



# Floodwaters Lab Activity



## Death Valley National Park

Dynamic Death Valley Pre-Trip Activity

1 hour session

**Essential Question:** How does precipitation change desert landscapes?

### Standard(s):

Next Generation Science Standards:

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

5-ESS1-2 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

### Objectives

Students will be able to:

- use the word precipitation to describe rainfall.
- observe the effect of floodwater.
- make a hypothesis, observation, then a conclusion with given data.
- record and make conclusions about how canyons form.
- describe and analyze how rainfall can affect landforms.

### Overview:

Students will explore precipitation through discussion, videos, and a PowerPoint presentation. For the lab activity, students will explore the way flood waters can affect the landscape and topography in the desert. Students will observe what happens to the landscape as different amounts of water are dropped on the hillside.

### Teacher Background Information:

Water shapes the canyons of Death Valley National Park. While Death Valley receives only 2 inches of rain on average, water is a powerful force. Floodwaters from rainstorms carry rocks, gravel, and sand down from surrounding mountains and deposits them on the valley floor.

Partially due to sparse vegetation, desert soils tend to be hard-packed and do not soak up water quickly. Steep slopes in Death Valley also tend to shed rain rather than absorb it. This water channels into low spots such as canyons and can cause flash floods.

Flash floods can cause very expensive damage to roads and infrastructure. They can also be dangerous. Yet these same flash floods are a major force behind the stark beauty of Death Valley—from Golden Canyon to Badwater Basin.

## Materials:

Each group of students will need:

- 1 plastic shoebox
- 5 rocks different sizes
- 2 cups of dirt sand mixture
- 1 Spray bottle
- 1 watering can or two small cups of water
- Flood data record sheets for each student

## Procedure:

### Anticipatory Set

Ask students to discuss a time when they saw a lot of rain or snow fall from the sky. Ask them what the land looked like before and after the rainfall. Engage students by asking this question: Do you think rainfall can change the landscape?

### Vocabulary

Teach students correct vocabulary using the Floods Vocabulary Powerpoint

### Making the Landscape

- 1) Fill shoebox with rocks and dirt making a slope like feature. It's a good idea to put larger rocks on the bottom before they add dirt to create a bedrock type feel.
- 2) They can use their hands to make sure the dirt is packed well and there is a small dip in the side of the hill for a little bit of a canyon.



## Creating the Flood

- 1) First students should make their hypothesis for each part on the Flood Data Record Sheet.
- 2) Students can use the spray bottle to lightly spray making the hillside a little damp. After each round of “precipitation” or rainfall students should record what actually happened.
- 3) Next, students can use the watering can or cup of water to create a slow rainfall.
- 4) Then, students can use the two cups to create the flood like demonstration.
- 5) Students should answer the questions on the Flood Data Record Sheet as they do each step.



### **Extension Questions:**

What happens when you move the tray? Does it look different after it was moved? What does this simulate?

What can happen if you leave it in the sun? Does the water evaporate? What happened to the dirt? What does this simulate?

### **Extension Activity:**

After the lesson, show Death Valley National Park’s video, “[October 2015 Floods](https://www.youtube.com/watch?v=pgfpBBOOyo0)”  
<https://www.youtube.com/watch?v=pgfpBBOOyo0>

Ask the students to list similarities and differences between the video and their model. This could be explored through a graphic organizer, such as a Venn diagram, on the board or on paper.

### **Vocabulary:**

**Weathering:** The process of breaking large rocks into smaller rocks over time.

**Erosion:** The movement of weathered rock and soil from one place to another.

**Flood:** An overflowing of a large amount of water beyond its normal levels, especially over what is normally dry land

**Precipitation:** Rain or hail that falls to the ground

### **Assessment:**

Student data sheet can serve as an assessment to see if they understand the concept of how flooding in the desert can change a landscape. It can also serve as an assessment for the science process standards.

### **References:**

[Weather Facts: Floods for Kids](http://www.sciencekids.co.nz/sciencefacts/weather/floods.html) - <http://www.sciencekids.co.nz/sciencefacts/weather/floods.html>