

# How Much Is Dirt Worth?

## *Hitting Pay Dirt*

### Objective

Students will appreciate topsoil and be able to communicate soils economic value.

### Materials

- large apple
- knife
- cutting board
- Earth's Soil Resource pie chart activity sheet

### Time

Activity 1: 15 minutes

Activity 2: 20 minutes

*Adapted from materials provided by Oklahoma Agriculture in the Classroom.*

### Teacher Preparation

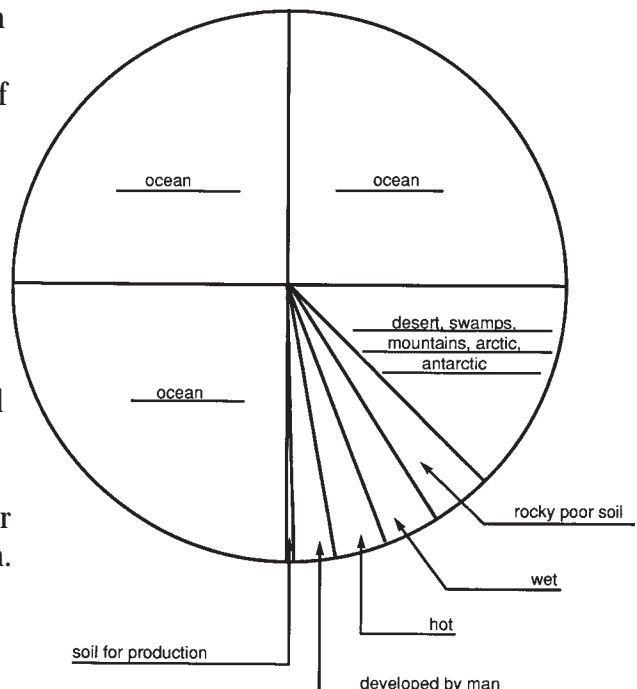
Gather materials, and make the necessary copies.

### Procedures

#### **Activity 1 - Slicing-up Earth's land resources.**

1. Demonstrate the following: Imagine that the apple is planet earth.
2. Students should fill in their pie chart as you begin to tell them what each slice means.
3. Cut the apple in quarters. Oceans occupy 3/4 of our earth. One quarter of our earth is our land area. Take this quarter and cut it in half, now you have two 1/8th sections of land. One-eighth of our land is not suitable for producing food, this is the deserts, swamps, mountains and the Arctic and Antarctic regions. The other eighth represents land where people can live. Slice this 1/8th section lengthwise into four equal parts. Now you have four 1/32nd of an apple. The first section represents the areas of the world which have rocky soil that is too poor for any type of food production. The next two sections represents land that is too wet or too hot for food production. The fourth

section represents the area of the world developed by man. Carefully peel the last 1/32nd section. This small bit of peeling represents all the soil of our earth which humans depend upon for food production.





### **Activity 2 - Cost versus Value**

1. After reading the background material. Demonstrate the following problem and scenario on the board:

Let's say you have 1 acre of land and 7 inches of topsoil. If every inch is worth \$10.00 (working with round numbers make the math a bit easier) your topsoil would be worth \$70.00.

2. Because of erosion you lose 1/2 an inch of topsoil each year. How much in dollars would you be losing each year? (\$5.00 of topsoil from an acre).
3. What is your topsoil now worth? (\$65.00)
4. Discuss what other losses would occur. (Because of lost topsoil, crops will not be as productive and your income would go down. You've lost topsoil and money!)
5. At your current rate of topsoil loss, how many years will go by before all 7 inches of topsoil are gone? (14 years)

### **Discussion**

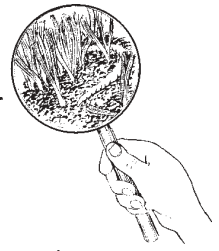
1. Since soils provide our food, how is it we can place a value on them?
2. What is an acre of pristine farmland worth?
3. How do we decide what to pay for an acre of land?
4. What can you do to minimize the loss of topsoil?

### **Background**

Agriculture is the nations largest employer. Roughly 20 out of 100 people rely on farms and farming for their livelihood. The United States exports more farm products than any other country in the world. It costs the farmer more to produce good crops on poor soil and this cost is passed on to the consumer "you" in higher prices at the grocery store.

Look at the economics or the money earned by our productive soils. Soils produce our food, keeping us alive. How do we place a value on human life? Food production or agriculture employs 20 out of every 100 people in the United States. Agricultural exports are translated into billions of dollars for United States trade. The soils on this planet are essential to our survival! Good soils are a limited resource and because it takes an average of 100 to 500 years to make 1 inch of topsoil, soil is considered a nonrenewable resource. It is difficult to place a value on our soils. The best thing to do is conserve what we have. Soil loss or erosion effects our country's economics and our lives.

Famine and economic depression is the end result of lost topsoil. So good farmers use conservation measures such as **strip cropping**, crop rotation, grassed waterways, wind breaks, **cover crops**, contour planting, terracing, and other methods to control wind and water erosion.



In Utah 5 tons of topsoil is lost each year. What does this mean? Some of our most productive soils are being lost each year. We have slowed erosion over the past 30 years, but we are still losing some of our topsoil. Fertile topsoil is what gives us higher yields or more food per acre. What will we do when our topsoil is gone? Farm the subsoil and get lower yields? That's a possibility, but that is why agricultural scientists are working hard to find out how we can sustainably grow and produce food. This area of agricultural research is called sustainable agriculture. ***Sustainable agriculture*** involves studying methods and practices to keep topsoil in its place, increase soil fertility, and use lower energy inputs to produce our food. Soil is important economically and for our very survival!

*Some good news*, half a ton of topsoil is made each year. Topsoil loss is greater than our gain, but farmers buy time with conservation methods. We still lose topsoil, just at a slower rate. The goal of farmers and researchers is to find methods whereby we lose no more topsoil than what is made. Sustainable practices such as adding compost, managing cover crops, and no-till (tillage) farming are methods currently being used and studied to save our topsoil. But really, how can we put a value on soil or land, it's kind of like placing a value on human life.

### **Vocabulary**

**Strip cropping:** planting crops in strips, several rows, alternating with other crops that have a different root type. Fibrous roots hold the soil better than crops with tap roots.

**Cover crops:** land that is planted with a fibrous root crop (like clover, various grasses, vetch, etc.) that will hold soil and is usually a legume that will add nitrogen to the soil.

# Earth's Soil Resources

