

Earth as an Apple

Purpose: Students learn about the small fraction of the planet available for growing food and strategies to protect this precious area.

Time: 15 minutes

Level: 3 (easily adapted to other grade levels)

Materials:

- World Map or globe
- One large apple
- Knife



Minnesota Math Standards and Benchmarks

3.1.3.1 Read and write fractions with words and symbols. Recognize that fractions can be used to represent parts of a whole, parts of a set, points on a number line, or distances on a number line.

Minnesota Social Studies Standards and Benchmarks

3.2.3.5.1 Explain that producing any good or service requires resources; describe the resources needed to produce a specific good or service; explain why it is not possible to produce an unlimited amount of a good or service.

3.3.3.6.1 Identify landforms and patterns in population; explain why human populations are unevenly distributed around the world.

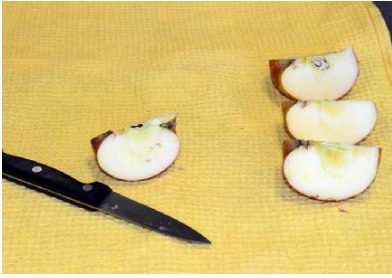
Background

Soil is one of our most useful natural resources. From the soil we get food, clothes and materials for the houses we live in. Plants rely on the soil to provide moisture and nutrients for growth. The many fruits and vegetables that we eat on a daily basis require fertile soil to grow. Trees also utilize the soil and provide valuable lumber and wood to make paper and many additional products. Our animal food also comes from the soil. Cattle, pigs, sheep, chickens, turkeys and many other animals eat grass and grain to gain muscle and remain healthy. Without these plants, which depend on soil for survival, we would not have meat to eat. The animals also supply us with other products that we need for survival or make our lives much easier. These products include medicines, leather, soaps, lotions, rubber, paint, pet food and many others.

A very small fraction of the planet contains soil available for growing food. This activity helps students to visualize the components of earth and the environmental elements that limit land use. This will lead students to understanding why agriculturalists are protective of the soil and implement conservation practices to maintain the quality of the soil.

Procedure

1. Display a world map or globe. Ask students to identify what they see – guide them to recognizing the oceans, continents, etc.
2. Ask students:
 - a. How many people do you think in the world/on earth? (7 billion – to help students understand this large number, list the population of your town, a large city – Minneapolis 350,000, St. Paul 285,000, New York City 8,000,000, the United States 310,000,000)
 - b. Where is food grown on the map or globe to feed all of these people?
 - c. Why isn't food grown everywhere?
3. Begin the demonstration to illustrate the use of the earth's land. Display your apple and ask the students to imagine the apple as the earth (or globe).



Step 4.



Step 6.



Step 7.

Soil Facts

- Most life on earth depends on soil as a direct or indirect source of food
- Plants get nutrients from soil and animals get nutrients from plants or from animals that eat plants.
- Soils form very slowly – about one inch in 100 years.
- Soil erosion is caused by the wind or water moving soil.
- Soil needs to be conserved to continue to support life.
- From 2002-2007 4,080,300 acres of agricultural land were converted to areas for homes, shopping centers, cities, etc.

4. Cut the apple in half lengthwise and then in half again so you have four quarters. Set three of these slices to the side. Ask the students what fraction of the earth these three slices would equal ($\frac{3}{4}$ or 75%). Explain that these slices represent the 75% of our planet that is covered with water – oceans, seas, lakes and rivers. Refer back to the map or globe and point out the large portion that is water. Food cannot grow in these water covered areas.
5. Cut the remaining $\frac{1}{4}$ piece of apple in half so you have 2, $\frac{1}{8}$ sections. Explain to students that $\frac{1}{8}$ of the earth or 12.5% is not suitable for humans to live. It represents Antarctica, deserts, swamps, and very high, mountainous areas. The remaining $\frac{1}{8}$ or 12.5% represents land that is suitable for human life.
6. Slice the remaining $\frac{1}{8}$ into four equal slices. This should give you four pieces that represent $\frac{1}{32}$ or 3% of the earth.
 - a. Explain to students that one, $\frac{1}{32}$ slice represents areas of earth where the soil is too rocky or poor quality to grow any food.
 - b. Explain that the second $\frac{1}{32}$ slice represents areas of earth where the soil is too wet or flooded to grow food.
 - c. Explain that the third $\frac{1}{32}$ slice represents areas that have been developed by humans into cities, roads, parking lots, etc. So this land can no longer be used to produce food.
7. You should be left with $\frac{1}{32}$ (3%) of the original apple. Carefully cut the peel off of this sliver. Display this thin peel and explain to the students that this represents all of the soil available to feed the world population of 7 + billion people.
8. Pause and let your students discuss the earth as an apple demonstration. Discuss with students the soil facts in the side bar. Also discuss with students what farmers and also all people can do to try to preserve and protect our soil.

Additional Activities

- View a animated version of this demonstration at http://www.agclassroom.org/kids/tours_apple.htm
- Have students research things that they can do to help protect our soil.
- Form “soil conservation teams.” Each team must research and demonstrate a soil conservation method used by agriculturalists.

Resources

- Soil centered video clips and companion resources are available at: <http://www.mda.state.mn.us/kids/videostories/soils.aspx>

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651/201-6000. TTY users can call the Minnesota Relay Service at 711 or 1-800-627-3529. The MDA is an equal opportunity employer and provider.

