

## **Activity: Our World—Water and Soil**

**Activity Level:** Intermediate

Source: Nebraska Agriculture in the Classroom

### **Purpose**

Create a model that fractionally represents the amount of earth's usable soil.

### **Example Topics It Supplements**

Weather; maps; conservation of natural resources

### **Activity Snapshot**

1. Organize and Prepare Supplies
2. Read Background Information
3. Interest Approach
4. Conduct Activity  
Part 1—Student will use a Play-Doh model to make a visual representation.  
Part 2—Using a water bucket as a fractional model, students will illustrate different types of water found on the earth.
5. Ask Follow Up Questions and Make the Connection to Agriculture
  - Who was surprised at the amount of available soil suitable for growing crops and fresh water available? Why?
  - What if the valuable top soil and fresh water, upon which we depend, would be cut in half or disappear?
  - Why is it important to preserve and take care of our soil? Why is soil quality important in agriculture?
  - Why is it important to conserve water? What are some ways we all can conserve water?

### **State Standards It Supports**

MA 4.1.2 – Use drawings and symbols to represent division.  
SS 3.3.1.d Locate Places on maps and globes.  
SC 5.4.2.b – Identify erosions, weathering and deposition.  
SC 12.4.2.c – Evaluate the impact of human activity and natural causes on Earth.

### **Materials**

- Play-Doh—1 per student
- Plastic knives—1 per student
- Inflatable globe—optional
- One gallon container (Ice cream bucket)
- ½ cup measuring cup
- Two small bowls
- Eyedropper

### **What's the Connection to Agriculture?**

Taking care of our soil and water is important because they are needed to grow food. We need crops to feed animals and humans. Farmers strive to be good stewards of the land to protect and use soil wisely to produce food, fiber, and fuel.

Farmers also need to use water for crops and animals to provide food for us. Farmers are mindful of their water use and strive to use the appropriate amount of water for crops and animals, careful not to over water or under water.

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**PROCEDURE:**

1. Organize and Prepare Supplies  
See “Materials” on cover page.
2. Background Information  
Fresh water and soil are essential to growing plants. Plants are used for food, shelter, shade, habitat, landscaping, and much more! We have a finite amount of water and soil, so being good stewards of our earth is important to ensure a sustainable amount of food and products. Plants must use fresh water because salt water will actually make plants wilt—meaning water is leaving the plant passively.
3. Interest Approach  
Ask students: What is essential for growing the food we eat? Explain that fresh water and soil is necessary to supply the world’s population with necessary plant products, like the food we eat.

Ask students to guess if there is more land or water in the world. If a globe is accessible, use that as a visual to explain the relationship of water to land. Students can toss the globe around and tally the number of times their pointer finger lands on water versus land.

4. Conduct Activity  
Part 1—Illustrate the amount of earth’s usable soil. Students will use a Play-Doh model to make a visual representation.

Distribute supplies and conduct Part 1 of the activity.

- a) Shape the Play-Doh into a sphere to represent the world.
- b) Using a plastic knife cut the sphere into quarters. Set aside three quarters to represent the water on earth. The fourth quarter roughly represents the total land area in the world.
- c) Slice the land quarter in half, making two  $\frac{1}{8}$  world pieces. Set aside one of the pieces. This is land inhospitable to people (polar areas, deserts, swamps, very high or rocky mountainous areas). The other  $\frac{1}{8}$  piece of the land area is suitable for living, but not necessarily where crops can be grown.
- d) Slice the  $\frac{1}{8}$  piece into four sections making four  $\frac{1}{32}$  pieces. Set aside three of these pieces. These areas are too rocky, wet, cold, steep, or infertile to produce food. The three pieces also include the areas of land that could produce food but are either national parks, cities, highways, suburban developments, etc.
- e) This leaves  $\frac{1}{32}$  slice of earth. Carefully cut a small thin slice from the Play-Doh along the outer edge. This tiny “peel” represents the surface or top soil, the very thin skin of earth’s crust upon which humans depend. It also represents the amount of soil, which is used for food production to feed the world—less than five feet deep. It is a fixed amount of food producing land.
- f) Display the sections of Play-Doh as a reference. Have students make a pie graph on paper to visually represent the activity. (See end of document for an example.)

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Part 2—Using a model of fractional parts, illustrate the different types of water found in the world. Fresh water is essential for growing the food we eat. This activity shows how much fresh water is available in the world to grow our food.

Distribute supplies and conduct Part 2 of the activity.

- a) Fill a one gallon container, like an ice cream bucket, with water. This represents all the water on the earth. Reference back to the Play-Doh on display and ask the students how much of the earth is water (roughly 75%).
- b) Take  $\frac{1}{2}$  cup out of the container. This represents all the fresh water on earth. This fresh water is found in lakes, rivers, ground water, ice, and living things and is less than 3% of the total water on earth. The  $15 \frac{1}{2}$  cups that are still in the container represent salt water on the earth.
- c) Using an eyedropper, take one drop of the water from the  $\frac{1}{2}$  cup. This drop represents the surface water. The rest of the water in the  $\frac{1}{2}$  cup is groundwater, water bound up as soil moisture, or water in the atmosphere.

5. Ask Follow-Up Questions and Make the Connection to Agriculture

- Who was surprised at the amount of available soil suitable for growing crops and fresh water available? Why?  
*Answers will vary.*
- What if the valuable top soil and fresh water, upon which we depend, would be cut in half or disappear?  
*Top soil is essential in growing crops to feed, clothe, and fuel our world. Without top soil, farmers would not be able to provide these essential needs for people. Water is needed for growing crops and for humans and animals to drink.*
- Why is it important to preserve and take care of our soil? Why is soil quality important in agriculture?  
*Taking care of our soil is important because if we do not take care of it, there is nowhere to plant crops and trees. We need crops to feed animals and humans and trees to provide many of our basic needs. Farmers strive to be good stewards of the land to protect and use soil wisely to produce food, fiber, and fuel.*
- Why is it important to conserve water? What are some ways we all can conserve water?  
*Keeping fresh water clean and usable is vital for agriculture and human consumption. We all know that we must drink water, but farmers also need to use water for crops and animals to provide food for us. Farmers are mindful of their water use and strive to use the appropriate amount of water for crops and animals, careful not to over water or under water.*

*Answers will vary. An easy way to conserve water is to turn off the water when you brush your teeth!*

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Example pie chart showing available land use:

