

Soil can be made up of lots of different kinds of rock and mineral particles. It can contain big particles like grains of sand or the tiny particles that make up clay or different size particles in between. Soil can also contain tiny bits of decayed plants, insects, and animal matter. Most soils are combinations of all of these. Let's see if different types of soil erode differently.

## Materials:

Flat-bottom pan or tray (cookie sheet works well)

Modeling clay

Water

Sand

Potting soil

Paper cup

Pencil

Books

## Teacher or Parent Preparation:

Use a pencil to poke a small hole through the bottom of a paper cup. Poke the hole from the inside out.

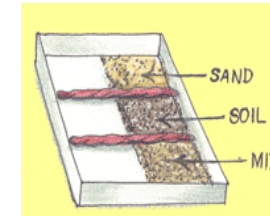
## Procedures:

1. Make two long "snakes" of clay. Press these two pieces down onto the pan to divide the pan into three equal areas.



2. Fill a cup with sand and add about  $\frac{1}{4}$  cup water. Mix the sand and water until the sand is evenly moistened. Spread the sand in a thin layer about  $\frac{1}{3}$  down the first area of the tray.

3. Repeat step 2 using potting soil instead of sand and spread it about  $\frac{1}{3}$  down the middle area of the tray
4. Mix  $\frac{1}{2}$  cup sand and  $\frac{1}{2}$  cup potting soil in a cup. Moisten this mixture as you did before and spread it in a thin layer about  $\frac{1}{3}$  down the last area of the tray. Place a book under one end of the pan to make it tilt as shown below.



5. Place your finger over the hole in the cup and add  $\frac{1}{4}$  cup of water. Hold the cup over the high end of the sand sample and let the water come out of the cup onto the sand. Observe any change in the layer of sand.
6. Repeat step 5 for the potting soil sample and the mixture of sand and potting soil. Try to hold the cup the same distance above each sample. Compare the erosion of all three samples.

## Think about this ...

In the activity, you saw that the same amount of water flowing at the same speed can have different effects on different types of soil particles. How about if you had the same type of soil particles, the same amount of water but changed the speed that the water flows. Which do you think would have a greater effect on the soil, fast-moving water or slow moving water?

You could use the same tray but put a layer of moistened sand in each of the three areas. Then you could use the same amount of water on all three areas but figure out a way to have it flow at different speeds. Design your own way of doing it to find out if the speed of the flowing water has an effect on the amount of erosion.

## Where's the Chemistry?

Water flowing over land has a certain amount of force as it flows. Since the land is made of different size particles made of different materials, and held in place in different ways, the particles are affected differently by the force of the water.



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The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at [www.acs.org/kids](http://www.acs.org/kids).

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## Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

### Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

**Never** eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

**Never** experiment on your own!

**For more detailed information on safety go to [www.acs.org/education](http://www.acs.org/education) and click on "Safety Guidelines".**

