Tracing
Natural Resources

Grade: 2

Subject Areas:
Life Science, Social Science

Skills: observing, communicating, comparing, ordering, classifying

Duration: 1-2 hours

Connections:
energy, resources, agriculture, manufacturing, wildlife

Vocabulary
natural resources
products
renewable resources
non-renewable resources
fossil fuels
solar energy
consume
replenished
extinct
preserve

Objective:
Students will learn about natural resources and will be able to trace objects to some of the natural resources from which they were made.

Materials
- 'Changer Box'- a large decorated cardboard box with two large openings
- labeled and color coded cards for each of the eight natural resources
- examples of goods made from the eight natural resources
- The Dr. Suess book: The Lorax
- two paper plates per student and Earth Pocket cut-out
- scissors and glue
- yarn or cord (2-3 feet per student)
- colored markers and other art supplies
- hole punch
- index cards
- a collection of natural materials

Standards
Strands: Excellence in Environmental Education Guidelines
Strand 1 —Questioning and Analysis Skills: E) Organizing information: Learners are able to describe data and organize information to search for relationships and patterns concerning the environment and environmental topics.
Strand 2.2 — The Living Environment: C) Systems and connections: Learners understand basic ways in which organisms are related to their environment and to other organisms.
Strand 2.3 — Humans and Their Societies: B) Culture: Learners understand that experiences and places may be interpreted differently by people with different cultural backgrounds, at different times, or with other frames of reference.

California State Educational Standards:
Life Science (LS) 2c: Students know many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment.
LS 2e: Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.
LS 2f: Students know flowers and fruits are associated with reproduction in plants.
Investigation and Experimentation (I and E) 4c: Students will compare and sort common objects according to two or more physical attributes (e.g., color, shape, texture, size, weight)
I and E 4f: Use magnifiers or microscopes to observe and draw descriptions of small objects or small features of objects.

Background

Natural Provider

People, like all animals, need a place to live, air to breath, water to drink, and food to eat. All of these things come from nature and are called **natural resources**. People use natural resources for things they want and need. Things that are made are called **products**. All products from the shoes on your feet to rockets that blast out into space are made from natural resources. Today, people are using resources so quickly that some of them are running out.

Besides people, wildlife need resources too. The availability of resources depends on where they come from. It is easy to think that some resources like water, sunlight and soil will never run out. These types of resources are constantly being replaced and are called **renewable resources**. Others may be rare and difficult to obtain like oil, aluminum and copper. Resources that are not replaced are called **non-renewable resources**.

In this lesson, eight different natural resources will be highlighted. These are: sunlight, air, soil, plants, animals, water, minerals, and fossil fuels. One way to remember these is by using "F.A.S. S.W.A.M.P." (fossil fuels, air, sunlight, soil, water, animals, minerals and plants respectively).

Fossil fuels are a unique category of natural resources because they are here temporarily. They include oil, coal and natural gas. **Fossil fuels** aren't really made from fossils, but are a result of millions of years of accumulated decomposition of ancient plant and animal remains. These energy sources have become central to modern societies and many people are working hard and fast to come up with alternatives.

FOSSIL FUELS: Many things used today come from fossil fuels including plastic. Plastic is light weight, durable and long lasting. One of the problems with plastic is that it takes a long time to break down in the environment. In the oceans, for instance, it may take as long as 5000 years for one plastic bottle to break down. It also takes a lot of energy to make plastic things. Now days it is difficult to find alternatives to plastic. Goods that we buy are either made of plastic or packaged in plastic. Toys, cars, computers, furniture, and

Local Connection

Where does our garbage go?
When somebody takes out the trash in Humboldt county it doesn't stay here. It is trucked north through Anderson and Medford every day and eventually ends up at southern Oregon's Dry Creek Facility located in Jackson, Oregon . That is unless certain local companies intercept it. For instance, Fire and Light is a company that buys 8 –10 tons of recycled glass from the Arcata Community Recycling Center every month. They separate it by color, clean it, and melt it at different temperatures for different colors, some reaching 2400° F. Melted glass is placed into graphite molds producing beautiful handmade recycled glassware.

The next generation of diverted trash for Humboldt county residents might be food waste. Food waste can be separated at various levels. Food still fit for human consumption can be given to food banks and kitchens. Scraps deemed unfit for human consumption can be used as food for animals like pigs or can be composted. Another option is to get a food waste digester. Based on 1990 statistics, almost 19% of Humboldt county's waste stream was food waste.

Since 2006, certain products are deemed universal waste and should never be put into a landfill. These items include batteries, paint, oil, electronic waste (old computers and appliances, CDs, VHS tapes, etc.), and anything with mercury in it, which includes fluorescent light bulbs. To get rid of these products, one needs to research where household hazardous waste can be taken. Monthly mobile services are available in different areas. For more information about where to take universal waste call the HHW hotline at : (707) 441-2005

For people in the southern Humboldt community, trash at the number of different transfer stations is picked up by the Eel River Disposal Company. This company is locally owned and has been servicing the Eel River Valley and nearby Shelter Cove for over 25 years.

sometimes even house plants are all examples of things made from plastic.

AIR: Air is a mixture of gases including nitrogen, oxygen, and water vapor. People and animals depend on oxygen to breathe. Air can mix with water. This happens when water moves rapidly like in a fast moving stream or waterfall. Oxygen in water is what animals, like fish, breathe. In soil, air spaces are important otherwise the roots of plants can be smothered and animals like worms can suffocate. Plants produce oxygen and absorb carbon dioxide which helps keep the air clean. Moving air is called wind.

SUNLIGHT: If it wasn't for the sun, there would be very little wind. As the sun hits different parts of the planet, air reaches different temperatures. Cold air sinks and warm air rises causing the air to move. Sunlight is the energy source for life. Almost every living thing depends on the sun for food, especially plants. Plants make food by absorbing sunlight through their leaves. Animals including people eat plants. People also use sunlight for heat and energy. A clean source of energy that uses sunlight is called **solar energy**. The sun's energy is the engine behind the water cycle too. Water is cycled from the sky to the ground and back up to the sky in this important cycle.

WATER: Water is a very precious resource because without it, life would not be possible. The water within the cells of living organisms holds and transports nutrients among other things. Humans as well as plants and animals are mostly made of water. Most of our planet is covered by the ocean which is full of life. The ocean is not only an important habitat it is also important in maintaining the balance of large systems like the water cycle. People use water for many things including transportation, cleaning and cooling.

PLANTS: Plants need water in order to grow. Almost all of the food we eat comes from plants. Not only do people rely on plants for food, but use plants for medicine, heating, and shelter. Trees are very important plants because they produce wood. Many products are made from wood. Some wood is very strong which is why it can be used to make things like buildings and bridges. Some plants have fibers which can be used to make products like paper, cardboard and cloth.

SOIL: Of course growing plants would not be possible without soil. Soil provides important nutrients and moisture which plants need to survive. Many animals live in or under the soil like gophers, worms, and ground squirrels. Many people don't realize that it has taken hundreds if not thousands of years for many soils to develop. Soil can become compacted and stripped of nutrients. Soils come from parent materials which are usually broken down rock. Rocks are mostly made of minerals. Many minerals are non-renewable because they come from geological processes that occur over millions of years time.

MINERALS: Minerals can be hard or soft and are very important resources for people. They are used to make glass, appliances, computers, and even electronic toys. All metals like gold, silver, copper, lead and aluminum, are made of minerals. Metals are very important because they are durable and last a long time. Objects that require great strength like cars and airplanes are made of a mixture of minerals like steel. Soft minerals like talc and gypsum are used for cosmetics, paints, and fertilizers.

ANIMALS: Animals are resources too. Domestic animals like cows, pigs, sheep and chickens provide us with meat, eggs, dairy products, leather and wool. Fish and other animals that live in water like clams, shrimps and squid, are important food sources too. Fish in some places are the main food source for many people. Domestic animals in many countries are used like machinery; they plow fields and move heavy things like logs and bricks. People also receive pleasure and entertainment from watching and relating to animals like pets.

Slow Consumption

Even though some resources are renewable, people have to be careful how we use them so we won't run out of them. When people **consume** or use resources too fast they become depleted. They cannot be **replenished** or refilled in time and therefore are considered unsustainable. Food and water are often wasted. Trees and soil and be cut down and stripped away so fast that they cannot be replaced. If resources are not allowed time to replenish they will disappear. Oil is a resource that will definitely run out someday. In some places wild lands are disappearing. Many animals are on the brink of extinction because resource extraction is destroying habitat that they need. Once something becomes **extinct** it is gone forever.

People need to find ways to **preserve** or save resources so that they will be available for future generations to use. Even resources like water and air shouldn't be taken for granted. Water and air can easily become polluted when people aren't careful. By making connections of where resources come from, students can begin to learn about the environment in which they live and play.

Activity 1: From Resources to Products

Preparation

This lesson requires several items be made ahead of time. A cleverly designed box or "Changer Box" is encourage to be used in a dramatic way to have the students understand where things come from. Clearly marked labels with one or more pictures of the resource need to made ahead of time. Each resource card will be inserted into the box and something made of it, or a product, will come out the other side. For instance, a card labeled sunlight with a picture of the sun, might be put into the "Changer Box" and a living leaf or an orange (examples of products) will come out the other side. The "Changer Box" will work best if it is set on two tables. On the product side have all of the products ready in the order you will be removing them. Keep these hidden from the children.
Here is a list of recommended products and their required resources.

Fossil Fuels/plastic toy or plastic water bottle
Air/balloon or a bird
Sunlight/orange or living plant
S: Soil/any type of food
Water/juice or a cotton shirt
Animals/glass of milk or slab of ham
M: Minerals/a stapler or anything made of metal
P: Plants/something made of wood

Materials

- **a "Changer Box". A "Changer Box" is a large decorated cardboard box designed with two large openings. One opening is for incoming resources and the other opening is for out-going products. It can be thought of as an imaginary factory.**
- **labeled and color coded cards for each of the eight natural resources**
- **examples of goods made from each of the eight natural resources**
- **The Dr. Suess book: The Lorax**

Procedure

1. Gather the students around the "Changer Box" and explain to them that they will be learning about where things come from. Hold up something that is made of multiple parts like a camera with a leather strap. Ask the students what it is made of. (metal, plastic, leather) Explain to them that everything comes from something else: metal comes from rocks, plastic comes from oil and leather comes from cows. Next hold up something more common like an apple. Ask them what it is made of. This may be a little more difficult for the students to predict. (sunlight, water, soil). Next, tell them that you have brought in a very important machine called a "Changer Box". This "magical" machine will take a natural resource and turn it into something else. Explain to them that everything people use comes from nature. These things are called natural resources. Write the eight natural resources on the board and have the labeled cards ready to display. Say each one slowly as you point to the word and hold up the card. Have the students say them after you.

2. One at a time, place a card into the box and pull out the product. Each time you pull out a product, look surprised. The more drama and humor you can add to this activity the better. You may want to have the students predict what "product" will come out the other side. After you have put all eight resources through the box, pretend like you are putting the box in reverse. Ask for a volunteer to be put into the box—you may want to choose a small child so that they can get under the box more easily. Ask the rest of the class, what a person is made of. Once the volunteer enters the box, pull out the cards or resources that they are made of (water, sunlight, air, soil, plants, animals, and minerals). See if they can figure out which natural resource is missing. This is a good time to introduce the fact that fossil fuels are different from all of the rest. They are non-renewable and will not be replaced.

3. Next, explain to the students that you want to read them a book about a natural resource that is found where the Grickle-grass grows. Gather the students around and read them the Lorax by Dr. Suess. Once the story is finished, ask them what they learned from the story. Follow up by asking if they think Truffula Trees are real.

Activity 2: Making an Earth Pocket

Preparation

Ahead of time, have selected graphics representing all of the 8 natural resources. Punch holes in the paper plates if you want the plates woven together using yarn. There are many options for decorating the Earth Pockets. To save resources, you may want to put the selected graphics on the backs of cereal boxes or other sources of re-used cardstock. You may also want to cut the yarn to desired lengths and hold punch the bottom of the cards to save time. Make an example of the final product.

Materials

- **two paper plates per student and Earth Pocket cut-out**
- **scissors and glue**
- **yarn or cord (2-3 feet per student)**
- **colored markers and other art supplies**
- **hole punch**
- **pre-made index cards**
- **a collection of natural materials (optional)**

Procedure

1. This activity can follow Activity 1 or it can be used by itself. If used by itself, take some time to introduce what natural resources are and where they come from. Have an Earth Pocket ready so that you can slowly pull out each of the cards one at a time in the correct order.

2. Tell the students that they will be making their own Earth Pockets. Have the necessary materials sorted out and placed in central locations so that students can work in groups of 4-6. Show them a completed Earth Pocket. Model the different steps that need to be done.

3. Have the students begin by cutting out two pictures of the earth template. Next, the students should color and decorate the earth cut-outs. After they have colored the two earth pictures, have them paste them onto two paper plates. Now they should be ready to assemble the two paper plates together. This can be done by weaving them together using yarn, or stapling them together. Be sure to have them leave the top open to make a pocket large enough to fit the biggest index card.

4. To finish putting together their Earth Pockets, have the students pick the correct cards for their product. For instance, a paperclip is made of metal and metals come from minerals. Therefore, they need to pick three cards: paperclip, metal, and mineral. These three cards need to be strung together using yard or cord in the correct order. Once they have done this, they need to put their string of cards into their pocket. They can selected another product, or help clean up.

- *Where do all of the things that people use and make come from? (nature or the earth)*
- *What are these things called? (natural resources)*
- *Who can give me an example of a natural resource?*
- *Show the students your example of an Earth Pocket (pencil, wood, plant).*
- *Pull out the card showing a pencil being careful not to pull out the next card.*
- *Ask: What is the yellow part of pencil made from? (wood)*
- *Ask: Where does wood come from? (trees)*
- *Ask: What group of natural resources do trees belong? (plants)*
- *Pull out the last card showing the word plants.*

Extensions

- Learn about ways people can conserve resources and have the students make a flip book. A pre-made one that only needs to be colored can be found at:http://www.epa.gov
- Have the students go online and visit websites that teach them about the environment.
- Invite a local farmer into the classroom to talk about how he or she grows food.
- Start plants from seeds and watch them grow.
- Visit the petting zoo at the Sequoia Park Zoo.
- Graph various uses of natural resources like the number and type of plastic items people use.
- Make food using a recipe. Have the students recognize where each ingredient comes from.

References

Discovering how to take care of our natural resources, Kids and Conservation, http://www.clarkswcd.org/Kids/KidsHome.htm, 2010

Electronic Universal Waste, Humboldt County Waste Zero, http://www.recologyhumboldtcounty.com/universal-Waste.htm, 2011

Humboldt Waste Management Authority, http://hwma.net/index.php, 2011

Jones, Melissa, An Untapped Resource: Food Waste, http://www.humboldt.edu/ccrp/sites/ccrp/files/publications/Food%20Waste.pdf, Feb. 2011

People Use Natural Resources, Lesson 2, K-3 module, http://www.calrecycle.ca.gov/Education/curriculum/ctl/k3module/unit1/lesson2.pdf, 2010

Planet Protectors Club for Kids, http://www.epa.gov/epawaste/education/pdfs/jellyjar.pdf, 2010

Rossa, Jeannine, Transforming Trash: Where Does All That Glass Go?http://www.recologyashlandsanitaryservice.com/pdf/aug9-jefferson_monthly_aug_feature.pdf, Aug. 2007

What are Natural Resources? Student Fact Sheet B-1, http://www.sfenvironmentkids.org/resources/B-1_Natural-Resources_factsheet0208.pdf, 2010

FOSS Connection

Grades 1-2: (none applicableP

Grades 3-4: Earth Science

Earth Materials