

Earth Apple

Adapted from several sources

Overview:

By observing (or performing) the slicing of an apple, students become aware of the small fraction of the earth's limited land resources that support all human life.

Objectives:

After participating in the activity, students will be able to:

- Identify the fraction of the earth's surface that is water.
- Identify the fraction of the earth's surface that is land.
- Identify the fraction of the land area that is too cold, too dry, too steep, and too stony for cultivation.
- Deduce that only a small fraction of the earth's surface supports the majority of human life.

The purpose of this lesson is for students to understand that human life depends on a very small area of the planet and upon the thin mantle of the earth's surface, called "soil."

Background:

It is important for students to realize that the earth, the blue planet as observed from space, is almost three-quarters (3/4) water and one-quarter (1/4) land. The land area includes mountains, deserts, snow- and ice-covered polar regions, wetlands, forests, grasslands, and farmlands. All of these water and land areas are important to the plants, animals, and microorganisms making up the global ecosystems. Only a small fraction of the total land area has the quality of soil, topography, available water, and length of growing season to permit cultivation. Cultivated land areas provide the bulk of the world's food and fiber for humans.

Procedure:

You may present this as a demonstration, or give each student an apple, butter knife, and paper plate.

As you go through this brief demonstration, ask the students some of the following questions. *Answers are in italics.*

1. Show the apple to the class. "For this exercise, the apple represents the earth."
2. Slice the apple into four quarters.



Lesson to accompany Project Learning Tree's "Renewable or Not" lesson www.mndnr.gov/plt

3. Hold up three quarters of the apple. “What do these parts of the apple represent?” *Water*. “What fraction of the apple does this represent?” $3/4$ (Note: Have a globe present to confirm the amount of surface area that is under water.)
4. Hold up one quarter of the apple. “What does this part represent?” *Land* “What fraction of the apple does this represent?” $1/4$
5. Ask the students, “Can people live on all places on the land? What parts of the land are uninhabitable?” *Deserts, mountains, wetlands, polar regions*. Slice the land fraction in half. “This represents the places we can’t live on. What fraction of the earth’s surface is this?” $1/8$
6. Hold up the $1/8$ section. “This represents the land area where people can live, but not of the soil is suitable for growing food. Why?” *There are buildings, roads, polluted soil, desertification, etc.*
7. Take the $1/8$ section and divide into four pieces. Remove three of the pieces and tell the class that those three pieces represent areas of the land that are no longer suitable to grow food on.
8. Hold up the last piece. “What fraction of the earth’s surface is this?” $1/32$.
9. Of that last piece, carefully peel off the skin and hold it up. Explain that this is the relative total surface area of the planet suitable for growing food for all its people.
10. Ask, “Why is it important to take care of the land we live on?”

