

A Thin Slice of Soil

- Objectives:
1. The student will recognize the importance of soil in the production of everything we eat and many of the clothes we wear.
 2. The student will recognize the percentages of the earth used for food production as compared to the amount of oceans, deserts, mountains, etc. on the earth.

Grade level: 1-3 4-6

TEKS:

S- 1.9 A,B; 1.10C; S.2.9;
2.10B; 3.2 E; 3.11 A;
M- 1.2 A; 3.2 A-D

S- 4.2 E, 4.11 C; 5.5 A,B;
6.5 A
M- 4.2 A,B,C

TAKS:

GRADE

OBJECTIVES

Reading	3, 4, 5, 6	1, 4
Writing	4	1, 2, 3, 4, 5, 6
Science	5	2, 3, 4
Math	3, 4, 5, 6	1, 3

Assessment Summary:

- Materials:
1. Pyramid of Life Poster
 2. Large apple
 3. Paring knife
 4. Sample pie chart with answer key
 5. Dirt Baby instructions and material

Assessment:

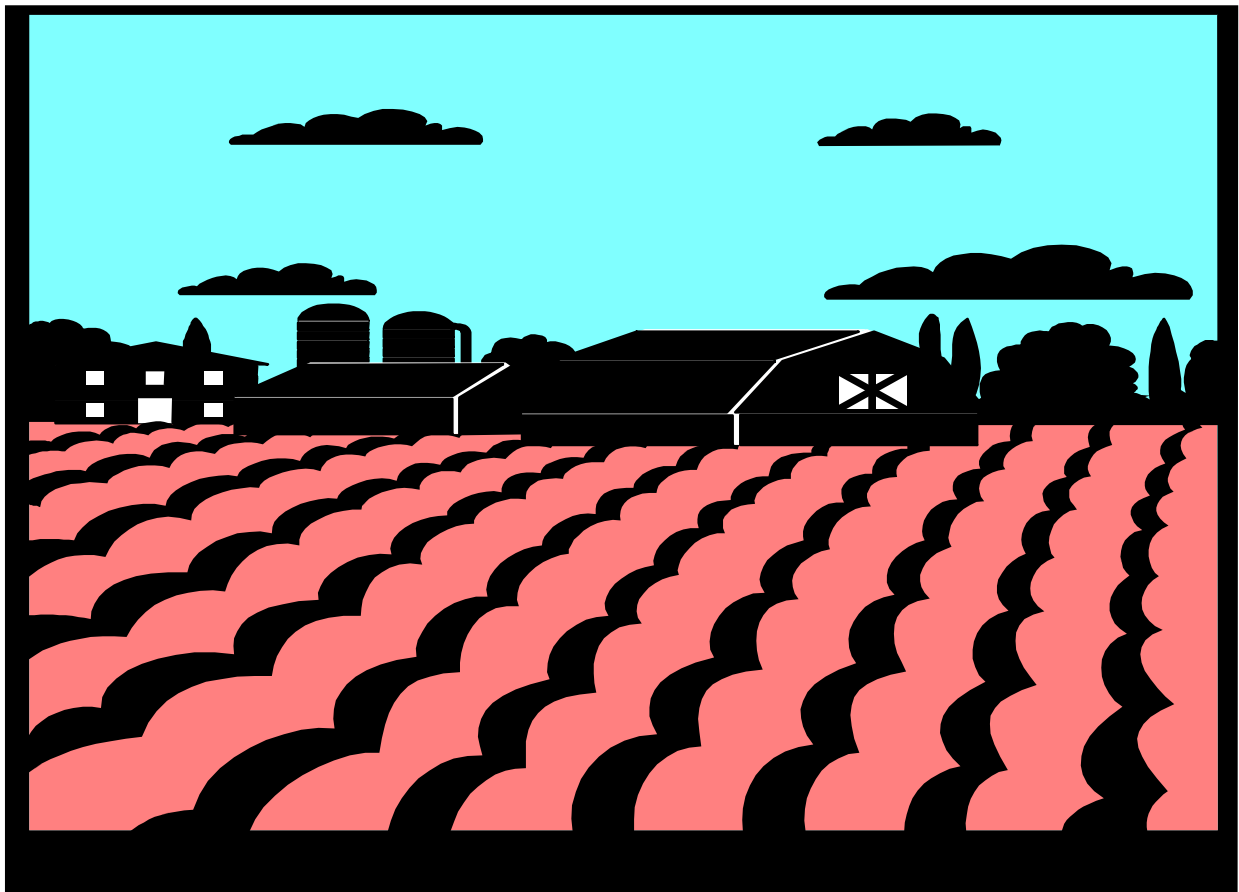
1. Have students draw a pie chart showing the different fractions that make up the earth, based on the apple demonstration. Older students can convert these to percentages.
2. Have students make their own model of the Pyramid of Life, using construction paper, pictures from magazines or their own drawings.
3. Have student write descriptive sentences, paragraphs or papers describing how we depend on the soil.

Background Information

One of our most important natural resources is soil. All living things depend on it as a source of food, either directly or indirectly. Plants depend on the soil to anchor them in place. Soil stores water and nutrients which it then makes available for plant growth. Some animals eat only plants for food. These are called herbivores. Humans eat plants, but we also use animals for food. We are called omnivores. Some animals eat only other animals. These are called carnivores. But we all have something in common. All of our food can be traced back to plants growing in the soil.

Our food producing land is a limited resource. Farmers and ranchers in the United States work hard to produce enough food to feed everyone in this country, plus a large number of people in other countries. A farmer in the United States, on average, produces enough food to feed 129 people. They realize they must get maximum production out of their soil, while at the same time protecting it for future generations.

As world population continues to increase each person's food producing portion of land is becoming smaller and smaller. This means farmers must work harder to grow more food on the land they are using. It is the responsibility of all of us to use the soil wisely, to insure a bright future.



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Lesson Plan

1. Introduce new vocabulary:

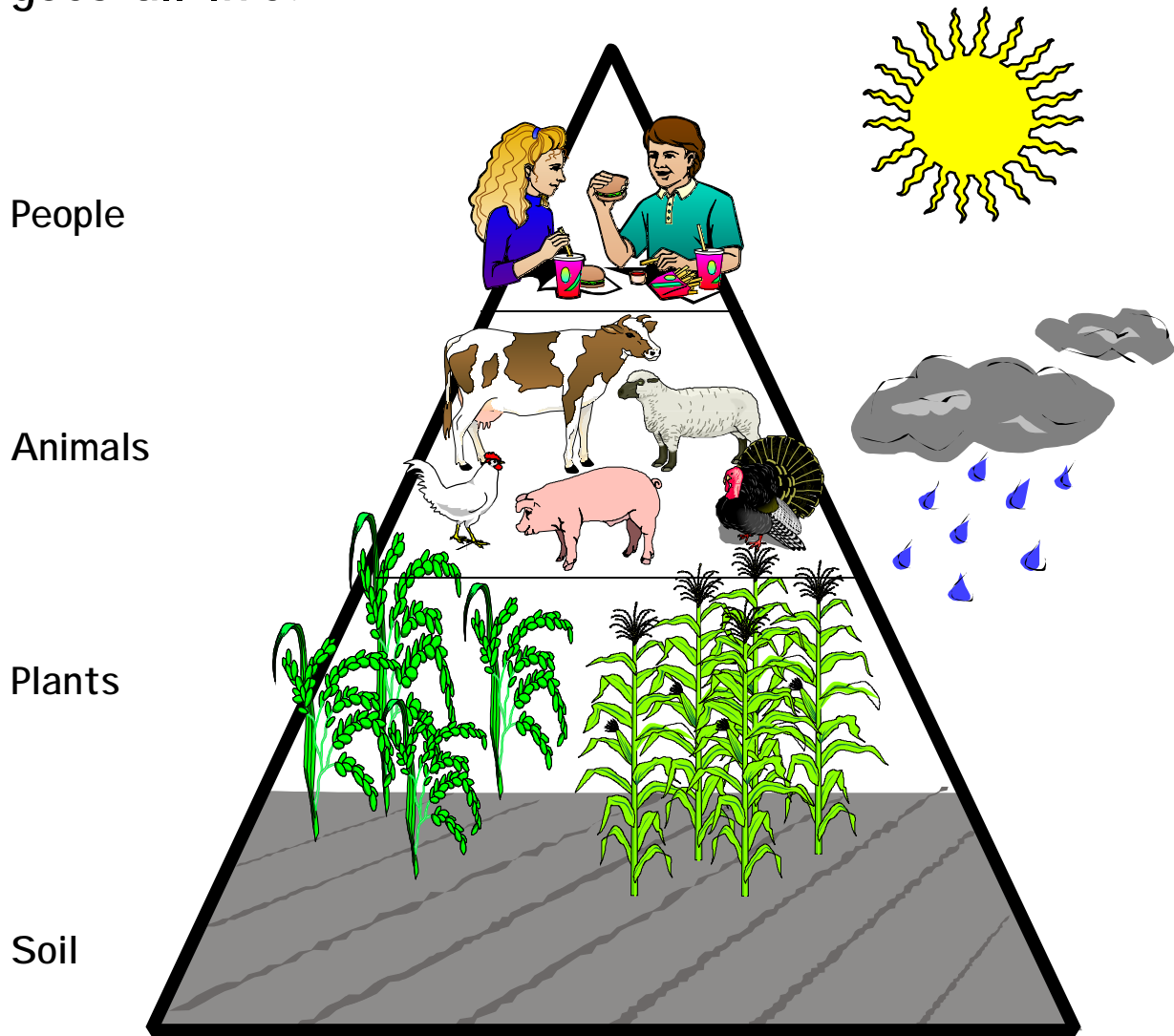
Grades 1-3	Grades 4-6
Natural resources	Herbivore
Soil	Omnivore
Conservation	Carnivore
2. Discuss how we depend on the soil while displaying the *Pyramid of Life*.
3. Cut the apple into four equal parts. Three parts represent the oceans of the world. The fourth part represents the land area.
4. Cut the land section in half lengthwise. Now you have two one-eighth pieces. One section represents land such as deserts, swamps, antarctic, arctic, and mountain regions. These regions are not suitable for man to live.
5. Slice the remaining one-eighth section into four equal parts. Three of these one-thirty second sections represent the areas of the world which are too rocky, too wet, too hot, or where soils are too poor for production, as well as areas developed by man.
6. Carefully peel the last one-thirty second section. This small bit of peeling represents the soil of our earth on which mankind depends for food production!
7. Discuss what this soil is used for. Possible questions:
 - S What if this valuable top soil upon which man depends should suddenly disappear?
 - S What must happen to the amount of food farmers grow if the world's population continues to increase while our earth's top soil remains the same?
 - S Have the students make a pie chart depicting the portion of land used to grow our food versus all the other areas of the world such as water or land regions. (Refer to Answer Key).

Additional Activities:

1. Have students do "Dirt Babies" activity.
2. Invite a representative from your local Natural Resources Conservation Services office into your classroom to discuss what special things are being done to conserve the soil.
3. Use the Internet to visit the NRCS web site:
www.tx.nrcs.usda.gov/soil/index.html
4. Earth as an apple:
www.farmland.org/what/apple_movie.htm

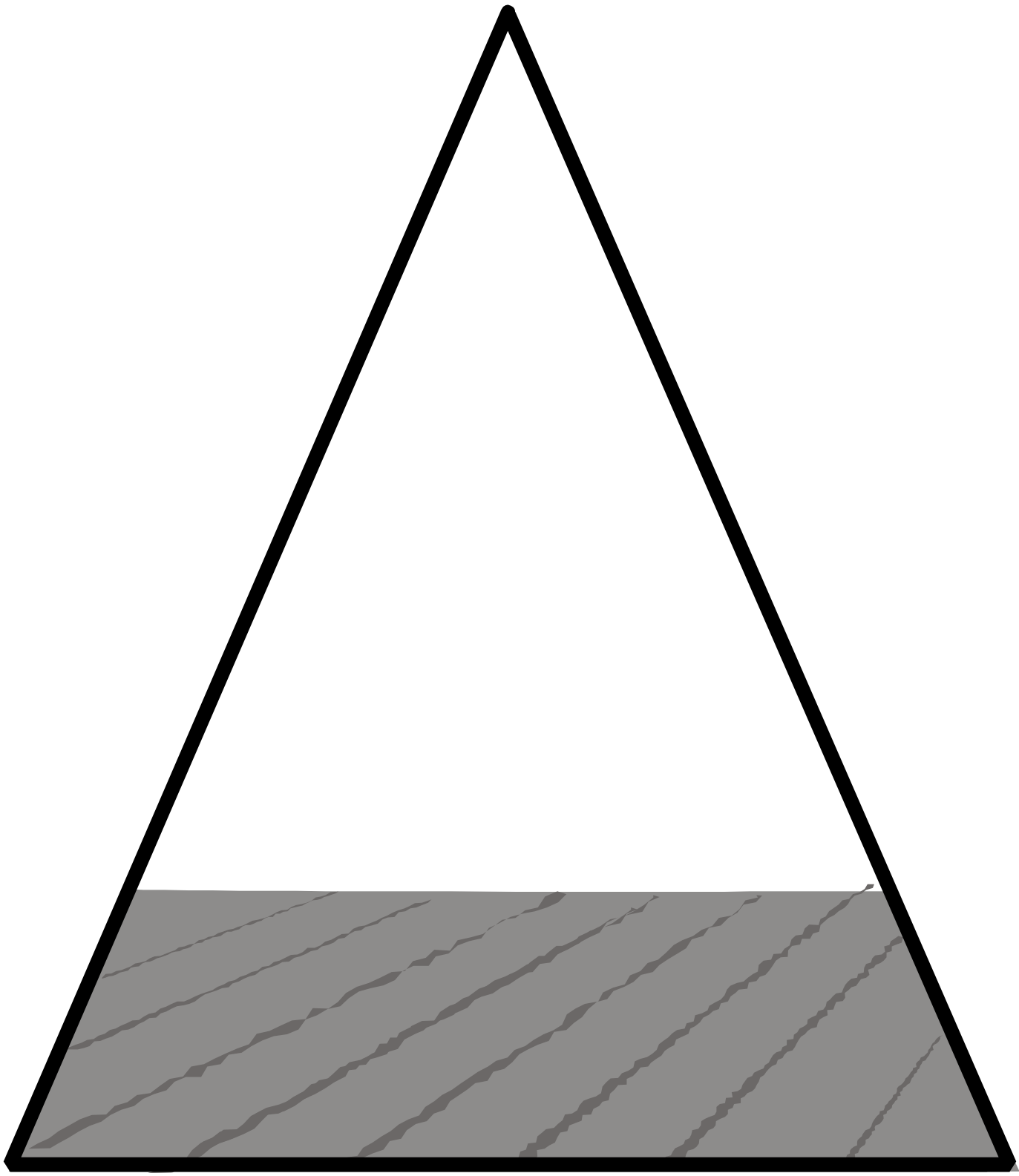
The Pyramid of Life

The foundation is soil, that along with sunlight and rain produce plant life. All animals depend on plants directly or indirectly for energy. Man should know that all life depends on the soil: as the soil goes, so goes all life.



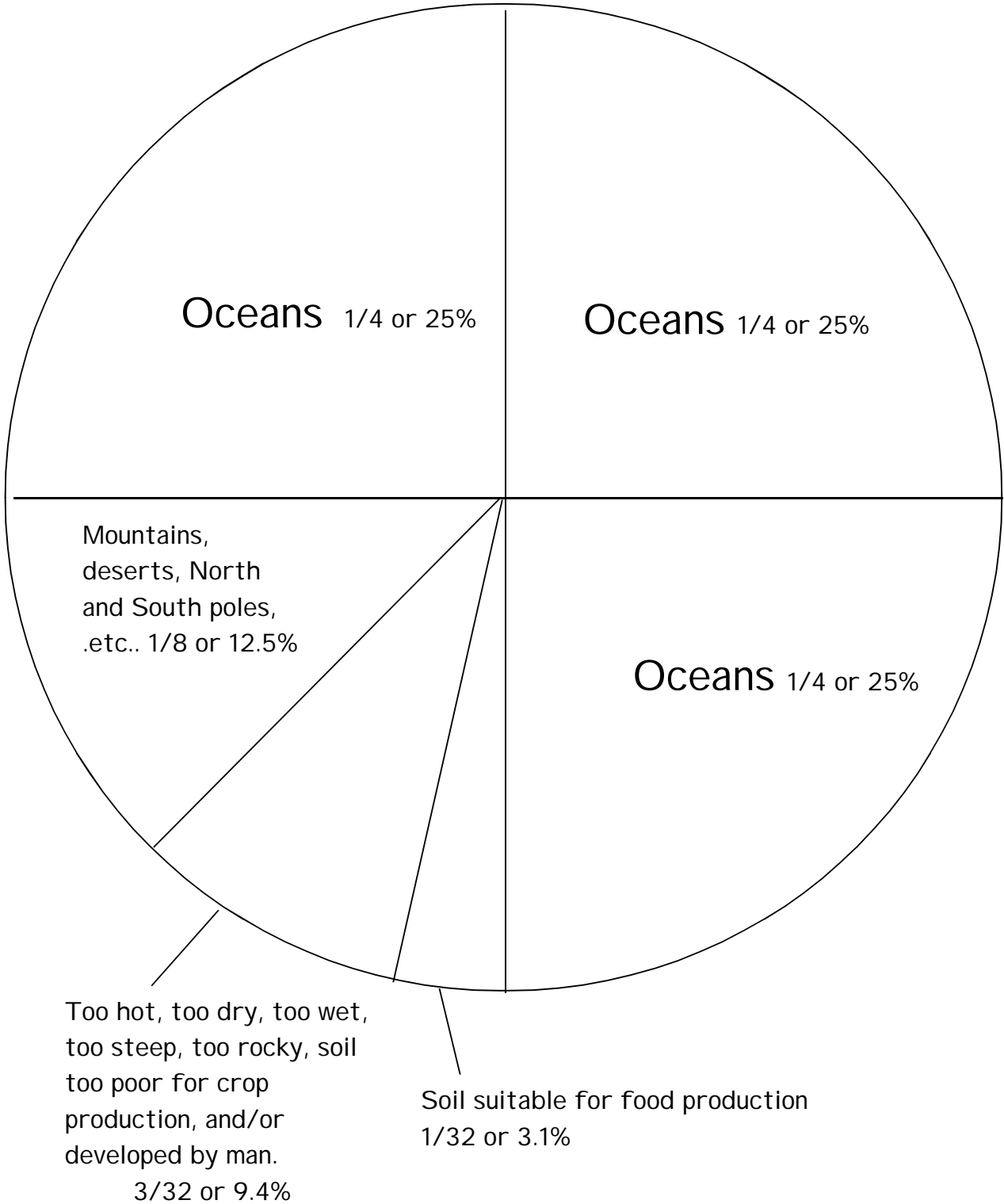
Texas Farm Bureau, 1999
Adapted from Boy Scouts of America

Make your own Pyramid of Life using pictures you cut from magazines.



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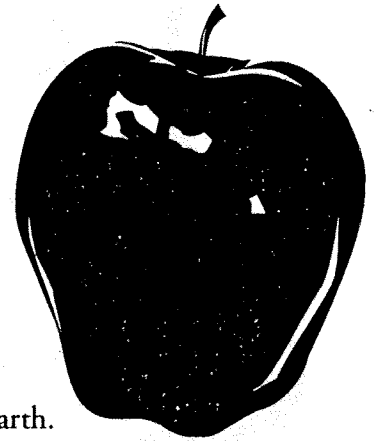
Areas of the Earth's Surface



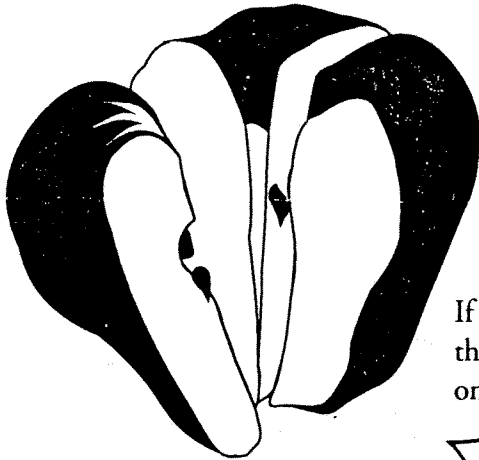
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The Earth As An Apple

Today the world's population is 6.25 billion and increasing, but the amount of land we have for growing our food supply is not! This means that it will become harder to grow food for everyone on Earth.



Imagine this apple represents the Earth.



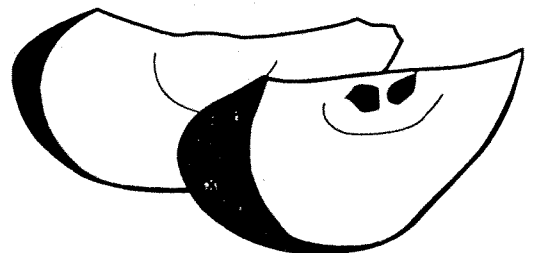
step 1

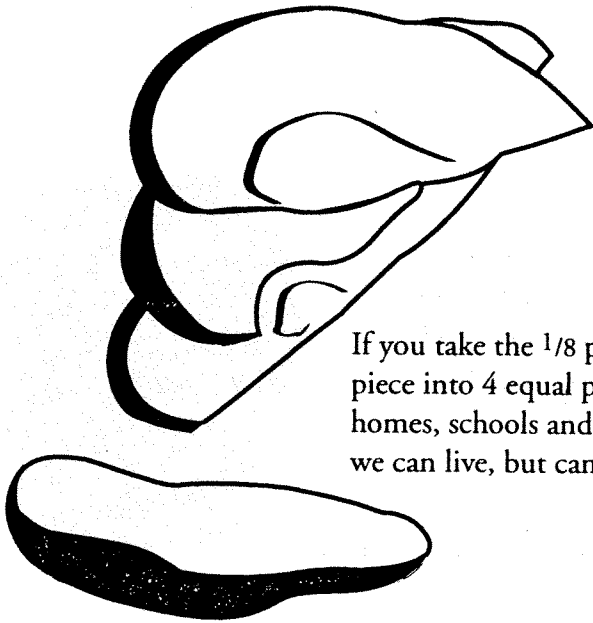
If you cut the apple into four equal pieces, three of those pieces are covered by water. Only one of the pieces is land, or $\frac{1}{4}$ of the Earth!



step 2

If you slice this piece in half, you get two pieces that are each $\frac{1}{8}$ of the whole apple. One of these pieces represents the land that people can live on. The other piece represents deserts, mountains and forests where people do not live.





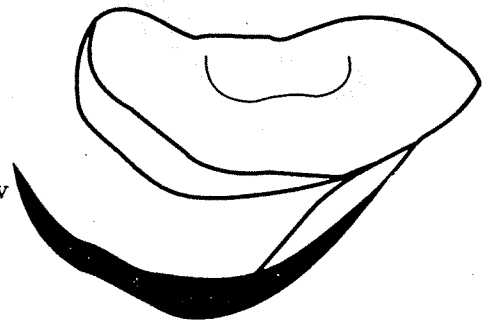
step 3

If you take the $\frac{1}{8}$ piece that represents the land where we can live and cut this piece into 4 equal parts. Three of those $\frac{1}{32}$ pieces are for cities and towns, homes, schools and shopping malls and suburban developments—places where we can live, but can't grow food.

step 4

All that is left is this tiny piece—this is $\frac{1}{32}$ of the whole earth.

Take this last piece of apple and carefully peel off the skin. This tiny piece of skin represents the farmable land or topsoil layer where we grow our food.



Our land is a precious resource. Scientists and farmers, by using technology, are producing more food. But, with a fixed amount of food-producing land and an ever-increasing number of people, we need to continue looking at different methods to grow food. It is also necessary to protect the environmental quality of our air, water and land.

Dirt Babies

Materials Needed

- ! Knee-high hosiery
- ! Planting medium
- ! Grass seed
- ! Tall baby food jar
- ! Felt, fabric, pom poms, jiggle eyes, and other materials to make features for the face
- ! Glue gun

Background

Of all plants, grasses are the most important to the diet of humans. Corn, wheat, oats, rye, barley, rice, even sugar cane are all grasses. Before people were here, much of Texas was covered with grass that grew taller than most adults. Because there were few trees here, the early settlers thought the land was no good. They were wrong. Grasses can stand environmental extremes that kill trees. So the grasses these pioneers saw were uniquely adapted to the multitude of soil, temperature and precipitation variation and combinations present on the plains of Texas.

Most people who live here now grow grass in their yards. Grass makes things cooler in the summer and keeps out dust in dry weather and mud when it rains. Grass will keep growing back after it is cut, as long as it is not cut too short. About 100 years ago most lawns were "clipped" by cows, sheep or horses pastured close to the house, or by hand shears or scythes.

Instructions

1. A few weeks ahead of time start your own dirt baby so students will know what it will look like.
2. Ask students if they have ever helped with yard work, mowing or raking grass. How often do they mow? Share background.
3. Show students the dirt baby you have grown. Ask students to guess what it is made from.
4. Ask students how hair is like grass. How is hair different from grass? What does grass need to make it grow? What does hair need?
5. Have students place a generous pinch or two of grass seed in the toe of the hosiery, pack a handful of soil on top of the seed, and tie a knot in the hose under the ball of soil.
6. Students should then flip the baby over so the grass seed is on top and the knot is on bottom.
7. Help students make faces for their babies using the materials you have provided. Students may also dress their babies by cutting a round piece of fabric to fit over the mouth of the jar. The clothes can be decorated with lace or other material.
8. After students have finished decorating their dirt babies, have them fill the jars halfway with water and rest the babies head on the lip of the jar. The end dangling from the knot should hang in the water. Have students check their babies every few minutes and observe how long it takes for the head to become saturated. How much of the water remains in the jar?
9. Have students add water as needed. In 10-15 days the seeds should germinate through the hose. After the "hair grows to the desired length, students may cut and style it as desired.
10. Have students write a story about their dirt baby.

Oklahoma State University Division of Agricultural Sciences and Natural Resources