

Earth Pockets

Grades K-4

Lesson Summary

Students trace everyday objects back to the natural resources from which they were made and learn how to conserve natural resources and protect animal habitats.

Overview

In this lesson, students will:

- Identify the earth's natural resources.
- Discuss how humans and animals depend on natural resources for survival.
- Make *Earth Pockets* (mobiles) that visually show the connection between everyday products and the natural resources needed to make them.
- Analyze how natural resource extraction affects animal habitats and how negative impacts can be prevented.

Time 🕒

45 minutes to prepare lesson; 90 minutes for lesson

Background

Natural resources come from nature and are used or made into the things we want and need to survive. Clean air and fresh water are resources that supply our most basic needs for survival. Earth's soil, sun and water grow the plants that provide the food we eat and the homes we live in. The heat that keeps our homes warm in the winter is generated mostly from fossil fuels like oil and coal. The metals that we use to manufacture cans and computers come from minerals mined from the earth's crust.

Although natural resources seem to be in great abundance, there are many natural resources that won't be around forever.

Renewable resources are natural resources, such as plants and sunlight that will continue to replenish themselves, usually by reproducing or growing again. Non-renewable resources, however, cannot grow back once they have been used up. Oil and other minerals like bauxite, copper and gold are examples of non-renewable resources.

All facets of nature are interconnected and depend on each other to maintain Earth's life supporting systems. For example, sunlight provides the energy needed for plants to grow, and plants clean the air, prevent erosion, and provide food and habitats for animals.

Very often, while obtaining natural resources from around the world, humans can destroy ecosystems that are animal habitats. For example, aluminum comes from the mineral bauxite, which is found in the tropical rainforests of South America and other parts of the world. In order to extract bauxite from the earth's crust, trees and other plants, which are the natural habitat for animals like the



Vocabulary

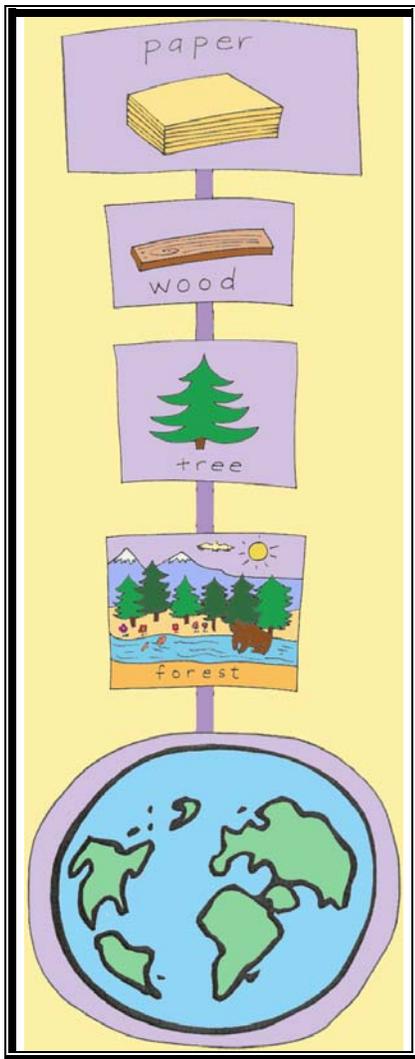
- Natural Resources
- Renewable
- Nonrenewable
- Mined
- Bauxite
- Aluminum
- Petroleum
- Habitat
- Extinct

Materials

- 2 copies of *Earth Pocket Outline* for each student (*See sample at end of lesson*)
- String or yarn (about 2 feet long) for each student
- Cards made from old cereal boxes or index cards, (no less than 9 per student)
- Scissors & stapler
- Crayons and marker

Optional Materials

- Book, *Nature's Cross-Sections* by Richard Orr and *The Great Kapok Tree* by Lynne Cherry
- Atlas or globe



jaguar, spider monkey and toucan, must first be cut down. Without an intact habitat, these animals cannot survive and may go extinct like the dinosaurs.

We can conserve natural resources and protect the habitats of animals around the world by making careful decisions any time we buy, use, or dispose of something. We can lessen the extraction of natural resources from the earth by only buying what we need and choosing items made from renewable resources. This can give us the things we require without using up too much of one kind of natural resource. For instance, we can actually make *tree-free* paper from plants besides trees, such as kenaf, bamboo, hemp, and even old blue jeans! And we can make plastic from corn and potato plants instead of petroleum. We can also reuse what we already have and recycle old products that can be turned into something new.

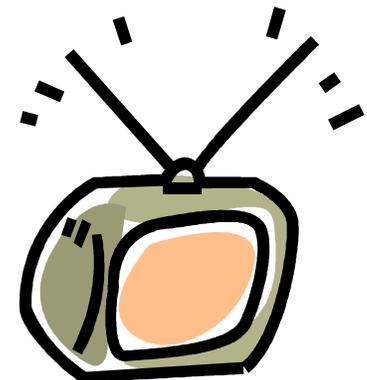
Preparation

- Read background information on front page
- Cut out two copies of *Earth Pocket Outline*
- Staple or glue *Earth Pocket Outlines* together, leaving a four-inch opening to make a pocket.
- Cut a card large enough so it can't fall into the four-inch pocket, and draw a piece of paper on the card. (Note: It is recommended that you make cards out of used products, such as cereal boxes, to model reuse and conserving resources.)
- Cut six cards that are small enough to fit easily into the four-inch pocket, and draw and label one of the following on each card: forest, tree, wood, paper, recycling bin, reduce use of paper, and reuse paper. (See samples at end of lesson.)
- On the forest card, draw what animals might live in the forest.
- Attach all the cards, except for the reduce, reuse and recycling bin card, to a string and assemble the *Earth Pocket* by following the illustration at left.
- Place the cards and attached string inside the pocket, leaving the card with the paper illustration sticking out of the pocket.
- Set the recycling bin card aside to attach later.
- Prepare an *Earth Pocket* that shows how paper can be also be made from a more sustainable natural resource, the kenaf plant. Follow the same the procedure as above, but this time substitute the *tree* card with a *kenaf* card and the *forest* card with a *farm* card. And, eliminate the *wood* card. (See sample on next page.)
- Have students read Fact Sheet: "What are Natural Resources?" (for younger students, introduce relevant concepts from fact sheets)

Pre-Activity Questions

Ask students:

1. What does the word natural resource mean? (*Natural resources come from nature and are used or made into the things we need and want to survive.*)
2. What are some examples of natural resources? (*air, soil, water, plants, minerals, and energy sources such as sunlight, wind and fossil fuels like oil, coal and natural gas*)
3. How do people use natural resources? (*For making things we want like television sets, toys and computers and for getting the food, water and shelter that we need in order to live*)
4. What are some products that people make out of natural resources? List the names of some of the products on the board, as well the natural resource from which they are derived. (*paper-trees, clothing-plants, plastic toys-oil, metal bikes-minerals*)
5. Where in nature do these natural resources come from? (*trees come from forests, plants comes from farms, oil comes from under the ocean or from underground in different regions like the rainforest and the Middle East; minerals come from the earth's crust in places like the rainforest or the desert.*)
6. Are there animals and other living things that live in the same area the natural resources come from? (*Yes, animals like the jaguar, spider monkey and toucan are found in the rainforest where minerals and oil are extracted; fish and whales and dolphins live in the oceans where oil is drilled; bears, bobcats and white tailed deer live in the forests that are cut down to make paper.*)

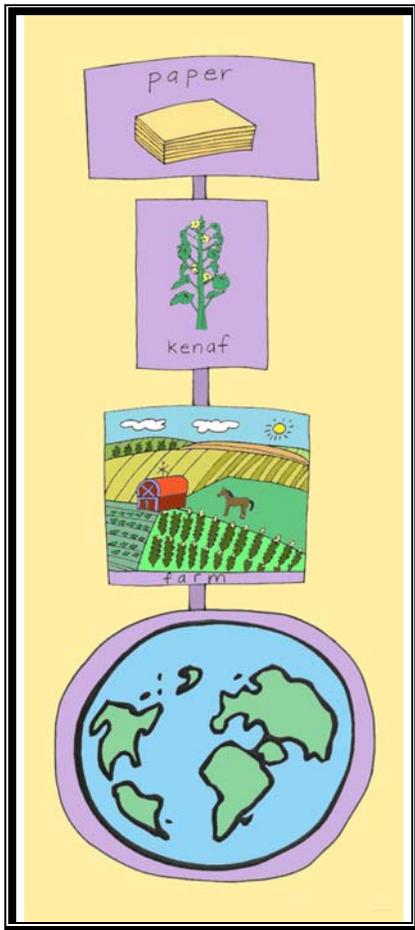


Procedure

Note: The directions for making an *Earth Pocket* may need to be simplified for younger students.

1. Show students the *Earth Pocket* that has already been prepared, making certain that the card on which the paper is drawn is sticking out of the pocket.
2. Ask students what paper is made from. Once they answer *trees*, explain that trees are cut down and the wood of the tree is used to make paper.
3. As you explain that paper is made from wood and wood comes from trees, pull out the string so that the cards with the wood illustration and the tree illustration are showing.
4. Ask where a lot of trees can be found. As the students answer *forests*, pull out the card with the "forest" illustration.
5. Ask students what animals might live in a forest and point out the various animals drawn on the forest card. (*bear, hawk, fish*)
6. Explain that the forest is a *habitat* or home for many animals.
7. Review the *Earth Pocket* chain and the fact that everything humans use, such as paper, comes from the earth and nature.





8. Ask students if they think there is any other natural resource that can be used to make paper.
9. Pull out the kenaf paper *Earth Pocket* and tell them that you have a surprise for them; paper does not have to be made from trees.
10. Explain to the students that instead of cutting down forests and using trees to make paper, some people are making paper from smaller plants grown on farms, like the kenaf plant.
11. As you explain that some paper is made from kenaf, pull out the string so that the cards with the kenaf plant and kenaf farm illustrations are showing.
12. Ask students to work individually to select an item from the list below and then list the steps from the natural resource to the item. The items they should choose from are:
 - Book-paper-wood-tree-temperate forest
 - Paper-kenaf-farm
 - Aluminum can-bauxite-mineral-earth's crust-tropical rainforest
 - Plastic toy-oil-fossil fuel-ocean floor
 - Glass bottle-sand-mineral-prairie

Note: Illustrations for the paper series and tree-free paper series are included at the end of this lesson. They can be copied for younger students. They can color, cut out, and glue each illustration on a card.

13. Tell students that they will be making their own *Earth Pockets*
 - Distribute two copies of the *Earth Pocket Outline*, two feet of string, and at least six cards to each student.
 - Have students color the *Earth Pocket Outline* and cut it out. (Note: Limit this to ten minutes.)
 - Help students place and staple or glue the two outlines together, leaving an opening of about four inches at the top.
 - Have students prepare the illustrations and words for their objects on cards. They should illustrate each step back to the natural resource and habitat from which the object was made. Make certain that students use the larger card for the main object and smaller cards for all the others. Students should connect the parts (in order) to a piece of yarn or string.
 - Ask students to place the sources from which the item was made into the *Earth Pocket*, making certain that the main illustration of the object sticks out.
14. Allow students to share their *Earth Pockets* with a partner or small group.

Note: Students can use a globe or map to locate where the natural resource illustrated in their *Earth Pocket* can be found on this planet. For example, if a student chooses to make an *Earth Pocket* for an aluminum can, ask them to locate a tropical rainforest on the globe. Older students should also determine the latitude and longitude.

Discussion/Questions

1. What did you learn about natural resources today?
2. Why are natural resources important? *(They provide us with the things we want and need to live.)*
3. How do people use natural resources? *(For making things we want; for producing energy; for providing the water food, and shelter that we need to live.)*
4. Can there be shortages of natural resources? *(Yes, if we use a lot there can be shortages, especially for non-renewable natural resources that can't grow back or reproduce)*
5. How do people get the natural resources they use to make the products they want such as paper, metals, plastics and glass? *(They extract or take resources from the earth. For example, trees are cut down to make paper; holes are drilled in the ocean floor to pump out oil to make plastics, and in some rainforests the trees are cut down and the ground dug up in search of minerals to make metals.)*
6. How does taking resources from the earth affect animals? For example, what do you think happens to animals when forests are cut down? *(They lose their homes and some sources of food; it becomes hard for them to survive.)*
7. How can we *conserve* or save natural resources and protect animal habitat? (**Reduce:** *only buy what you need, take care of what you have, and when possible, buy things made from renewable resources such as plastic made from corn plants. Reuse:* *whenever possible, use things more than once and donate unwanted items to charities. Recycle paper, bottles and cans.*)
8. Show students the sample *Earth Pocket* that was prepared for paper and review with them what natural resource is used to make paper.
 - Ask students to figure out ways to use less paper and conserve more trees. *(Reuse it for things like wrapping paper, write on both sides and then recycle it)*
 - Ask students what illustrations you should attach to the *Earth Pocket* to show the solutions for using less paper and saving trees. *(use less paper, write on both sides, recycling bin)*
 - Pull out the use less paper, write on both sides and recycling bin cards and attach them to the paper card at the top of the *Earth Pocket* chain.
 - Discuss with students what they can do with other items such as books, toys, aluminum cans and glass bottles when they no longer want them. *(See Solutions Table at end of lesson.)*
 - Ask students what type of cards they could make to attach to their *Earth Pocket* chains to illustrate their solutions. *(a reuse box, thrift store, friend, art supplies, recycling bin)*
 - Using the solutions discussed, have students make their last card(s) and attach it to their *Earth Pocket* to complete the chain.

Extensions

- Have students make a mobile on how wildlife depends on different things in nature. *(Example: white-tailed deer- plants-river-trees-forest)*
- Ask students to create a collage or poster that shows all the ways humans use plants for the things they want and need to live. *(oxygen, clean air, shade, food, medicine, erosion prevention, wood and paper products)*



Solutions Table

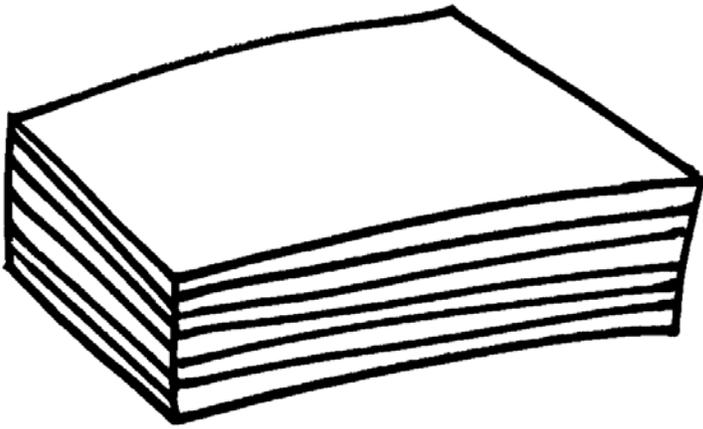
Item	Reduce	Reuse	Recycle
Paper 	Use less	Write on both sides	Recycle at home and at school
Books 	Borrow from library	Donate to charity	Recycle paperback books at home and school Call 415- 282-2344 to find out how to recycle hardback books
		Give to a friend	
Toys 	Buy less	Donate to charity	Toys cannot be recycled, so make sure to reduce and reuse them as much as possible
	Share with others	Give to a friend	
Aluminum Cans 	Use a thermos or mug instead	Use to water plants	Recycle at home and at school
		Fill with dirt and use as a paper weight	
Glass bottles 	Use a thermos or mug instead	Use as a vase for flowers	Recycle at home and at school
		Use as a pencil holder	

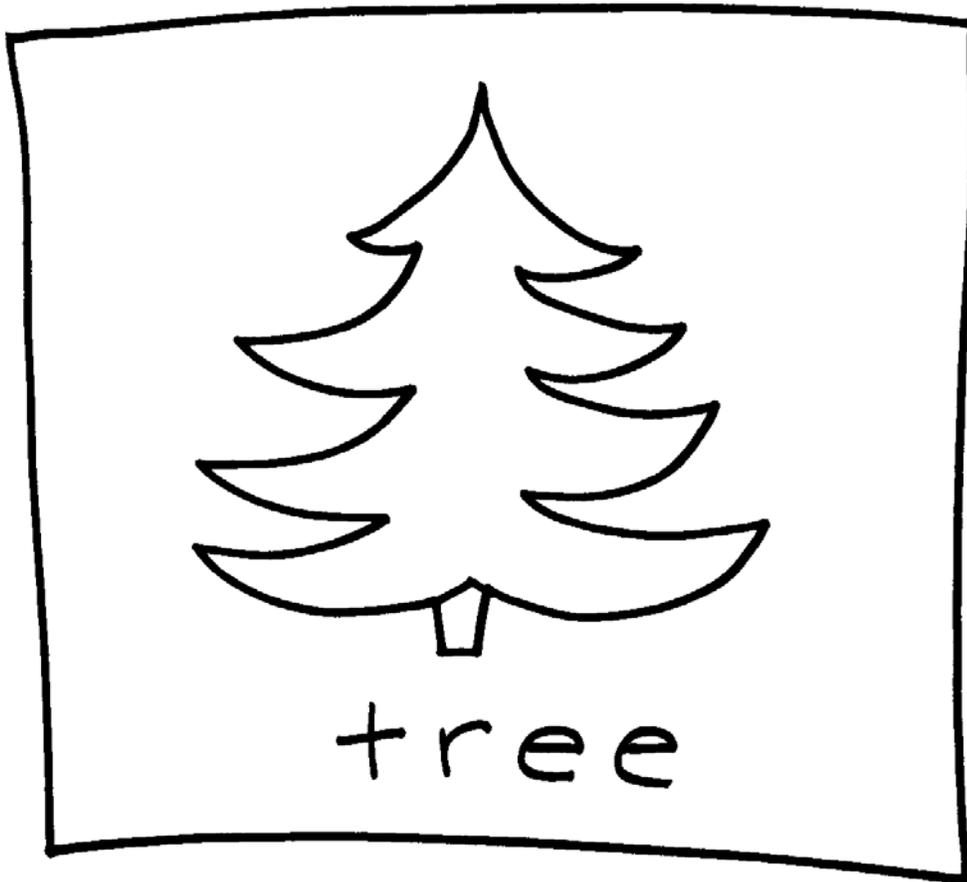
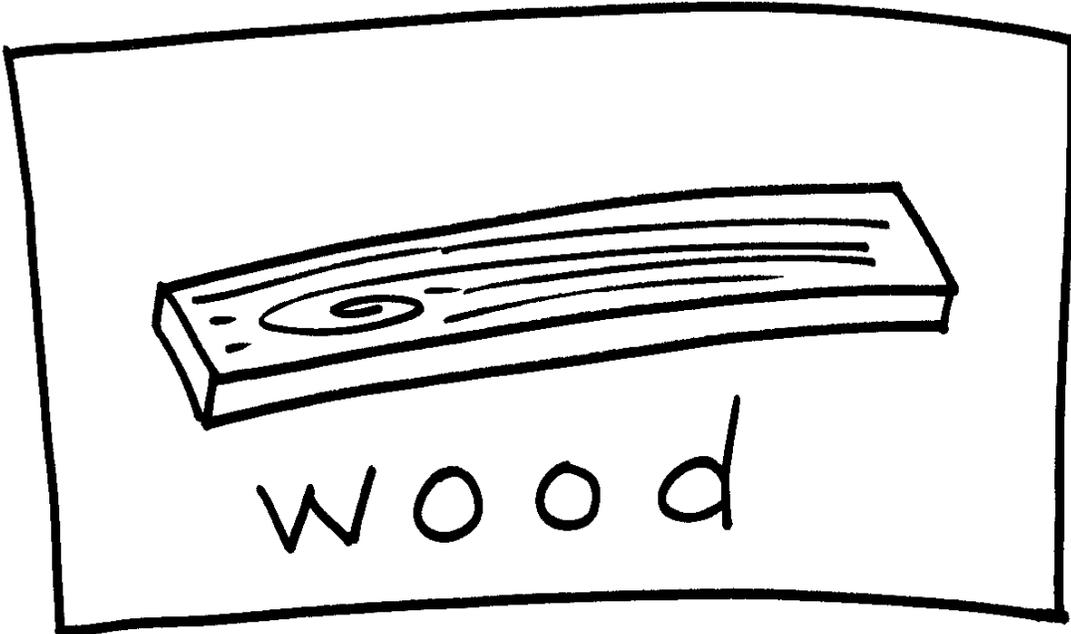
Earth Pocket Outline

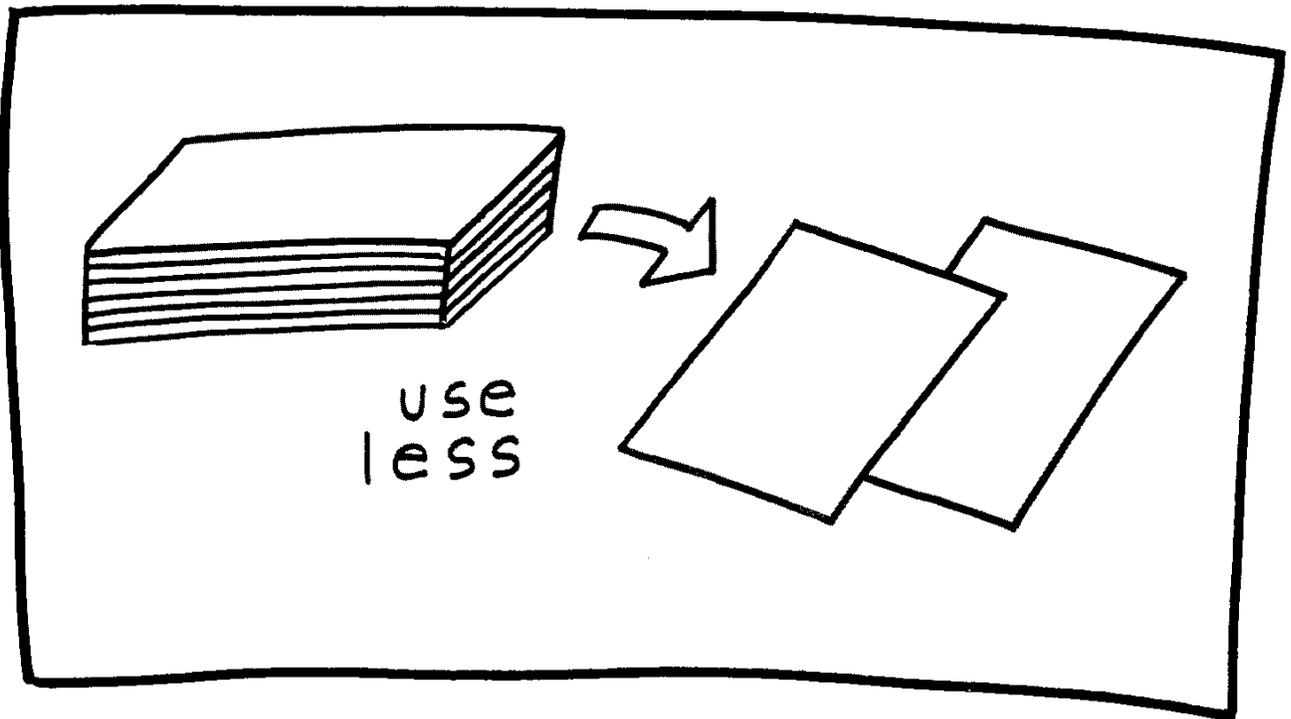


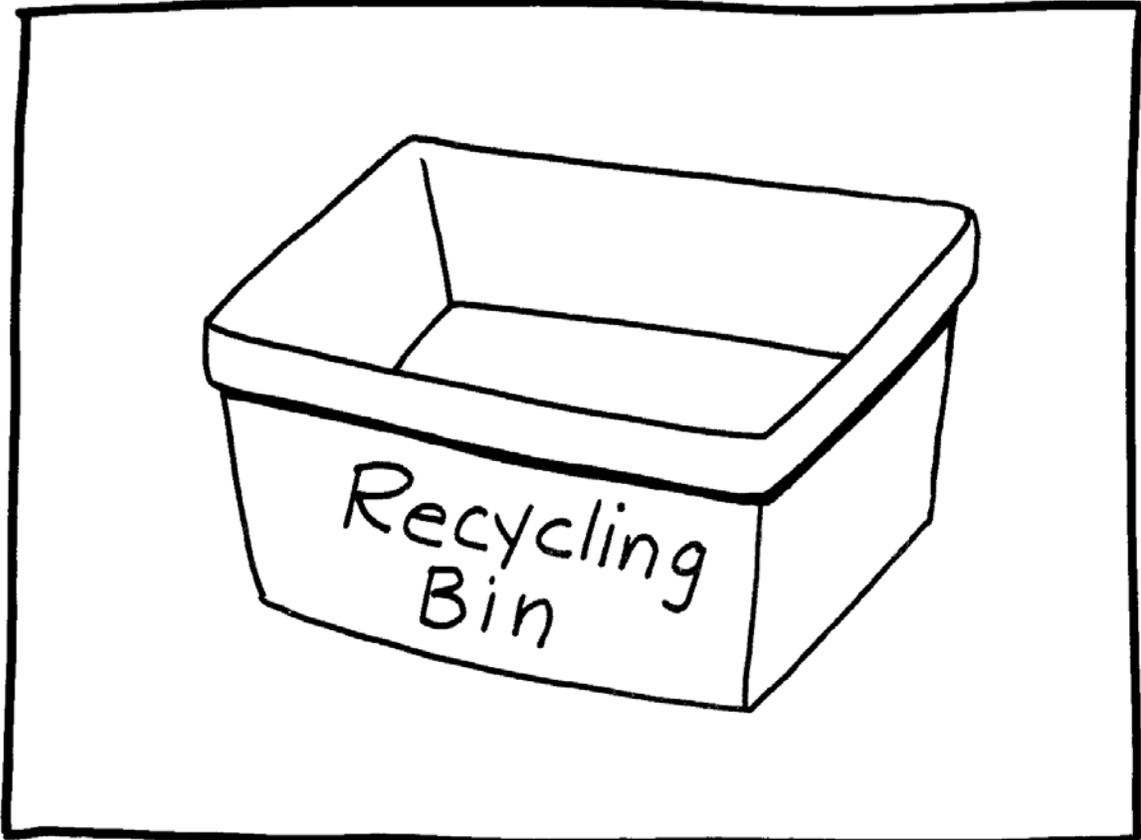
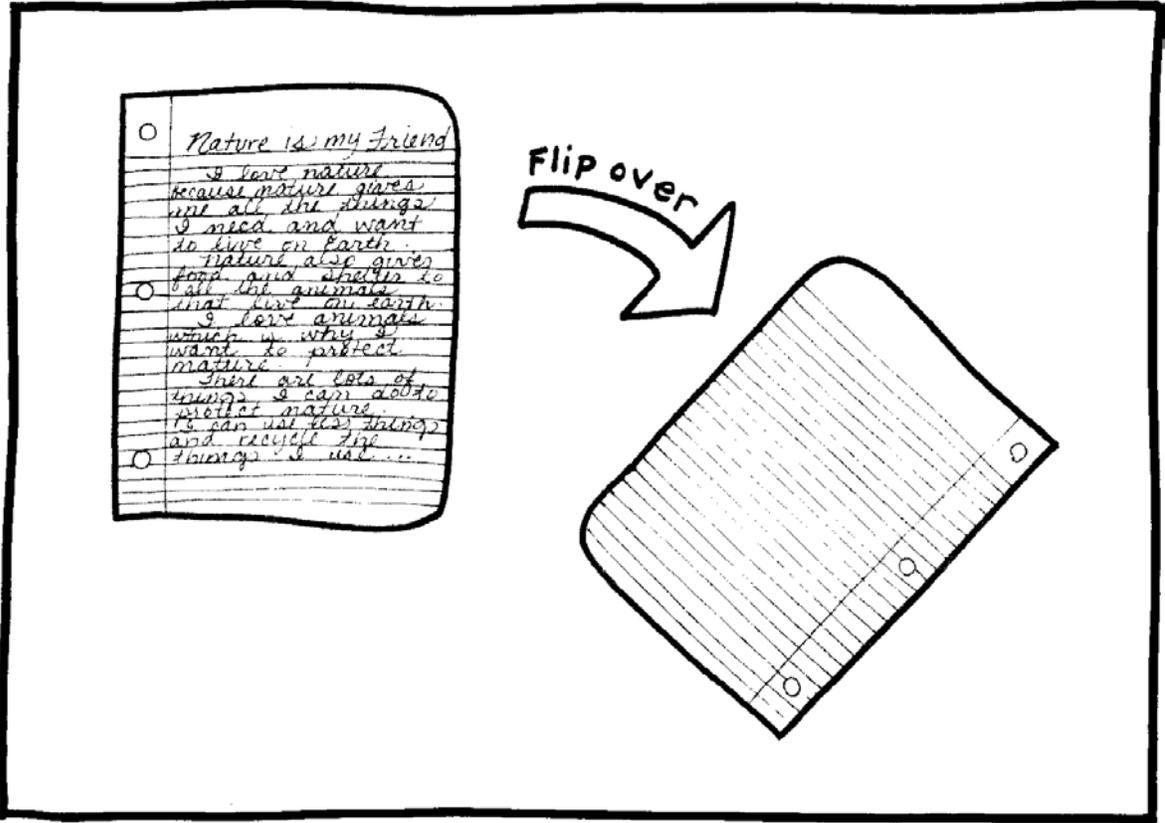


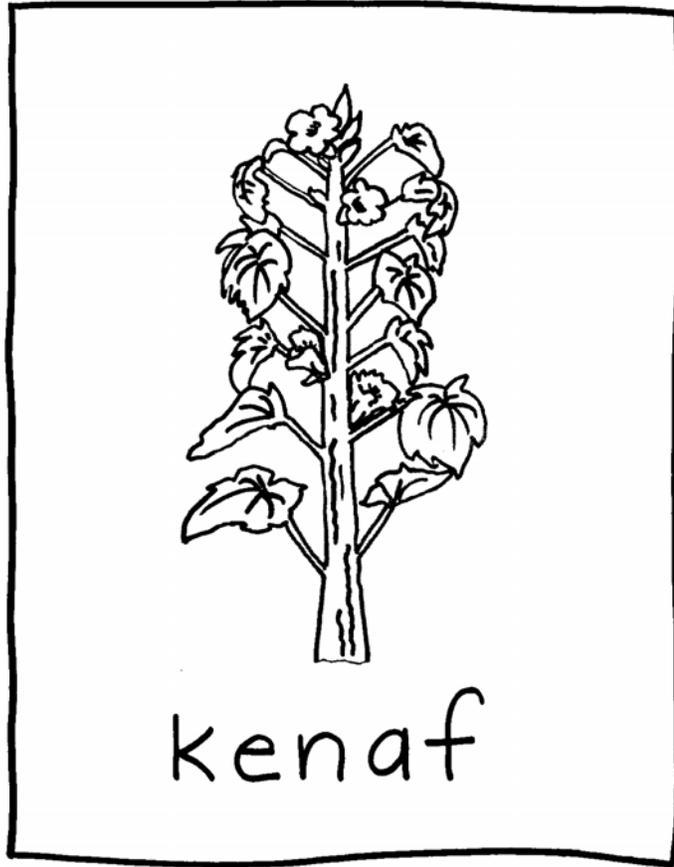
paper



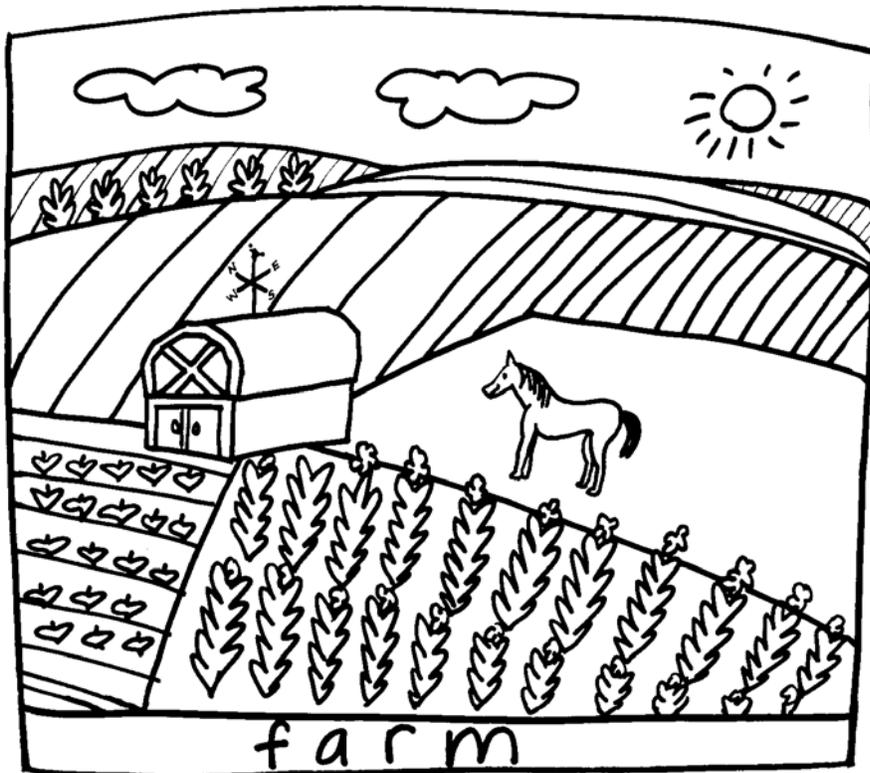








kenaf



farm

Earth Pockets

CA Standards K-5



Kindergarten

Science ♦ 1a ♦ 3c ♦ 4 ♦ 4a ♦ 4b ♦ 4e	Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties. Earth is composed of land, air, and water. As a basis of understanding this concept, students know how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved. Scientific process is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept...students will Describe the properties of common objects. Compare and sort common objects by one physical attribute. Communicate observations orally and through drawings.
Language Arts ♦ W1.3 ♦ LS1.1 ♦ LS1.2	Write by moving from left to right and from top to bottom. Understand and follow one- and two-step oral directions. Share information and ideas, speaking audibly in complete, coherent sentences.

Abbreviations

Language Arts: R=Reading; W=Writing; LC= Language Conventions; LS=Listening/Speaking

Math: N=Number Sense; A=Algebra; MG=Measurement/Geometry; S=Statistics/Data Analysis; MR=Mathematical Reasoning



Grade 1

Science ♦ 2a ♦ 2b ♦ 2c	Plants and animals meet their needs in different ways. As a basis for understanding this concept... Students know both plants and animals need water, animals need food, and plants need light. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.
Language Arts ♦ R1.1 ♦ LS1.1 ♦ LS1.3	Match oral words to printed words. Listen attentively. Give, restate, and follow simple two-step directions.



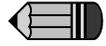
Grade 1 continued

Language Arts ◆ LS1.4	Stay on the topic when speaking.
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Grade 2

History/Social Science ◆ 2.4.3	Students understand basic economic concepts and their individual roles in the economy, and demonstrate basic economic reasoning skills by understanding how limits on resources affect production and consumption (what to produce and what to consume).
Science ◆ 3e	Earth is made of materials that have distinct properties and provide resources for human activities. As the basis for understanding this concept, students know rocks, water, plants, and soil provide many resources, including food, fuel, and building material, that humans use.
Language Arts ◆ R2.7	Interpret information from diagrams, charts, and graphs.
◆ LS1.4	Give and follow three- and four-step oral directions.
◆ LS1.6	Speak clearly and at an appropriate pace for the type of communication (e.g., informal discussion, report to class).

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Grade 3

History/Social Science ◆ 3.5	Students demonstrate basic economic reasoning skills and an understanding of the economy of the local region. Students will...
◆ 3.5.1	Describe the ways in which local producers have used and are using natural resources...to produce goods and services in the past and the present.
◆ 3.5.2	Understand that some goods are made locally, some elsewhere in the United States, and some abroad.
◆ 3.5.3	Understand that individual economic choices involve trade-offs and the evaluation of benefits and costs.



Grade 3 continued

Science ♦ 3 ♦ 3b ♦ 3d	<p>Adaptations in physical structure and behavior may improve an organism's chance for survival. As a basis for understanding this concept...</p> <p>Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.</p> <p>Students know when the environment changes some plants and animals survive and reproduce; others die or move to new locations.</p>
Language Arts ♦ LS1.3 ♦ LS1.5	<p>Respond to questions with appropriate elaboration.</p> <p>Organize ideas chronologically or around major points of information.</p>

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Grade 4

History/Social Science ♦ 4.1.1	<p>Explain and use the coordinate grid system of latitude and longitude to determine the absolute locations of places in California and on Earth.</p>
Science ♦ 3c	<p>Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept, students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.</p>
Language Arts ♦ LS1.1	<p>Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.</p>

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