

The Earth as an Apple

*Wyoming Science, Social Studies,
& Mathematics*

Objectives:

- Students will learn how much land exists on earth and the importance of land resources.
- Students will learn how much of the land is used for food production.
- Students will gain knowledge of fractions.

Background:

One of the most important natural resources that covers much of the earth's land surface is soil. Most life on earth depends upon the soil as a direct or indirect source of food. Plants obtain nutrients from it. Animals get nutrients from plants or from animals that eat plants. The content of soil is constantly changing, and there are many different kinds of soil. It forms very slowly and is destroyed easily. So it must be conserved in order to continue to support life. We are unable to use all the earth's surface for food production because it is covered by deserts, swamps, ice, mountains, or other areas not suitable for plant growth.

Soil that can be used for growing food is called arable land. Between 1992 and 1997 the number of acres used for growing crops in the US dropped by five million acres. Those used for pasture and range dropped by 11 million. Much of the land removed from agricultural production results from expanding urban development (housing, roads, etc).

Soil conservationists and farmers work together to ensure wise use of soil. Wise use of farmland involves maintaining a high level of nutrients and organic matter in cultivated soil. Farmers add organic matter to the soil by plowing under certain green plants. They also use fertilizers and rotate crops to replace nutrients that leaching and growing plants remove. Farmers also plow and plant their fields in ways that control soil erosion.

Ranchers are also careful to control soil erosion on their land by limiting the grazing on their land. Lands that have been overgrazed also suffer from erosion. Ranchers conserve grazing lands by limiting the time that their herds graze one area.

Our food producing land continually decreases as the world's population continues to increase. In the United States soil conservation is very important because they are one of the most productive countries in the world. American farmers and ranchers produce 16% of the world's food on just 7% of the world's land. The following demonstration will show how little of the earth's surface is actually used for food production as compared to growing populations.



Standards

Science

Earth, Space, & Physical Systems: 1.4, 1.6

Social Studies:

People, Places, & Environments:
5.1, 5.3, 5.4

Mathematics

3rd Grade:

Number Operations
& Concepts: 1.1, 1.2

4th Grade:

Number Operations &
Concepts: 1.1, 1.7

Materials

- Globe
- Apple
- Knife

Estimated Time

60 Minutes

Grades 3-4

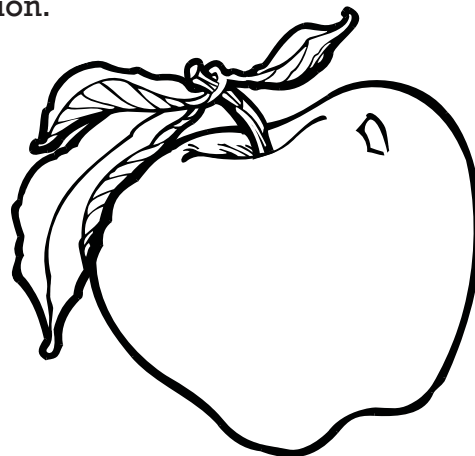
notes:

Activity Procedures:

1. Imagine the apple is planet. Ask your students to fill in the chart on the worksheet while you explain the land resources of the earth.
2. Cut the apple into quarters. Oceans occupy three quarters of our earth. One quarter of the land area is our land area.
3. Take the remaining quarter and cut it in half, now you have two $1/8^{\text{th}}$ sections of land. $1/8^{\text{th}}$ of our land is not suitable for producing food. This land includes desert, swamps, mountains, and the Arctic and Antarctic regions. The other $1/8^{\text{th}}$ represent land where man can live.
4. Slice the $1/8^{\text{th}}$ section lengthwise into four equal parts. Now you have $1/32^{\text{nd}}$ 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 section represents the areas of the world which are too wet for food production. The last section represents the world developed by man.
5. Carefully peel the last $1/32^{\text{nd}}$ section. This small bit of peeling represents all the soil of our earth which humans depend on for food production

Discussion Questions:

1. Ask students about the globe or map and let them explain; which is water? & which is land? Based on the pie chart what percentage of the earth is water and what percentage is land?
2. Let them describe what kind of different land formations exist; (mountains, valleys, and deserts – which land formations are suitable for food growth?) How much is earth's land is not suitable for food production.
3. Have students explain why having land that is usable is important.
4. Have students talk about how land could possibly be changed to be either usable or not usable for food production.



Additional Activities:

- Invite a farmer or rancher into the classroom to discuss his/her methods of soil conservation that are used on their farm or ranch.
- Invite a professional from the local Conservation Districts to discuss soil conservation techniques.



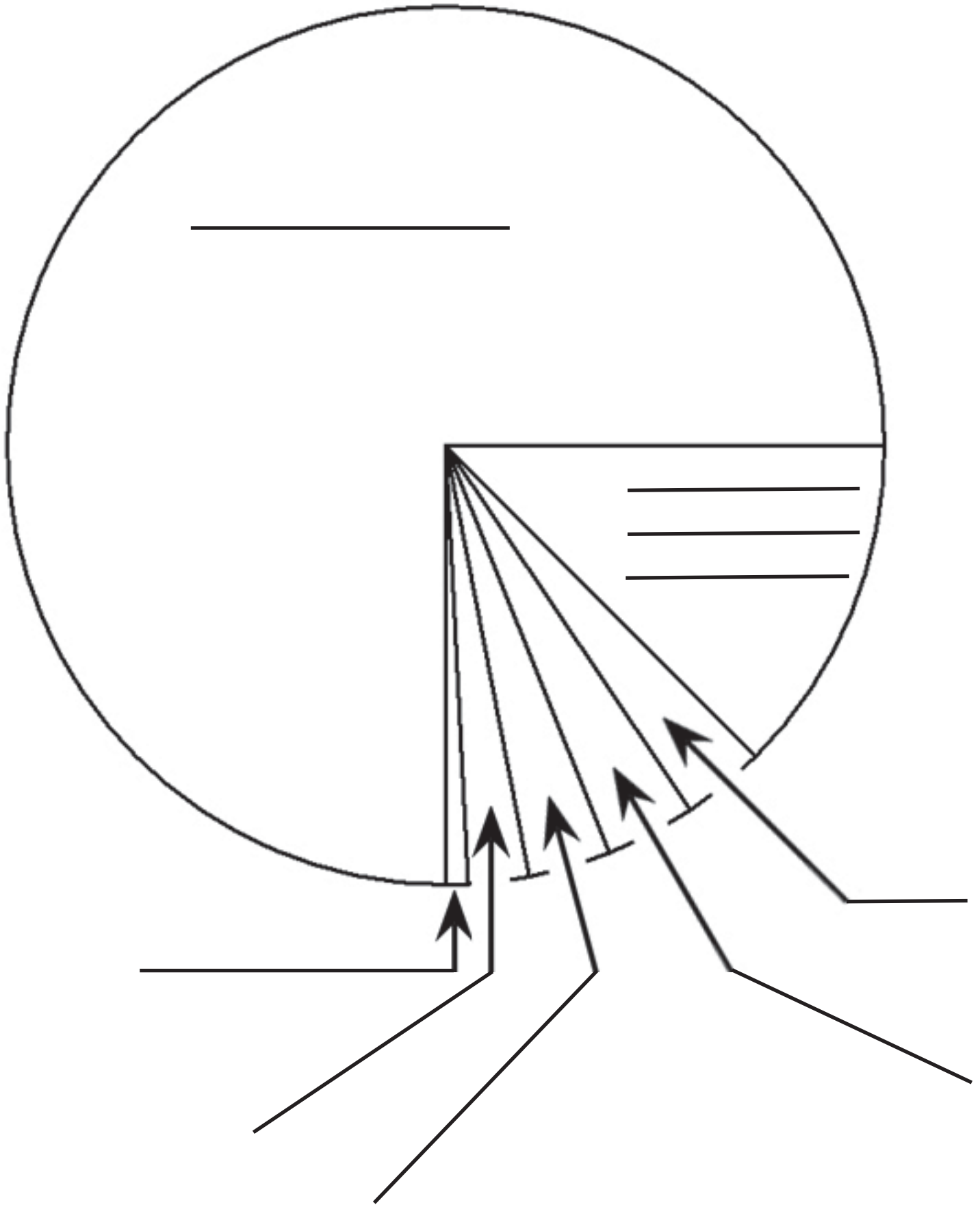
vocabulary:

- *resources*
- *range land*
- *nutrients*
- *population*
- *region*
- *conservation*
- *continent*
- *desert*
- *swamp*
- *development*

Materials Adapted from:

Illinois Agriculture in the Classroom & Oklahoma Agriculture in the Classroom

Earth as an Apple



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Cut the apple as shown below
to represent land use.

