

Apple Earth

Standards of Learning

Science 1.1, 1.8, 3.1, 3.7, 3.9, 3.10, 4.1, 4.9

Social Studies 2.7

Objective

Students will:

- Understand that natural resources are limited
- Discuss the importance of managing natural resources
- Identify the effects of humans and weather on land

Materials

- An apple
- A knife

Background Knowledge

How much of the Earth's land is available to feed, clothe, and fuel the world's population? Explore this question as well as the importance of soil as a natural resource in "Apple Earth."

Farmers are keenly aware of the importance of soil and its value as a natural resource. Thus, they may adopt one or several ways to protect the soil. Examples include conservation tillage, wind breaks, contour farming, and crop rotation. As the population increases, vital cropland is being covered and lost from production. Thus, today's farmers must find ways to be more efficient and produce more food on less land, especially as it is projected that the world's population will reach 9 billion by 2050. In the 1960s, one farmer supplied food for 25.8 persons in the U.S. and abroad. Today, even as the population increases but the number of farms decreases, one farmer supplies food for 166 people in the U.S. and abroad. Modern technology that creates farming efficiency is crucial to generating a food supply to sustain the growing world. In order to feed 9 billion by 2050, the world's farmers will have to grow about 70% more food than what is currently produced.

Procedure

1. Cut the apple into four equal parts and do the following:
 - Remove three parts –
These three parts represent the portion of the earth covered by water. Locate the Earth's oceans on a map.
 - The part that is left, one-fourth of the earth, represents land.
2. Cut the remaining portion (quarter) in half lengthwise and do the following:
 - Remove one part – This half represents areas of Earth where plants we eat can't grow because the climate is too hot or cold. What places are too hot? (identify major deserts) What places are too cold? (identify the poles and places where the ground is frozen).

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Apple Earth

Procedure continued:

3. Cut the remaining portion crosswise into four equal parts and do the following:

- Remove three parts –

These three parts represent land that is too rocky or steep, too marshy, or where something has already been built.

The fourth part – only $\frac{1}{32}$ of the earth – represents the land that can be used for growing crops to sustain more than seven billion people and all of the billions of animals in their care.

4. Ask students if we can grow plants all the way into the core of the earth. Once they have identified that this is not a possibility, discuss what part of the earth we do use for planting and growing crops (topsoil on the crust of the earth).

5. Peel the skin off of the remaining section and do the following:

- Show the skin –

This tiny piece of the apple represents the topsoil – the part of the earth where plants grow.

This small amount of soil is important for growing all of the food needed to feed all of the people and animals on our planet.

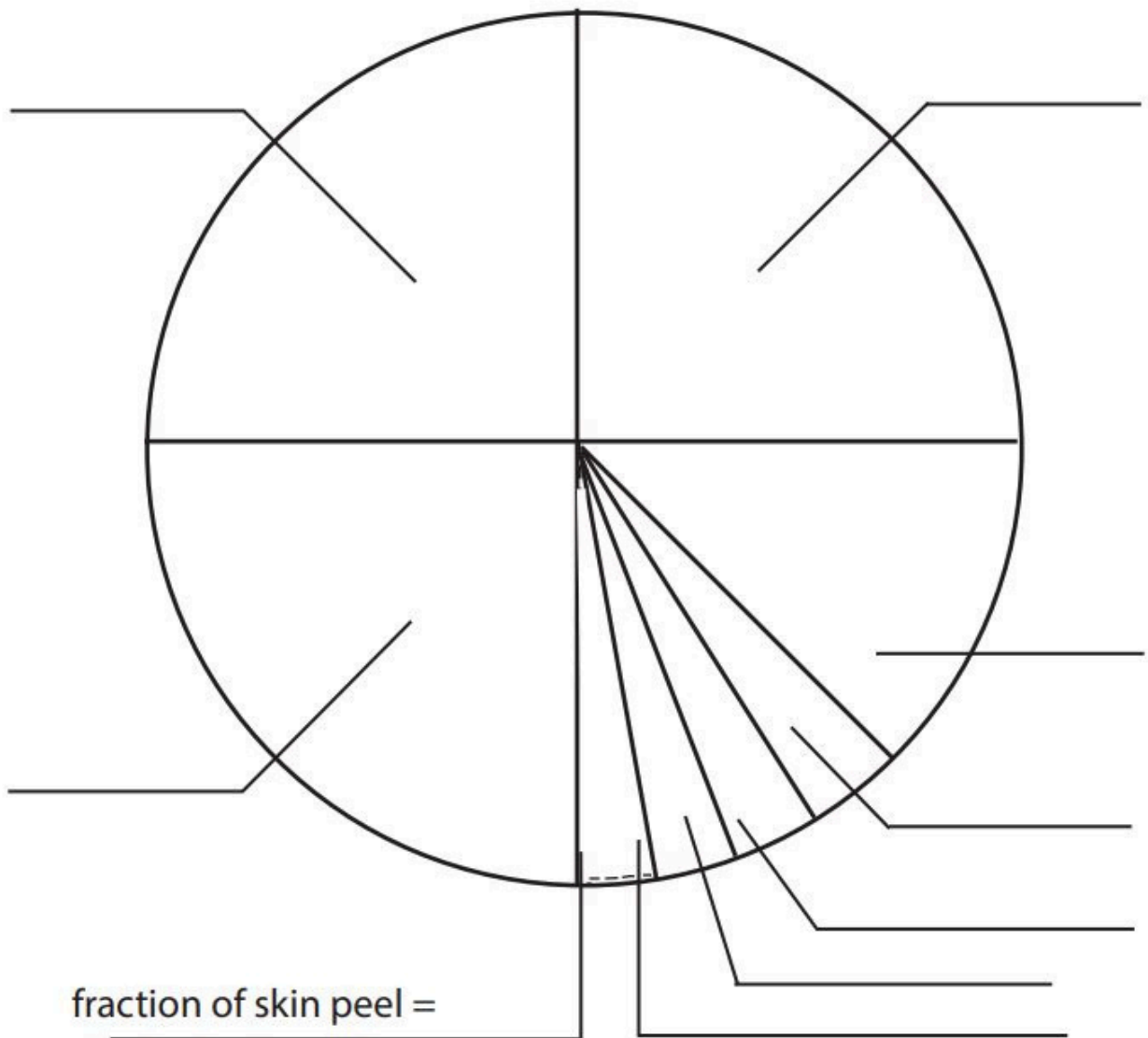
6. Discuss the importance of soil conservation and ways that erosion can be prevented.



Name _____

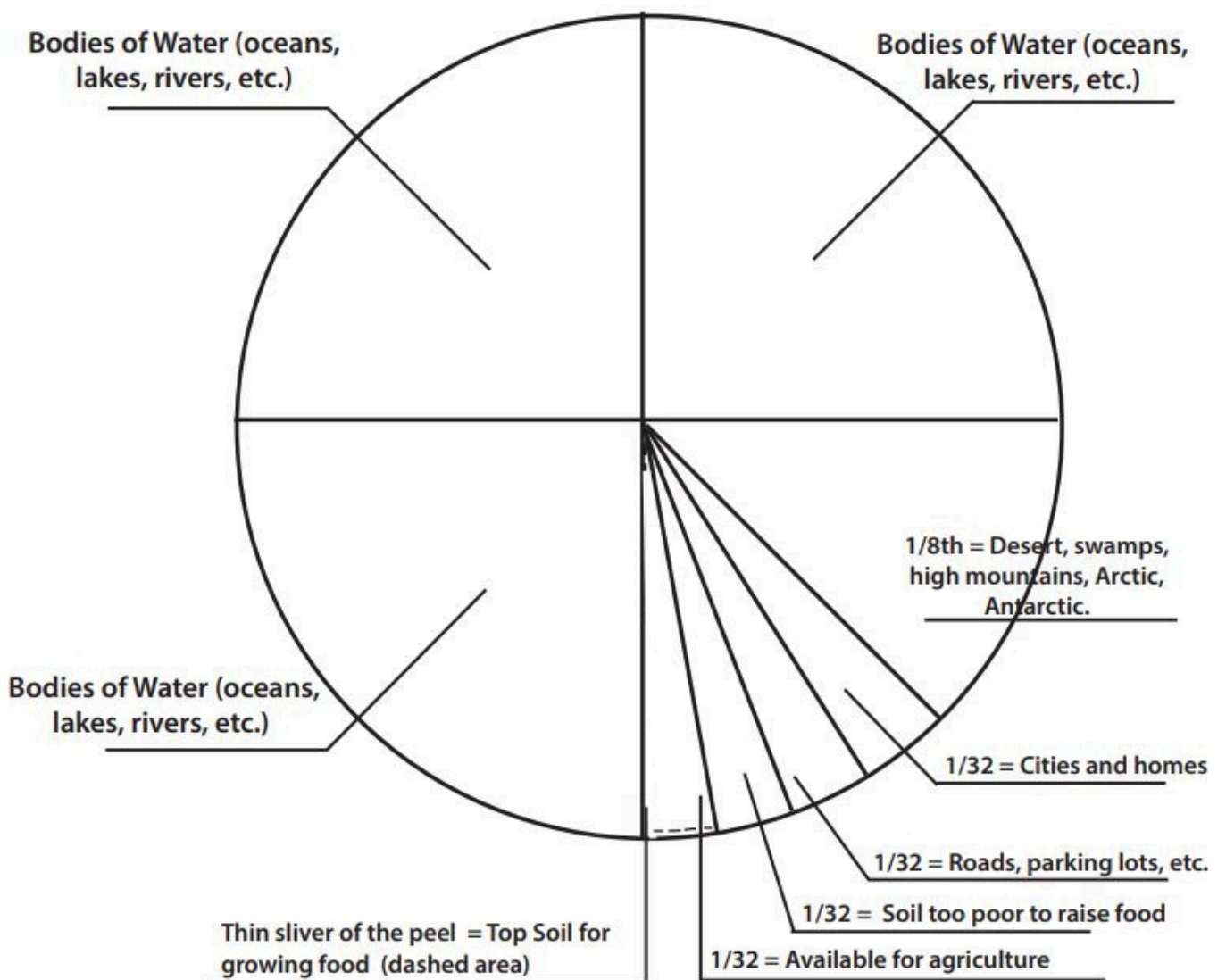
The Earth as an Apple

Directions: Label the segments of the graph, using the information from the teacher's demonstration. When you are finished, color the graph, using a different color for each segment.



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Elementary School Math Extensions

Math Standards of Learning: 1NS3, 2NS3, 3NS3, 4NS3

As the apple slices are cut into fractions students can demonstrate their knowledge by:

- writing the fraction
- showing the fraction with fraction strips, pattern blocks, fraction rods, number lines, drawing, pie pieces, other available materials
- comparing the fractions used in the apple earth demonstration ($\frac{1}{4}$ vs $\frac{1}{32}$ and so on)
- listing the fractions of the apple and then ordering them least to greatest; greatest to least

Modifications can be made depending on the academic needs of the students

Middle School

Standards of Learning: Science 6.9, English 6.1, 6.7, 7.1, 7.7, 8.1, 8.7

Students will demonstrate their knowledge of human impact by choosing an idea from the strand and writing about how why:

- *natural resources are important to protect and maintain;*
- *renewable and nonrenewable resources can be managed;* and so on

Students may work individually, as partners, or small groups to engage all portions of the writing process to complete a written answer and present it to their peers.

High School

Standards of Learning: English 9.6, 9.8, 10.6, 10.8, 11.6, 11.8, 12.6, 12.8

Students will demonstrate their knowledge of their community by discussing these questions in a written response or media presentation:

- *Are there examples of agricultural land in your community or examples of agricultural land you've seen somewhere else? Be descriptive in what these spaces look like and how they are used. How do local community member benefit from the agricultural land?*
- *Research local and state laws concerning agricultural land. What is your opinion of that law? Explain your stance. Discuss any changes you would make to the law and why.*

