

2nd Grade  
**Science**  
Experiments



# 3

## How do Landforms and Water Relate?

### Key Concepts

The Earth is covered with a variety of natural features, called landforms.

The natural forces of weathering, erosion, and deposition continue to change the surface of the Earth.

Creating and using models as a learning tool provides opportunities to develop a better understanding of information that is too large or too small to see.

## Materials

- 1 cup flour
- 1/2 cup salt
- 1-2 cups water
- large mixing bowl
- sturdy spoon
- resealable bag (optional)
- 7" Styrofoam plate **K**
- 9" plate **K**
- How do Landforms and Water Relate? Island Plans **P**
- tissue
- eyedropper **K**
- paper towels
- 1/4 cup sand **K**
- glue
- 10 toothpicks **K**
- masking tape **K**
- permanent marker
- dinner plate (optional)
- watercolor paints (optional)

## Introduction

When you travel to a new place, you may notice that the earth looks different. Some places are mountainous or hilly, while other places are as flat as a pancake! These differences we notice—hills, mountains, valleys, and flat areas—are landforms. A **landform** is a natural feature found on the surface of the Earth. Landforms include all the different shapes on Earth's surface. They can be as large as a mountain or as small as a tiny sandbar.



volcano

Landforms are shaped by forces inside the Earth and on the Earth's surface. On the Earth's surface, volcanoes erupt and lava flows down the sides and eventually hardens to become new rock or land. Inside the Earth, liquid rock called magma is constantly moving and churning (similar to the way a pot of water boils on your stove). The Earth's

crust, which is broken into seven giant pieces called plates, crash into each other to make hills, mountains and other landforms.

Weathering and erosion, on the other hand, break down all the different landforms. Weathering and erosion create landforms such as valleys and canyons. Both the "building up" and "tearing down" processes have always happened, and continue happening every day.

In this activity, you will create a model of an ocean island. You will create a small collection of landforms that could be found on an island. You will then explore how these land forms interact with water that falls from the sky.

An **island** is land that is completely surrounded by water. We often think of islands surrounded by an ocean or sea, but we can also find islands in a



### Make Connections

Landforms affect people's decisions. They determine where we can build homes, the types of plants and animals that live there, the availability of water and other natural resources, and what kind of weather and climate forms in that region.

river or lake. Here are some landform features you may consider including in your model:

- Mountains
- Hills
- Valleys
- Ocean
- Rivers
- Beaches
- Forests
- Grasslands
- Lakes
- Caves

## Make a Prediction

How do landforms influence where water flows? Can water change landforms?

## Investigate

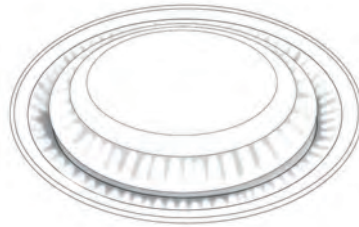
### Make Salt Dough

1. In a large bowl, combine 1 cup flour and 1/2 cup salt. Mix thoroughly.
2. Slowly add a little water at a time, stirring and kneading the mixture with a spoon.
3. Continue adding water and mixing until a soft dough/putty-like consistency is reached (about 1/2 to 1 cup of water). If the material is sticky, it has too much water. Add a little more flour to gain the correct consistency.
4. Store the salt dough in a resealable bag if you are not using it immediately.



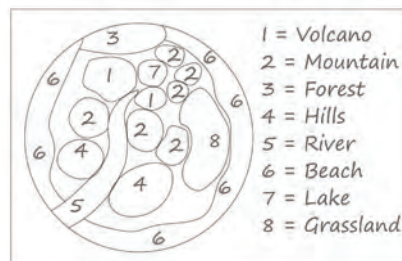
## Create a Unique Island

1. Place a small plate upside down on a larger plate. The upside-down plate will represent the island. The larger plate will represent the water around the island.



2. On the How do Landforms and Water Relate? Island Plans page, make a list of all the landforms you want to have on your island. The landforms should be realistic for an island. Include as many different landforms as possible. Make at least one mountain, hill, or volcano.

3. Then on the same Island Plans page, make a drawing of where you think the different landforms should go on your island. This drawing is just a basic idea. As you build your island, you can add, change, or remove the features.



4. Using your finger, press a thin layer (approximately 1/2 inch thick) of dough around the entire bottom of the small plate. This will represent the rocks, soil, and land of your island.



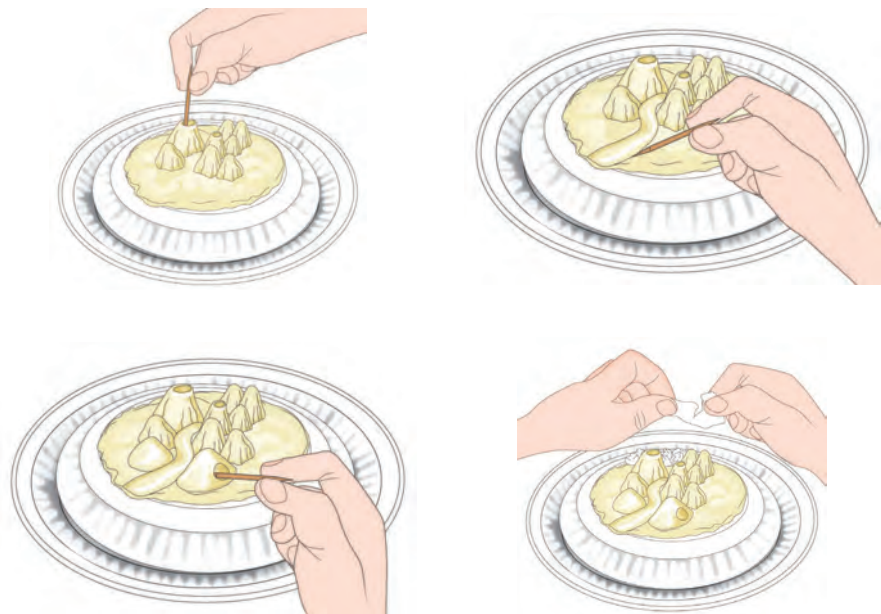
### Make Connections

Landforms influence the type of organisms that live in a particular location.

5. Create the landforms. It is probably easiest to start with mountains or your largest landforms first.

Here are some tips to get you started:

- Pinch mountains and volcanoes into a cone shape.
- Use a toothpick to make the opening to your volcano or to make a cave.
- Press down in the dough to form a river leading to the ocean.
- Make hills by making smaller, rounder versions of mountains.
- Glue down torn up, wadded tissue to make a nice forest.



**Tip:** Place your island on a dinner plate as the water flow may become messy.

6. When your landforms are in place, try dropping water from a eyedropper onto different parts of your island.



Where does the water flow? (Down to the lowest spots.)



Does your island include a river? Did the water flow into the river bed you'd created, or did it make its own river?

Let's pretend there are some loose rocks and dirt on the landforms you created.

7. Use a paper towel to dry off a hill or a mountain. Take a pinch of play sand and lightly sprinkle it on top of that hill. Then drop water from the eyedropper onto this same spot.



What happens to the sand? (The water carries some of it off of the landform.)

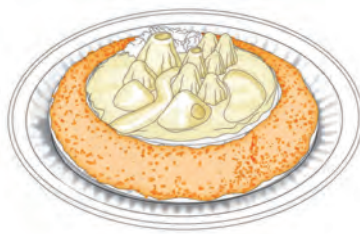
Water always flows downhill. Moving water is strong enough to carry loose rocks and soil away with it. This is called **erosion**.



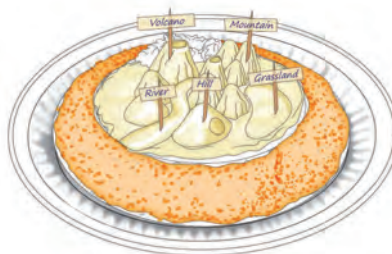
Do you think water erosion is strong enough to change the shape of landforms? (Yes.)

**Tip:** If needed, use a paper towel to dab excess water and sand off of your landforms before continuing with the next step.

8. Smear glue all around the outer edge of the small plate.
9. Sprinkle sand on the glue to make a beach.



10. When you finish your landform model, use toothpicks and masking tape to make marker flags that identify each landform.



### Did you know?

If you follow a mountain stream downhill, you will eventually find a town. That's because towns need water, and it's much easier to build a town by water than to move the water to a town.



### Make Connections

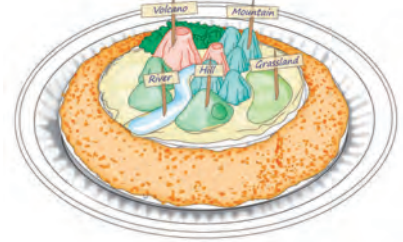
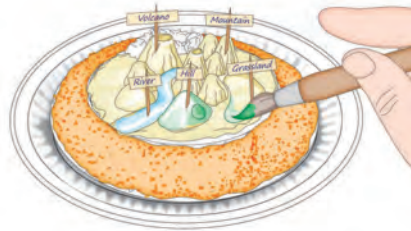
In the winter, the earth hardens and freezes. If water gets into cracks in the ground, it can push the cracks open when the temperature drops because water expands when it freezes. This is why you may see road crews sealing cracks in the pavement in the fall.

- Once you have labeled the landforms, put your island in a safe place to dry and harden. (This may take 24-48 hours depending on how thick your landforms are.) If you can set it in a sunny, warm spot, it will dry more quickly.

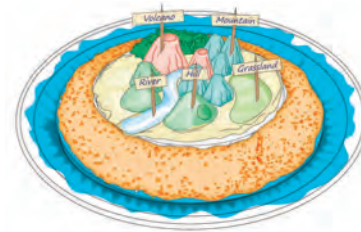
**Try It:** Put your island in the freezer. How does the cold affect the dough land forms? Do you think real land reacts similarly in the cold? Why?

### Optional: Paint the Island

- When the island is completely dry, use watercolor paint to decorate the island. Try to use colors that best represent each landform.



- Finally, paint the outer rim of your large paper plate blue, to represent the surrounding water.



### Draw Conclusions



Where are islands found? (Often in the ocean, but also in rivers and lakes, too.)



How do islands form far out in the middle of the ocean? [Hint: how is new land created?] (Islands can be created by volcanoes.)



How do volcanoes form islands? (Underwater volcanoes continue to erupt. The magma that comes out of the volcano continues to build up until it pokes out of the water.)



What bodies of water do you often find in the bottom of a valley? Why? (Rivers and streams, because water flows downhill from mountains and hills and gather in the valley.)





How do you think valleys form? (Possible: The water flows down the hills to the lowest point, and then flows out of the mountains. The moving water erodes and cuts away at the rock and dirt to make the trench that is the valley.)



How does water influence landforms? How do landforms influence water? (Water runs downhill off of landforms, and finds its way into streams in the bottom of valleys. This wears away landforms through erosion, which changes the shape of them.)

## Takeaway

Landforms come in all different shapes and sizes. Some of them are similar to each other and some of them are distinctly different. Not every location around the world has the same types of landforms. Each landform has its own characteristics and can be put into categories by looking at their similarities and differences. Landforms and water have a special relationship. Water that falls from the sky runs down the landforms to the lowest places. As it flows, it takes small bits of rocks and earth with it. This is called erosion. Models, like the small islands we made today, can help us learn about landforms that are very large in real life.

### Go Further



Write and illustrate a storybook that takes place on your island! Create characters, explain why they are on the island, what is happening to them and what kind of adventure they are having!



Research a new location or an ecosystem. Determine what kind of landforms and features are typically found in that area. Build another model.



Research the Hawaiian Islands. Learn how they were formed and why they are referred to as an “island chain.”



Think of another topic in science (or a different subject) that you have recently studied. Brainstorm a way you could build or use a model to help you. remember what you learned. Then build it.

### See the Bigger Picture

**Geomorphology** is the study of landforms. A **geomorphologist** studies the impact weathering and erosion has on landforms. They also study volcanoes, earthquakes, plate tectonics, and other forces that cause the Earth's landforms to change shape.

# How do Landforms and Water Relate?

## Island Plans

Make a list of all the landforms you want to have on your island. The landforms should be realistic for an island. Include as many different landforms as you would like. Be sure to include at least one mountain, hill, or volcano.

- |          |          |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

Make a drawing of where you think the different landforms should go on your island. This drawing is just a basic idea. As you build your island, you can add, change, or remove the features.

