



ELA Common Core Content Standards

Writing Standards 1, 4

Speaking and Listening Standards 1

Language Standards 2, 4

Estimated: Two sessions or one morning/afternoon

Goal: Research the responsibilities and work of a Tribal Natural Resources Department.

Background: Wise management of tribal lands and natural resources is very important for the future of American Indian communities. Tribes depend on these resources to sustain their cultures and economies long into the future. Tribal leaders know that land and natural resources are at risk of degradation and there is a need for good management to protect and restore those resources.

Each tribe has its own unique and special natural gifts. Examples of staple foods distinctive to indigenous tribes include the following: Alaska Natives have the caribou, Great Plains tribes have the bison, in the Great Lakes region there is wild rice and maple syrup, while Coastal tribes have salmon, deer and elk. These resources, as well as so many unique food, fiber and medicinal materials, are the foundations of each tribe’s Native food system.

Indigenous peoples all over the globe have practiced resource management for millennia. Our local landscape can be described as the manifestation of historical processes – both natural and cultural. Using the accumulated knowledge founded on centuries of careful observation and experimentation with the natural, and in honoring the spiritual world, the Karuk People have worked together with natural processes since time immemorial to shape this land into one of the most biodiverse landscapes on the planet.

Nowadays, tribal leaders, department staff, cultural practitioners and collaborative partners work hard to protect, sustain, and enhance natural resources. Students can learn from natural resource managers and cultural practitioners about the natural resources of their tribe and the projects and activities that are in place to protect and sustain them.

Theme/Big Idea: Taking care of our environment is also taking care of ourselves

Big Questions: What are natural resources, and what can we do to help protect, maintain and enhance them?

Vocabulary: caretaker, custodian, guardian, steward

Materials:

Karuk Department of Natural Resources, excerpt adapted from the Eco-Cultural Resources Management Plan for this lesson (included)

People of the Klamath: Of Land and Life (available from Shenandoah Films)

“A Slice of Planet Earth” by Michigan State University (included for optional activity)

Preparation:

Copy **Karuk Department of Natural Resources** for each student, or prepare document reader to project for reading as group preparation to guest speaker.

Arrange for a staff person from the Karuk Tribe’s Department of Natural Resources to speak to the students about what the Tribe does to protect and repair tribal lands and natural resources. Ask the presenter to talk about what natural resources are located in the community and what the Tribe is doing to preserve them. Let them know that the class will be preparing questions based on the lesson text **Karuk Department of Natural Resources**. Ask the staff person to present a map of the Karuk Ancestral Territory or bring photographs to show students in order to support discussion of the Tribe’s natural resources (if possible).

Developing Background: Begin this lesson by introducing terms that can be used to describe someone who takes care of the environment: *caretaker, custodian, guardian, steward*. Explain to the students what environmental stewardship is and the activities involved in protecting and preserving the environment. Contrast this idea with the idea of radically changing the environment to fit our needs today without thinking about the future.

Pass out copies of **Karuk Department of Natural Resources** to each student or magnify text on board with a document reader. Explain to students that it is often very helpful to prepare for a guest speaker by researching about their topic ahead of time. That way, they will not only be more familiar with words that may come up in the discussion, but also give participants time to write down questions that they would like to ask the speaker.

Reading: Have students take turns reading the text, stopping to clarify meaning of difficult words. Some project-specific terminology may be good for students to highlight in order to ask the speaker to clarify later. When the class has finished reading the text, assign or ask for volunteers to develop questions that they would like to ask the speaker.

Preparation for presentation: Choose one student to introduce the speaker to the class. Make sure students are ready with their questions, but also advise them that if the speaker does not talk about the topics you expect, students may need to adjust their questions to the actual topics covered. Remind them to be very respectful of the presenter.

Presentation: Ideally, staff from the Natural Resource Department will visit your class. Ask the presenter to describe the various natural resources found on tribal lands and how these relate to community health and traditional cultural activities. You might ask the representative explain their

job duties in relation to these tribal natural resources, and/or have the guest speaker engage students in a discussion about what the students can do to help the department and the Tribe. Don't forget to leave time for a question and answer session.

Follow-up to Presentation: Ask students to brainstorm a list of the natural resources they learned about today. Write their ideas on a large poster board. For each resource listed, ask them if it is used as a food source, economic source, cultural resource, or other.

Writing: Students choose one of these resources and write an opinion piece on why it is important to the Tribe. Include information on where the resource can be found, how plentiful it is, and what it is used for.

Have the students write letters to the Natural Resource staff person thanking him/her for their time and role in keeping tribal lands healthy. In the letters, ask the students to include descriptions or drawings of what they learned from the staff member. Collect these letters, review them, and mail them in.

Film: Show part 2 of the movie "People of the Klamath: Of Land and Life." Lead a discussion about the Doctor Rock land use conflict and how it was resolved.

Optional

Illustrate the scarcity of natural resources using "A Slice of Planet Earth" lesson plan.

Go on a walking fieldtrip and identify some of the natural resources that have cultural, economic, or other significance.

Evaluation: Assess the student's ability to listen respectfully to a classroom guest. Through their questions and thank you letters, assess their comprehension of what a Natural Resource Department does and the meaning of stewardship.

Resources:

Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan
http://www.karuk.us/images/docs/dnr/ECRMP_6-15-10_doc.pdf

"A Slice of Planet Earth", Michigan State University Extension,
<http://web4.msue.msu.edu/msuewc/kent/yourland/docs/earth.pdf>

Karuk Tribe Department of Natural Resources

The overarching goal of the Department of Natural Resources (DNR) is to integrate traditional practices into current land management methods, as outlined in its Mission Statement: to protect, enhance and restore the cultural/natural resources and ecological processes upon which Karuk people depend. Natural Resources staff ensure that the integrity of natural ecosystem processes and traditional values are incorporated into resource management strategies.

I. Introduction, from the Department Director, Leaf Hillman: *“I am honored to serve as the Director of Natural Resources and Environmental Policy for the Karuk Tribe. The history of the Karuk DNR began over 25 years ago with the establishment of a Karuk Fisheries Department. The fundamental principles upon which the Department was built can be summarized in two simple statements of fact. We are Karuk people, this is our home, we are born on this land, reside on this land and are buried on this land, like countless generations of Karuk’s before us, stretching back to the dawn of time. We are not visitors to this land, we are a part of the land and the land is a part of us. We are known as “fix the world” people. We are the caretakers of this land and must continue our struggle to carry out our duty. We must work hard, live good lives, and have faith in the sacred teachings and life-ways of our ancestors.*



“Our prayers and ceremonies are for the benefit of all people of all colors, around the world. We understand that the natural world - the fish, the rocks, the trees - are our relations since at the beginning of time we were all spirit people. Although the creator transformed us into different things, we are still brothers and sisters. To us, it is a natural thing to act as stewards of the environment. Taking care of the fish is just as natural to us as taking care of our elders or our children.

“Slowly, others around the planet are beginning to make similar connections, and are beginning to understand that indeed, we are all connected. As community leaders step up around the globe to defend their communities and share their ideas, changes are taking place at the national and international levels. I am optimistic that together we can overcome the great challenges facing all of us. We will need a new generation of strong, fearless, energetic, and visionary leaders to emerge and accept the responsibility to make change.”

II. Department Divisions: The Eco-Cultural Resources Management Plan (ECRMP) outlines an approach reflective of the DNR mission. Within the plan, fourteen program areas are identified:

Air Quality: There is a need to protect local communities within Karuk Ancestral Territory from long-term exposure to smoke and dust from frequent catastrophic wildland fires. There are research and development needs related to air quality monitoring, as well as education and outreach to local communities regarding the science behind traditional fire management, policies, and practices as related to effects on air quality.

Tribal Historic Preservation Office (THPO): The THPO aims to preserve our cultural, ceremonial, and sacred heritage, along with archaeological, sacred, and gathering locations and other traditional cultural properties of the Karuk People. To this end, THPO organizes certification training for Cultural



Monitors, advocates for and dispatches Tribal Monitors to construction sites, as well as informs Resource Advisors that counsel inter-agency actions in wildfires.

Cultural Resources: For the Karuk Tribe, cultural resources are synonymous with natural resources and, therefore, the management, protection, preservation, and promotion of continued access to cultural resources by Karuk Tribal members is a fundamental function of all programs of DNR.

“One of the best things about being an Archaeological Technician is getting to walk our land, spending time in places within our ancestral territory, some which are unfamiliar, and others which we are able to see with new eyes. Our job allows us to spend time getting to know these places, the plants, and animals, and thinking about the ways our people have used the land since time immemorial. Doing this work as Karuk people is especially important because of our investment in protecting the land and its resources, which are naturally linked to the wellbeing of our communities. It is empowering to be able learn every day from these places.” –Vikki Preston and Analisa Tripp, Archaeological Technicians

Restoration Forestry: Forestlands within Karuk territory have been severely harmed by large-scale timber production, single species management, road building, massive fuel loading, and fire suppression. DNR seeks to repair the natural forest processes and historic forest composition that promote biological diversity and a functional ecosystem.



“It is my belief that the best way to manage and protect our landscape and resources is and has always been to do it in a manner consistent with Karuk tradition, custom, culture and ceremonial principal. The best thing about my job is that I get to practice what I believe – every day.”
- William A. Tripp, Deputy Director of Eco-Cultural Revitalization

Environmental Education: Karuk traditions, such as basket weaving, fishing, hunting, and gathering, are still practiced by Tribal members. It is important to the Tribe that such traditional knowledge be passed down and preserved. Opportunities for environmental education are built into several programs, including Water Quality, Food Security and Fisheries.

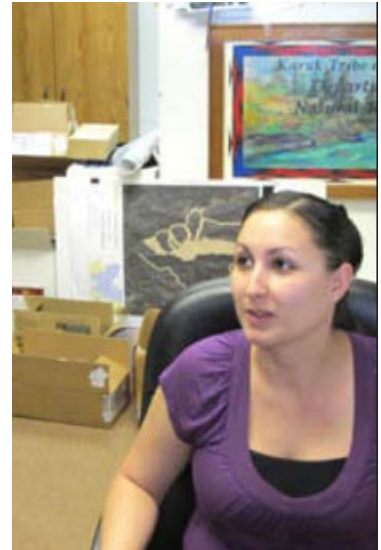


“Going into our local schools and taking students out into the field – that’s the most important thing in teaching traditional ecological knowledge. I really love being able to facilitate that for the Karuk community.” –Carlotta Whitecrane, Environmental Program Specialist

Enforcement/Regulation: DNR works toward developing necessary legal documents to enable management of natural/cultural resources according to Karuk law, for example a Tribal Fishing Ordinance has been drafted to regulate the tribal fisheries. Additional plans to develop: managing elk and/or deer hunting regulations, monitoring water quality, establishing a Water Pollution Control Ordinance, and developing a Firewood Cutting Ordinance relating to a Forest Management Plan.

Fire & Fuels Reduction: Karuk people have used fire as a primary tool for landscape management since time immemorial. The Wildland Fire Program is principally concerned with protecting life, property, and cultural/natural resources from uncharacteristically intense wildland fires. It is the Tribe’s intention to achieve this by restoring traditional fire management practices on a landscape scale within Karuk ancestral homelands and implementing restorative forestry practices.

“Enabling our fire crews to help prevent and respond to wildland fire is a major part of my job. Facilitating traditional fire activities is especially gratifying – not only are federal and state agencies finally recognizing the Tribe’s wisdom on these practices, they simply make sense. I love being a part of that, and I feel really good about the fact that The Wildland Fire Program helps employ our local tribal community.” – Tawnia Johnson, Administrative Support Assistant



Fisheries: This program works to protect fisheries resources - a staple food source of the Karuk people. Fisheries resources are valued by tribal people for food, traditional practices (way of life), and is a keystone indicator for community health and well-being.

“What I love about my job is that it connects our ceremonies to management, and that’s the foundation of our world view. I have a great opportunity to help fulfill those obligations and responsibilities inherent to the Karuk People.” – Ron Reed, Cultural Biologist



Natural Resources Policy Advocacy and Environmental Justice: Advocacy for laws and policies that promote traditional Karuk management of its ancestral territory is essential to the health of its natural resources. Important examples of this are the continued pursuit of Karuk federally reserved fishing rights, removal of the Klamath dams, and implementation of traditional fire management regimes.

“Karuk People are passionate about protecting the river, the forests, and the natural resources they depend on. I love my job because I take that passion and turn it into political action in the halls of government.” – Craig Tucker, Natural Resources Policy Advocate



Solid Waste: This program area includes the development and implementation of an Integrated Solid Waste Management Plan (ISWMP), which aims to evaluate the types and amounts of wastes generated by the Tribe’s activities, target waste reduction and recycling, identify options for sustainable alternatives, and implement changes as able.

Soils/Minerals: The purpose of this program area is to monitor, evaluate and restore areas harmed by mining activities and other soil disturbances, as well as promote the effective regulation of mining as a means to protect water quality, cultural sites, fisheries, and ceremonial areas.



Watershed Restoration: The purpose of this program is to identify, plan and implement site-specific projects on a landscape level that have long-term benefits to aquatic and terrestrial resources.

“What I really enjoy about my job is being out with Creation, reconnecting with the original Spirit People, and learning from my surroundings. When one is out in the woods as much as I am and has an open heart and spirit, those old ways will come back.” – Ben Saxon, Biological Technician



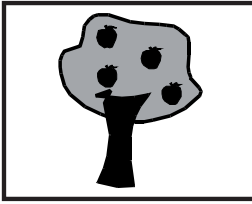
Water Quality: The Water Quality Program conducts 130-miles of monitoring and research along of the Klamath River and several tributaries. This includes data collection on temperature, oxygen levels, sediment, nutrients, toxins, etc. This data informs state and federal processes and policies.

“As an ecologist, I love working for the Karuk Tribe because we use traditional ecological knowledge to manage the entire watershed instead of just for a single species.” – Susan Corum, Water Quality Coordinator

Wildlife: An important function of a comprehensive natural resources department is a Wildlife Division that can survey, monitor, assess, plan, prioritize and facilitate the restoration of habitats that support culturally and biologically significant wildlife species.

“The natural resources are really impossible to separate from one another. Whether you specialize in forest, water, wildlife, fish, environmental policy or Food Security, your subject is interconnected with all the others. In order to improve deer habitat, you’ll need to manage for the grasslands, forest, plants and water upon which they depend. In order to improve land management for these species, you need to fight for policy changes. That is what’s so great about my job the most: it is not only deeply meaningful for me as a tribal woman, it is also so diverse.” -Lisa Hillman, Food Security Project Coordinator





A SLICE OF PLANET EARTH

Subject: Science, Mathematics

Skills: Computing, Listening, Observation

Duration: 30 minutes (or more depending on depth and discussion)

Setting: Classroom

Materials:

- apple
- plastic knife
- napkin
- copies of the Slice of Planet Earth math worksheet for each student

NOTE: Some teachers prefer to make this activity truly “hands-on” by having each student or pair of students cut their own apple according to the teacher’s instructions. If you feel comfortable with students using plastic knives in the classroom, you may want to consider this option. Otherwise, you can demonstrate the apple cutting at the front of the class.

Michigan Curriculum Framework Content Standards and Benchmarks:

- Science (EG)V.1.E1:** Strand V. Using Earth Science Knowledge, Standard 1. Geosphere, Benchmark E1. Describe major features of the earth’s surface. (Key concepts: Types of landforms - mountains, plains, valleys; bodies of water - rivers, oceans, lakes. Real-world contexts: Examples of Michigan surface features, such as hills, valleys, rivers, waterfalls, Great Lakes; pictures of global land features, including mountains, deserts.)
- Mathematics IV.2.1:** Strand IV. Number Sense and Numeration, Standard 2. Representation and Uses of Numbers, Benchmark 1. Represent whole numbers, fractions and decimals using concrete, pictorial and symbolic representations.

Kent County Collaborative Core Curriculum (KC²):

- Science:** 3:5
4:4
- Mathematics:** 3:1, 3:2, 3:3, 3:5, 3:6
4:2, 4:3, 4:7, 4:8, 4:11
5:1, 5:2, 5:3, 5:4, 5:6, 5:11, 5:12

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 this activity, students will be able to:

- Deduce that only a small fraction of the Earth supports all human life.
- Understand fractions when counting and coloring-pieces.
- Describe major features of the Earth’s surface.

BACKGROUND

It is important to realize that land on our planet, or geosphere, makes up only about 1/4 of the Earth’s total surface. Land features include mountains, deserts, polar regions, valleys, plains, prairie, farmland, forests, and wetlands. Each of these features shares a portion of the total amount of land on the planet.

Students tend to think of the land on the planet as being limitless, yet simple calculations demonstrate the fact that the amount of land is limited. The quality of this limited amount of land must be maintained. Human beings have a responsibility to conserve land, use it wisely and protect its quality.

The purpose of this lesson is for students to acquire an understanding of the fragile nature of land as a resource.

PROCEDURE

As you go through this brief demonstration, ask the students the questions that are in quotation marks before revealing the answers noted in italics.

1. Show the apple to the class. “For this exercise, this apple represents our planet.”
2. Slice the apple into quarters.
3. Hold out three quarters. “What does this part of the apple represent?” *They represent the water and oceans of the world.*

4. "What fraction is left?" $\frac{1}{4}$ "This represents all the land on the earth."
5. Slice this section in half. Hold up one of the pieces. "This portion represents the areas where people can't live: the polar areas, deserts, swamps, very high or rocky mountains." Set this piece aside.
6. Hold up the other piece. "What fraction of the whole apple is this?" $\frac{1}{8}$ "This piece represents the land where people can live, but not all of the soil is good for growing food."
7. Slice the $\frac{1}{8}$ piece into four equal sections. Hold three of the sections in one hand and one section in the other. Hold out the single section. "What fraction of the apple is this?" $\frac{1}{32}$
8. Hold out the three sections in your left hand. "These $\frac{3}{32}$ represent the areas too rocky, too wet, too cold, too steep, or with too poor soil to actually grow food. They also contain the cities, suburbs, highways, shopping centers, schools, parks, factories, parking lots and other places people live, work, or use in other ways, but can no longer grow food."
9. Carefully peel the $\frac{1}{32}$ slice of Earth. Hold this peel out so they can see it. "This tiny bit of peeling represents the surface, the very thin layer of the Earth's crust upon which food is grown to feed everyone on Earth. It is less than five feet deep. It takes 100 years for one inch of this topsoil to form."
10. For dramatic effect, you can eat the small piece of apple peel, saying, "If we do not take care of this land, it will be gone."
11. Discuss with the students their observations.
 - Did they realize the small fraction of Earth that supports all human life? What were the other features of the earth's surface?
 - What things cause land erosion? One example is deforestation and loss of natural vegetation. Branches and leaves shelter the soil from the force of rain and wind. Root systems help to hold soil in place. So when trees and vegetation are lost, the soil is blown and washed away.
 - What are some ways we could help to preserve natural open-space and farmland? By choosing not to build anything on land that could be used to grow food. Or, when building is necessary, use wise land use planning and building practices.
12. Assign students to complete the Slice of Planet Earth math worksheet. This can be done in pairs, individually, or for homework. It can also be done while performing the slicing activity or during a review of the slicing.
13. Have students practice retelling the Slice of Planet Earth activity to their partner. Allow them to use apple pieces or a worksheet to explain different parts of the Earth. Assign the students to also retell the story as homework.

ASSESSMENT OPTIONS

1. Have each student write the ending to this statement, "I learned that..." Was the student surprised by the tiny piece of potential farmland at the end of the lesson? If potential farmland is $\frac{1}{32}$ of the earth's surface, what are the other features of the earth's surface? Name and/or draw these features.
2. Assess the mathematical understanding of fractions by evaluating the students' worksheets for completeness and accuracy.

Adaptations/Extensions

1. If the students are unable to cut an apple, allow them to cut a soft round pear with a plastic knife.
2. Assign students to perform this demonstration at home for parents and/or siblings. Have them conduct an interview after the demonstration to get feelings and responses from the audience.

Computer Extensions

1. Math Solutions. Online Newsletter. Burns, Marilyn. Learning from Student Writing: Comparing Fractions With 5th Graders. Fall 1998. 9 May 2002. <http://www.mathsolutions.com/mb/content/newslettersfall_98_nl_2.html> *Abstract: I continued helping the class learn ways to compare fractions. As always, I learned a great deal from the students, especially from their written work. Most revealing to me was the variety of strategies that students developed for comparing fractions. (...) I describe some of what I learned from their writing and offer suggestions for how you can use writing with your students.*
2. Dositay Corporation. Fractional Pizza 9 May 2002. <<http://www.dositay.com/problems/k2/problem37.htm>> Student worksheet.
3. Dositay Corporation. Homepage 9 May 20. <<http://www.dositay.com/>> Short interactive lessons, games, exercises, printable worksheets, open-ended questions, and more.
4. Rand, Richard. Visual Fractions Jan. 2002. 4 April 2002. <<http://www.visualfractions.com/entercircle.html>> Identify Fractions uses circles to demonstrate the meaning of numerator and denominator.
5. Natural Resources Conservation Service. Broad Land Use/Cover by State, May 2001. 9 May 2002. <<http://www.nrcs.usda.gov/technical/land/meta/m5150.html>> United States map shows a pie chart in each state for that state's land usage. Adult information, but interesting pie charts for students to read.
6. Shodor. FRACTION FACTS 2002. 9 May 2002. <http://www.shodor.org/interactivate/lessons/fractionfacts.html> Teacher lesson plan: discussions and activities are designed to introduce students to fractions, including operations with fractions, converting fractions to decimals and percents. The activities provide ample practice opportunities to reinforce the information from the discussions.

TEACHER MEMOS

SOURCE

Adapted with permission from Counting on People: Elementary Population and Environmental Activities, "Earth: The Apple of Our Eye," by Pamela Wasserman and Anne Scullard. Published by Population Connection, 1994. Background information adapted from Project WILD, "How Wet is Our Planet?" Pg. 8.

Worksheet developed by Anne Williamson, curriculum consultant for *United Growth for Kent County*, a grant project of Michigan State University Extension.

ADDITIONAL RESOURCES

Contacts:

- Grand Valley Metro Council
- Land Conservancy of West Michigan
- Michigan Department of Agriculture
- Michigan Farm Bureau
- Michigan Farmland and Community Alliance
- Michigan Geographic Alliance
- Michigan Land Use Institute
- Michigan State University Extension
- Timberland Resource Conservation and Development
- U.S. Department of Agriculture
- United Growth for Kent County

References and Teacher Resources:

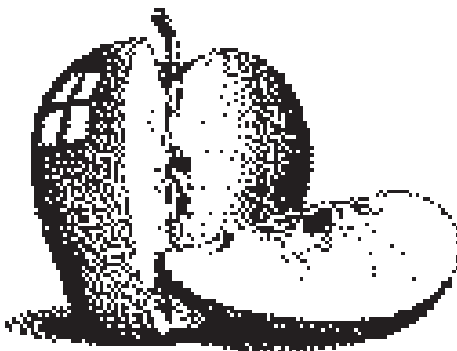
- Ag in the Classroom. Kids, Crops, and Critters. (4-6 grade. Approx. 70 lessons. Contact Bonnie (309) 557 3334. \$20. Illinois: Illinois Farm Bureau.
- Fisher, Ron. *Heartland of a Continent*. National Geographic Society, 1991.
- Fiday, Beverly and David. *Time to go*. Harcourt Brace Jovanovich, 1980.
- MacLachlan, Patricia. *All the Places to Love*. Harper Collins, 1994.

Additional Lessons:

- Project Food, Land, and People: What Will the Land Support? Pg. 337-350.
- Read aloud to the students Fanny's Dream by Caralyn Buehner. (New York: Dial Books for Young Readers)

CONCEPTUAL FRAMEWORK REFERENCE

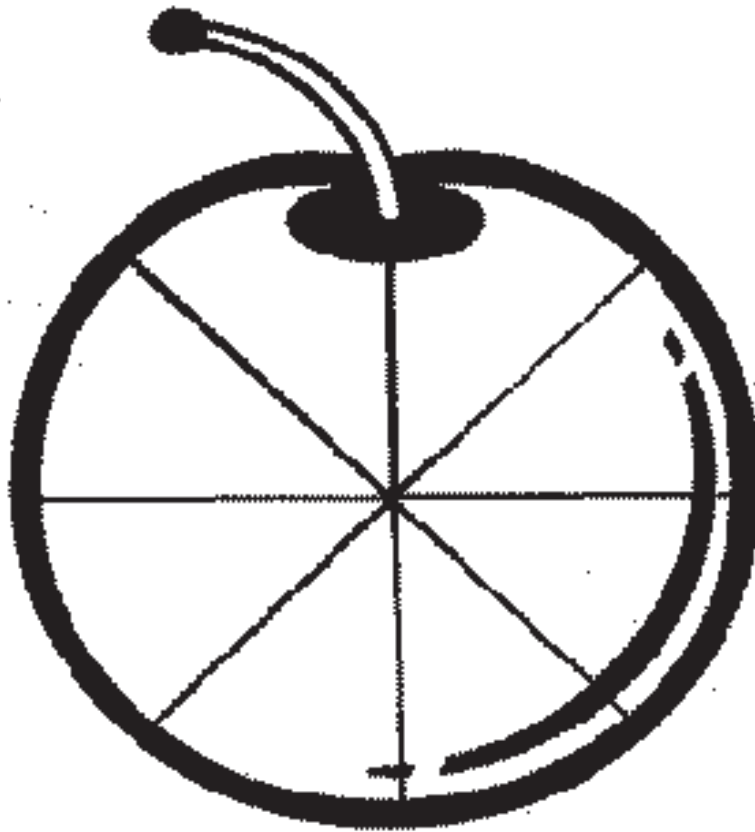
IIA1,IIB1,IID1,IIIB1



A Slice of Planet Earth

Name: _____

Directions: Fill in the missing answers and follow the instructions.



1. The apple, representing the earth, is divided into _____ equal parts.
2. Color $\frac{3}{4}$ of the apple blue. This represents all the water on earth.
3. Continue dividing the whole apple into 32 equal parts.

4. Outline the remaining $\frac{1}{4}$ of the apple green. This represents all the land on earth.
5. Fill in the missing numerator.
 - A. $\frac{\quad}{32}$ of the apple are blue, and represent water covering the earth.
 - B. $\frac{\quad}{32}$ of the apple are outlined in green, representing land on the earth.
6. Color in $\frac{1}{2}$ of the green section with brown. This portion represents land where people can not live such as mountain tops, deserts, and polar caps.
7. Color in $\frac{3}{32}$ of the remaining green section with red. This section represents cities and unfarmable land such as wetlands and rocky areas
8. Fill in the missing numerator.
 - A. $\frac{\quad}{32}$ of the apple are unlivable (brown).
 - B. $\frac{\quad}{32}$ of the apple are unfarmable (red).
 - C. $\frac{\quad}{32}$ of the apple is left for farmland and open space! (white)
9. Actually, only the skin, or crust of the earth, is available for farmland. Circle the outside edge of the remaining $\frac{1}{32}$ green section, and label it "Farmland".

EXTRA CREDIT: On plain paper, draw 32 apple pieces.

- A. Color $\frac{3}{4}$ of the pieces blue. These represent water covering the earth.
- B. Color $\frac{1}{8}$ of the pieces brown. These represent land where people cannot live such as mountain tops, deserts, and polar caps.
- C. Color $\frac{3}{32}$ of the pieces red. These represent cities and unfarmable land such as wetlands and rocky areas.
- D. Outline in green the last white $\frac{1}{32}$ piece, this represents open space and land available for farming on the earth's crust. Label it "Farmland".