

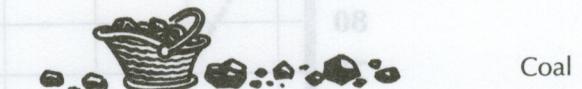
TRAVEL THROUGH TIME

Any time there is a change in technology, it affects the type and amount of natural resources people use. For example, in the past almost everyone burned wood to keep warm in winter. Now people use heating oil, natural gas, or electricity to keep their houses warm. When people switched from using animals for transportation to using machines, there was a new need for oil and fuel. As time goes on, people will develop new machines and tools that will affect our use of resources.

Look at the pictures below. Draw a line from each machine or tool to all the natural resources needed for its operation or manufacture. Note that some machines and tools use more than one natural resource.

Tools and Machines

Resources Used



IMAGINE YOUR FUTURE

Imagine you have a time machine that can take you one hundred years into the future. Write a short story about one new invention you discover in the future and how it may change people's lives. How would this invention affect the use of natural resources? How might it affect the way people use water, soil, trees, or wildlife?

Goal
Students compare past and present technology with resource use, and write a speculative story about the effect of technology on future resource use.

- Related Activities**
- Have students find and collect pictures of different means of transportation through history. Use these pictures to make a timeline which shows when they were first used and when they became less popular. Underneath the timeline, write the resources these machines used in their manufacture or operation. Discuss whether new technology will let past means of transportation be used again today.
 - Make a list of all the solar powered machines and instruments that students have encountered in their daily lives (e.g., calculator, outdoor light, water heater). What are some other likely machines that will be converted to solar power over the next few years? How will this affect our use of natural resources? Is sunlight a natural resource?
 - Have students speculate what changes might occur should mankind discover an inexpensive way to turn ocean water into fresh water. What areas of the world would benefit from more farm land because of this? What could be the impact on ocean ecosystems?



Research

Plants, water, and soil work together to make a healthy environment. Plants need soil to grow and plants also hold soil in place. Plants need water to grow and plants also help hold water in the soil.



Discover how plants, soil, and water work together in your own backyard. Find a 3 foot by 3 foot area with grass and plants that won't be disturbed for twelve days. Carefully remove plants from half the area, leaving only bare soil. Now cover half of the bare area, using the removed plants and grass to make mulch. Now you have three areas: (1) Area with plants, (2) Area with bare soil, and (3) Area with mulch. Water the entire area with a hose or watering can every three days for twelve days. At the end of each three-day period, record your observations about each area in the diary below. Note whether water was absorbed or ran off, whether soil stayed in place or washed away, and wildlife you saw in each area. If you don't have access to a backyard area, you can do this activity in a school yard, or even in three boxes or flat pans.

	Area With Plants	Area with Bare Soil	Area with Mulch
Days 1-3			
Days 4-6			
Days 7-9			
Days 10-12			

At the end of the twelve-day observation period, answer the following questions:

1. Which area held the water the best?
2. Which area lost the most soil when it was watered?
3. Which area had the most wildlife activity (including insects)?
4. What other things did you notice about each area?

Discuss your conclusions about soil, water, mulch and ground cover.

Goal

Students observe and record relationships between soil, water, living ground cover, and mulch.

Related Activities

1. Have students find out about the different types of materials that can be used as mulches. Are there non-organic materials that can be used as well? What are the advantages of some mulches over other types?
2. Survey students about their yard maintenance practices at home. When they mow their lawns, do they leave their grass clippings on the yard for a summer mulch? Do they leave their leaves on the yard for a fall mulch?
3. Select a plant for planting near your home or school. Find out all you can about the water needs of that plant. Does it need regular watering in addition to rainfall? Is it a plant that naturally grows in that area? Plant two of these types of plants. Plant one with mulch and one without mulch. Observe the difference the mulch makes in the amount of water each plant needs through the year.

POLLUTION SOLUTION



Rain that is not absorbed into the soil is called **run-off**. In the past, run-off from farms and neighborhoods carried soil and fertilizer into rivers and streams. Too much soil in water reduces sunlight and harms water life. Fertilizers cause too much algae to grow in water and also add to pollution.



Today, farmers use **conservation buffers** to protect water supplies from soil and fertilizer in run-off. Conservation buffers are made by planting native plants along banks of rivers and streams. The roots of these plants reduce erosion and filter out soil particles and fertilizer from run-off before they reach and pollute the stream.

Look at the picture of the conservation buffer above and complete these sentences.

1. Plants along the stream give _____ a place to live and food to eat.
2. The roots of plants hold _____ in place so the stream bank does not erode.
3. Fertilizer run-off is used by the _____ to help them grow.
4. Plants shade the stream and make the water better for _____ to live there.
5. Plants trap soil and fertilizer in run-off to reduce _____ pollution.

Goal

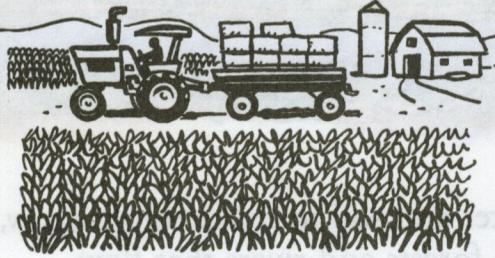
Students complete sentences describing how a conservation buffer enhances natural resources near an agricultural or residential area.

Related Activities

- Record pollution problems in your neighborhood or community with cameras, video cameras or journals. Discuss what steps could be taken to correct these problems.
- Native plants provide a source of blooms and flowers for bees and other natural pollinators. They also require less water to grow and maintain. Have students locate areas in their town or neighborhood where native plants would be a welcome addition for their beauty and for their ability to attract bees to help other plants grow. What are the economic and environmental advantages to using native plants along roadsides?
- Have students research a specific local pollution problem in their area. For example, how is waste and trash handled and disposed of in their community? Are there recycling programs? How do they work? How are dangerous household chemicals disposed of in your community? Invite a local official to talk with students about how one of these problems is handled in your community.

TEAM SPIRIT

Land can be used for different purposes. It can be left alone as a home for wildlife and native plants. It can be cultivated to grow food for us to eat. It can also be used to build homes and businesses.



These three people want to use an area of land in different ways. One wants to keep it as a nature preserve for wildlife, another wants to use it as farmland to grow food, and the third wants to develop the land as a shopping center. To help decide how to use land, people look at both the benefits and the drawbacks in their decision.

Read the statements below. Each sentence describes a benefit or drawback of a particular land use.

If the sentence describes using the land as a nature preserve for wildlife, write "1."

If the sentence describes using the land as farmland, write "2."

If the sentence describes using the land for a shopping center, write "3."

- | | |
|--|---|
| <input type="checkbox"/> Produces food for people to eat. | <input type="checkbox"/> Takes many resources to build. |
| <input type="checkbox"/> Makes new jobs for many people. | <input type="checkbox"/> Only a few people use the land. |
| <input type="checkbox"/> Gives wild animals a place to live. | <input type="checkbox"/> Lets people raise animals. |
| <input type="checkbox"/> Uses water and soil. | <input type="checkbox"/> Lets people visit and meet with each other inside. |
| <input type="checkbox"/> Covers the ground so water runs off. | <input type="checkbox"/> Lets people make a living from using the land. |
| <input type="checkbox"/> Produces little money or jobs. | <input type="checkbox"/> Provides a place for people to buy things they need. |
| <input type="checkbox"/> Lets animals raise families safely. | |
| <input type="checkbox"/> No people can live on the land. | |
| <input type="checkbox"/> Provides an area for recreation and nature study. | |

What are other benefits and drawbacks of using the land as a nature area? As farmland? As a shopping mall?

Now that you have considered benefits and drawbacks of using land in different ways, think how **you** would use this land. Would you choose only one use, or a mixture of uses? Why would you use the land this way?

People with different outlooks can work **together** as a team to decide how to best use land. That way, everyone wins! How can people work together to use the land in more than just one way?

Goal

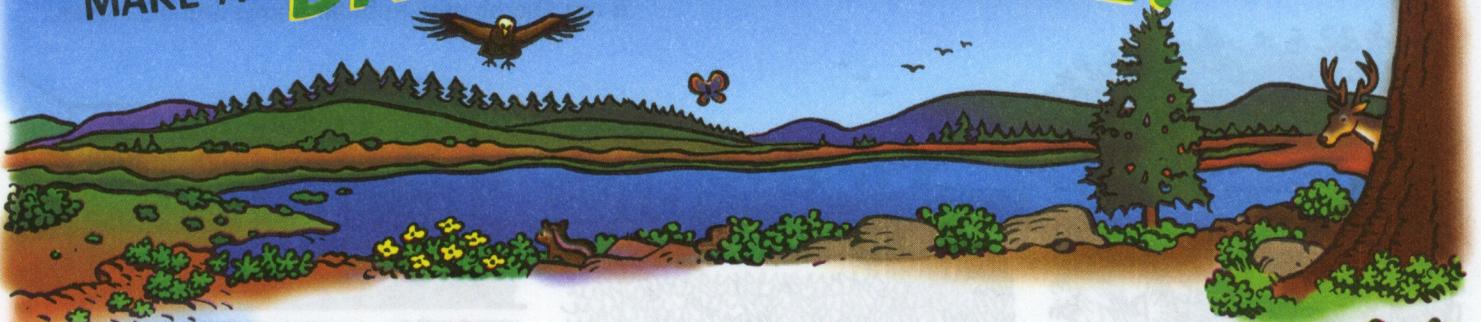
Students identify economic and environmental benefits and drawbacks of using land in different ways.

Related Activities

- If several students participate in this activity, have them divide into groups desiring different land uses. Encourage the different groups to present their views to each other and see if they can find a solution that will satisfy them all. Is there a "win-win" solution? How can the different groups cooperate?
- Visit an area that is used for commercial use but has also integrated plans for wildlife habitat. Examples of this might be a business park where green space has been set aside between the buildings or a shopping area where a portion of land was allowed to remain undisturbed. How can other commercial areas in the community be enhanced for wildlife habitat (eg., planting shrubs, trees, or flowers that provide a food source or allowing native grass to grow to provide shelter).
- Have students talk to a member of a land planning board in their community to learn how decisions are made regarding land use.
- Farmers can benefit when areas that adjoin farmland are used for wildlife habitat. Discuss how a farmer might benefit from wildlife habitat on a farm. For example, leaving a row of trees and shrubs between fields will provide habitat for birds, bees and other animals. How would this benefit farmers? (Discuss pest control and pollination.)

WE CAN
MAKE A

BRIGHTER FUTURE!



We have water and soil to make things grow,
Wildlife and forests and rivers that flow.

We have land to raise food and to give us a home,
Land to enjoy and for animals to roam.

If all our resources we carefully use,
A better tomorrow we wisely choose.

Working together, we'll do things right,
And we'll make sure Earth's future stays bright!



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