

### Objectives

The student will be able to do the following:

- Demonstrate their understanding of a watershed
- Carry out an experiment to test a prediction

### Materials

For each group:

- Play-Doh (enough to build two watersheds)
- Spray bottles
- “Dirt” (glitter, crumbs, etc.)
- Plastic or Styrofoam plates
- A direction sheet

### Background

This unit builds on the previous unit on watersheds. Students should understand that watersheds are bounded by ridges and that a river or stream is a central feature of most watersheds. This unit allows students to implement their knowledge through a hands-on activity.

In addition, students will also be introduced to the concepts of making a prediction, and then carrying out an experiment to test the prediction. Teachers may want to spend time discussing the scientific method, but for lower grade levels, this may not be necessary.

### Advance Preparation

Materials should be purchased and if necessary, divided for the appropriate number of groups.

### Procedure

1. Start with a brief review of what a watershed is. Have students define watersheds and make sure that they understand that it is a feature of land, bounded by ridgelines and featuring a river or stream.
2. Explain that in today’s activity, each group will be given the tools to make a model of a watershed. Have the group list the essential features of a watershed in Hawaii (mountain, mountain ridgelines, valley, stream/river, ocean).
3. Go over the directions for today’s activity. Each group will build two watersheds:
  - a. Both watersheds will be covered with dirt
  - b. ONE watershed should be covered with forest
4. Hand out materials and give students adequate time to build the watersheds. Circulate around the groups to make sure that they are building two watersheds according to the directions, and that the watersheds feature ridgelines and valleys. Teachers may want to supervise the application of dirt (glitter).

5. When the students have built the watersheds, bring everybody's attention back to the front of the room. Ask students the following questions, writing their ideas (predictions) on the board:
  - a. What will happen when it rains?
  - b. What will happen to the dirt when it rains?
  - c. Will there be a difference between the watershed with forest and without forest?
6. Students should then use the spray bottles to make it "rain." They should write down what happens when it rains and record any differences between forested and unforested watersheds.
7. Bring the group back together. Have each group stand up and present their watersheds, and discuss what happened when it rained. Keep a tally of results on the board. If time permits, discuss why these results occurred.
8. Students should clean up after themselves. Excess water should be poured into the sink and all materials collected. Watersheds can be saved for future activities or as evidence of their learning.

Note 1: After conducting the test, students should find results that match reality:

- There should be more dirt in the runoff from the unforested watershed than from the forested watershed.
- There could be more total runoff from the unforested watershed than from the forested watershed.

Note 2: This activity can be broken into two if time so requires. Students can build the watersheds, show them off, and then return during another period to test what happens when it rains.

### Activities

1. Build and test watersheds
  - a. Each team should use clay, paper, and any other materials they can think of to build two watersheds (e.g., they may build two mountains, or two "half-bowl" structures. They should be allowed to be creative. Watersheds should clearly exhibit ridgelines and streams (both in logical places).
  - b. Students should sprinkle dirt (glitter) on the ground of each watershed.
  - c. In one watershed, students should build a forest. The other should be "cleared" (no forest)
  - d. At the direction of the teacher, students should use the spray bottles to make it rain, recording any differences between the two watersheds.
2. As homework, students should write a report presenting their predictions and results.

### A note on activity kits

Activity kits were purchased at Walmart, Honolulu, HI in February, 2008. At that time, the cost per group was Play-doh (\$1.82 for a packet of 4 5-oz tubs), Spray bottle (\$0.50), and glitter (1/6 of a packet of 6 purchased for \$3.42 (whole packet) (\$0.57) = \$2.89 + tax per group.

Watershed graphic from: <http://eastmauiwatershed.org/Watersheds/Ahupuaa.htm>



# Build Your Own Watershed!

## Directions:

1. Work with your group.
2. Build two watersheds on the two plates.
  - a. Make sure each watershed has a mountain, a valley, and a river.
3. Sprinkle dirt on both watersheds.
4. Use the play-doh to make some trees. Put a forest on ONE of the watersheds.
5. When the teacher says so, use the spray bottle to make it rain.
6. Were the two watersheds any different? Write down what happened here:

Watershed with forest

Watershed with no forest