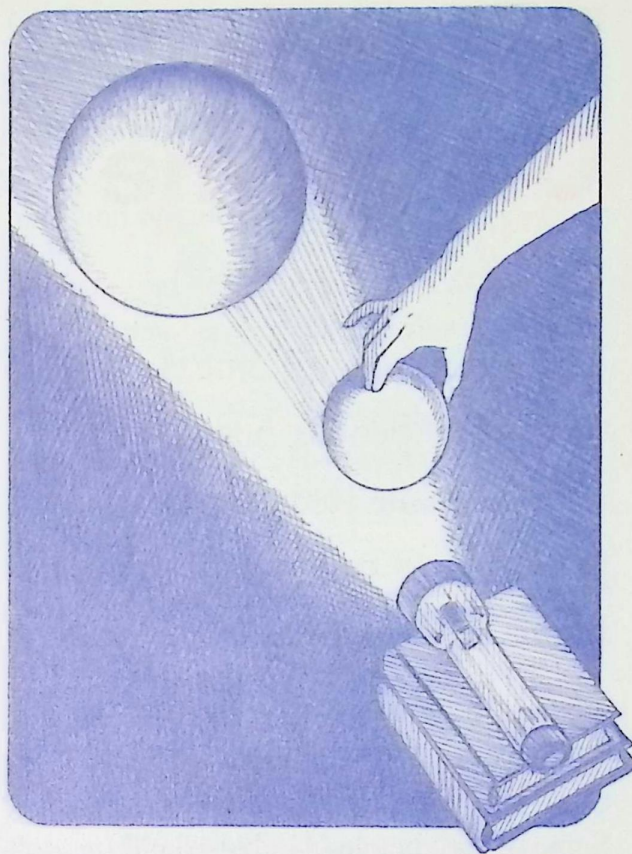
You will need:

- 2 balls of different sizes.
- A flashlight.
- 1 or 2 books.
- A table.
- A dark room.

The large ball will be the earth and the small ball will be the moon. The flashlight will be the sun.

Put the large ball on the table. Place the flashlight on the books and shine it at the large ball, or the earth. Hold the small ball, the moon, between the earth and the sun. Move the moon until you see its shadow touch the earth. Move it to the side so that its shadow moves across the earth. At one point, the moon causes a solar eclipse—the sun is hidden behind the moon.

Now place the small ball on the opposite side of the larger ball. Shine the light of the sun at the larger ball. Do you see how the moon is darkened by the earth's shadow? You have created an example of a lunar eclipse.



Try It!