

# Dr. Seuss and Resource Use

## Objective

To learn about resources and the potential negative impacts humans can have on the environment through overconsumption.

## Activity Description

Students will listen to the teacher read *The Lorax* by Dr. Seuss. The teacher will then show the class products that exemplify reduced resource consumption.

## Materials Needed

- *The Lorax* by Dr. Seuss

## Key Vocabulary Words

- Natural resources
- Pollution
- Ecosystem
- Consumption

## Duration

2 hours

## Skills Used

- Reading
- Problem solving



science



language arts

## Activity

### Day 1: Listening Exercise

**Step 1:** Introduce and discuss the concept of natural resources and product consumption with students (refer to the Teacher Fact Sheet titled *Natural Resources*). Review vocabulary words above. Note how humans continue to consume more and more products, which takes a toll on the environment.

Explain that ecosystems are comprised of many different interrelated components, such as different plant and animal species. Add that when one part of an ecosystem is disturbed, it impacts the entire ecosystem.

**Step 2:** Take students to a quiet area outside where they can sit comfortably and listen without distractions. Have students sit in a circle. Once settled, ask students to close their

eyes and take three long deep breaths to help them relax.

**Step 3:** Once students are calm and attentive, read *The Lorax* out loud. In this story, a character called the "Once-ler" cuts down "Truffula" trees for their valuable silk tufts and uses them to make "thneeds." Due to increasing thneeds sales, the Once-ler builds a factory and invents an axe that can cut down four trees at once. The Lorax, a wise creature of the forest, recognizes the potential harm this could have on the Truffula tree forest ecosystem. He speaks up to defend the trees, animals, air, and water that the Once-ler is destroying in pursuit of more money and to satisfy those who want thneeds. Eventually all the Truffula trees are depleted, and the Once-ler can no longer produce thneeds. The once beautiful site is left contaminated with polluted air and water.



## Journal Activity

Remind students that the Lorax spoke for the trees, "for the trees have no tongues." Ask students to choose one thing in the environment that is in jeopardy and cannot speak for itself and defend it. Why is it in jeopardy?

**Step 4:** Discuss the story with the students. Begin by asking them why the Once-ler is called the "Once-ler." Evaluate why the Once-ler had to use all the Truffula trees and ask the students to speculate why he would not listen to the Lorax. Ask the students if they can suggest a way for the Once-ler to make thneeds without destroying the ecosystem in which the Lorax lived.

**Step 5:** Have students suggest "thneeds" that they often use (e.g., clothes, food, books). Instruct students to go home that night and think about how they can consume less resources while still using their thneeds. One example is buying used clothing instead of new clothing. Instruct students to bring in their thneed for a "show and tell" activity the following day.

### Day 2: "Show and Tell"

**Step 1:** Have students present their thneed and explain their solution for consuming less resources while using their thneed. If the student cannot think of a solution, ask the class to contribute its ideas.



## Assessment

1. Ask the students why the Once-ler cut down the Truffula trees.
2. Ask the students why the Brown Bar-ba-loots have to leave the forest after the Once-ler starts his thneed production. Could something like this happen in real life? How?
3. Have students list three ways the Thneed factory caused problems for the Truffula Tree forest and its residents.
4. Have students explain what the Lorax's message "Unless" means (answers should include the need for future generations to protect and care for the Earth).



## Enrichment

1. Break students into groups of approximately five students. Have students rewrite *The Lorax* so that the Truffula tree forest and its inhabitants are saved. Students can use this to develop a script and act out their own story in front of the class.
2. Instruct students to create a collage of their needs and wants, labeling them "thneeds" and "thwants," by cutting pictures out of magazines. Once the collages are complete, ask the students to tell the class about opportunities to use less resources with the thneeds and thwants.

# Natural Resources

## What Are Natural Resources?

Natural resources are useful materials from the Earth, such as coal, oil, natural gas, and trees. People use natural resources as **raw materials** to manufacture or create a range of modern conveniences. Water and food provide humans with sustenance and energy, for example, and fossil fuels generate heat as well as energy for transportation and industrial production. Many of the same natural resources used by people are important to plants and wildlife for survival as well.



## Virgin Versus Recovered Resources

Resources used for the first time are considered **virgin resources**, and their extraction, processing, and use requires a great deal of energy and can create pollution. **Resource**

**recovery** is a practice that conserves natural resources by extracting used materials (e.g., paper, glass, and metals) and energy from the waste stream and reprocessing them for reuse. For example, a company can create plastic from oil, a virgin natural resource, or it can use recovered plastic from recycling programs. If a company uses recovered plastic, it is actually saving materials that would otherwise become waste, helping to prevent the depletion of natural resources, conserving energy, and preventing pollution that would have been created in the extraction and processing of oil from the ground.

In addition to the benefits already discussed, using recovered resources reduces threats to **biodiversity**. Natural resource extraction, along with other human activities, increases the rate at which species of plants and animals are now

## Key Points

- Natural resources are vital to all forms of wildlife and the ecosystems in which they live.
- Humans use natural resources for such modern conveniences as electricity, transportation, and industrial production, as well as basic survival.
- Rapid population growth, a higher standard of living, and technology all contribute to increased use of natural resources.
- Extracting, processing, and using natural resources can cause environmental problems, such as the disruption or destruction of ecosystems; a decrease in biodiversity; and land, water, and air pollution.
- Using renewable natural resources impacts the environment less than using nonrenewable resources because their supply can be regenerated.
- Using recovered resources prevents natural resources from being wasted.
- Using recovered resources rather than virgin resources reduces the emission of greenhouse gases in the atmosphere.
- Resource recovery and conservation, as well as buying recycled products, are emerging trends that reduce consumption of natural resources.

vanishing. Diminishing the Earth's biodiversity has a substantial human cost because wild species and natural ecosystems are important resources. For example, some economists estimate that the lost pharmaceutical value from plant species extinctions in the United States alone is almost \$12 billion. Reducing the land

## Biodiversity

Biodiversity refers to the variety of organisms that live on Earth. Supporting so many different organisms requires the conservation of the natural resources they need to survive. Using natural resources can not only deplete the Earth of the resources themselves, but by destroying critical **habitats**, it can also drive some species to extinction, ultimately reducing biodiversity.



disturbance and pollution associated with virgin materials extraction by using recovered materials, therefore, helps stop the degradation of the Earth's ecosystems.

## Renewable Versus Nonrenewable Resources

Some natural resources are nonrenewable and some are renewable. **Nonrenewable resources** are those that become depleted more quickly than they naturally regenerate. One example of a nonrenewable resource is mineral ore. Once mined and used completely, it is gone forever for all practical purposes, because it will take millions of years to regenerate.

**Renewable resources** can be replenished at approximately the same rate at which they are used (for example, sun and wind, which can be used to provide energy).

## Products Made From Natural Resources

People use an abundance of resources to survive in a continually developing world. Globally, however, some people live simpler lifestyles than others and therefore use fewer resources. The following table lists some natural resources and the products and services people produce from them.

Natural Resource	Product/Service
Trees	Paper, furniture, fuel
Cotton plant	Clothing
Oil/Petroleum	Plastic, fuel
Gas	Fuel
Coal	Fuel
Iron ore	Steel products (cars, bridges)
Bauxite ore	Aluminum products (cans, car parts)
Gold	Jewelry, dental material
Copper	Wire, coins, electrical equipment
Manganese	Steel, cast iron
Cobalt	Steel, jet engine parts, cutting tools
Platinum	Air pollution control and telecommunications equipment, jewelry
Chromium	Stainless steel, green glass, gems (rubies and emeralds), leather treatment
Diamonds	Jewelry, mechanical equipment

## Renewable or Nonrenewable—or Both?

Some resources can be considered both renewable and nonrenewable. Trees are considered a renewable resource because their supply can be replenished (e.g., more trees can be planted). If, however, an entire forest of 400-year-old trees is cleared and a new-growth forest is planted, the supply of old-growth trees has not been replenished. It takes many generations for an old-growth forest to mature, and so, old-growth trees are considered nonrenewable. Trees are a complex resource because as a forest, their environmental and economic contributions often depend on their age. For example, clearing a forest of 200-year-old Redwoods, unlike clearing a forest of new-growth pines, reduces the corollary biodiversity that is usually found in old-growth forests.

## What Are the Benefits of Natural Resources?

Renewable resources offer a number of environmental and economic benefits over nonrenewable resources. One obvious benefit is the infinite supply of renewable resources—they cannot be depleted. Another benefit of using renewable resources is self-reliance. A country that can provide its own renewable resource, such as solar-powered electricity, need not rely on other countries for an energy source. Additionally, renewable resources offer communities relief during periods of recovery from natural disasters. When communities lose standard services that require the use of natural resources (e.g., electric power or natural gas), renewable resources, such as wind and solar energy systems, are used to provide these services until the usual methods of achieving service can be restored. Following Hurricane Andrew in 1992, for example, a south-Miami subdivision continued to have working streetlights because they were all **photovoltaic** (PV)-powered. The areas became neighborhood gathering spots for a community left without electricity following the storm. In several cases, homes equipped with PV systems were able to keep minimal services running and became emergency shelters for surrounding residents who had lost power.

**Greenhouse Gas:** A gas that absorbs and retains heat from the sun. Greenhouse gases include methane, ammonia, sulfur dioxide, and certain chlorinated hydrocarbons. A buildup of these gases traps warmth in the Earth's atmosphere, changing the global climate.

**Global Climate Change:** Natural- or human-induced change in the average global temperature of the atmosphere near the Earth's surface.

## What Are the Challenges of Using Natural Resources?

Extracting, processing, and using natural resources creates air, water, and land pollution, which can cause global environmental problems. For example, carbon dioxide, which is produced from **deforestation**, and from burning coal, oil, and natural gas (fossil fuels), is a critical **greenhouse gas**. Many scientists believe that the buildup of greenhouse gases in the atmosphere can cause global climate change. Over time, this condition could pose serious dangers around the world, prompting such disasters as flooding, drought, and disease.

In addition, extracting and using resources can disturb relationships within **ecosystems**. For example, the effects of clearing an old-growth forest for wood can destroy habitats used by



## What Are Ecosystems?

Ecosystems are self-regulating communities of plants and animals that interact with one another and with their nonliving environment. Examples of ecosystems include ponds, woodlots, and fields.

Organisms within an ecosystem are connected by energy. Individuals in a community feed on each other, thus transferring energy along a **food chain** or **food web**. In a food chain, energy is transferred from one organism to another in a linear form. For example, the sun provides fuel for a fig tree, which provides sustenance for wasps. The wasps are a food source for spiders, which are eaten by birds. More complex food webs can be thought of as a network, involving energy transfers among several organisms.



many animals, forcing them to find homes elsewhere. If these animals leave an ecosystem, further disturbances can occur within plant and animal populations that depend on these species.

Additionally, with the absence of tall trees in the forest, lower vegetation would lose shade provided by the upper canopy, resulting in increased exposure to sunlight and decreased moisture. Changes in an ecosystem's climatic conditions will eventually change vegetation type, which will alter the kinds of animals that can exist in that community. Over time, if enough ecosystems are affected, an entire community type can change (e.g., over-harvested fields can turn into deserts).



Population growth, increasing affluence, technological change, and urbanization are all responsible for rapidly rising resource consumption all over the world. The relationship between population growth and increased resource use varies among developed and

undeveloped nations. For example, according to the Department of Energy, residents of the industrialized world comprise only 20 percent of the world's population, yet consume 86 percent of its iron and steel, and 76 percent of its timber. Despite the inconsistent relationship between resource use and developed and undeveloped nations, it is apparent that worldwide, more people use more resources. With population, technology, and lifestyle demands growing exponentially, people are using increasing amounts of many natural resources.

## Natural Resource Consumption Facts

- The United States uses one million gallons of oil every 2 minutes.
- Every American uses about 47,000 pounds of newly mined materials each year.
- A television requires 35 different minerals, and more than 30 minerals are needed to make a computer.
- Over the past 40 years, global consumption of wood as industrial fuel rose by nearly 80 percent. North America alone accounts for about 40 percent of both production and consumption of wood as industrial wood products.
- In 2001, each person in the United States threw away an average of 4.4 pounds of waste each day.

(Sources: Natural Resources Defense Council, 1996; National Mining Association, 2000; World Resources Institute, 2000; EPA, 2003.)

## Innovative Technology Using Recovered Materials

Plastic lumber was developed to utilize low-cost materials such as plastic grocery bags and wood chips or sawdust. Used as a wood alternative, plastic lumber offers several advantages over using lumber; it is long lasting, requires limited upkeep, and resists warping and decay. One example of how using plastic lumber can conserve and recover resources is a bridge at Ft. Leonard Wood, Missouri. The construction of the plastic lumber bridge utilized 13,000 pounds of mixed plastics that otherwise would have gone to waste. This exercise in reuse translates into significant natural resource conservation.

## Emerging Trends

Increasing demands for natural resources have spurred new methods for conserving existing resources. More and more companies are developing new and innovative technologies that use recycled materials as raw materials in the manufacture of products. Some steel producers, for example, use minimills and a manufacturing process that uses virtually 100 percent recovered scrap steel as the raw material.

## Recovery—In Action

- More than 65 percent of the steel produced in the United States is made from recovered steel.
- The average aluminum can contains an average of 50 percent post-consumer recycled content.
- By 2003, the paper industry relied on recovered paper for 50 percent of its feedstock.
- Using recovered aluminum cans saves 95 percent of the energy required to make the same amount of aluminum from bauxite, its virgin source.
- Recycling and reuse of 2,000 pounds of paper saves 7,000 gallons of water and 380 gallons of oil.

(Sources: Steel Recycling Institute, 2000; Aluminum Association, 2000; American Forest and Paper Association, 2000; The Can Manufacturers Institute, 1997; Weyerhaeuser Company, 1999.)

## How Can You Help?

An increasing number of individuals are also practicing **conservation** methods by using less—such as buying products with less packaging. Certain lifestyle changes, such as composting food scraps rather than buying fertilizer, also preserve natural resources. Other suggestions

for ways to practice conservation of natural resources include:

- Reducing waste by reusing paper grocery and lunch bags or eliminate waste by using cloth bags.
- Donating old toys, clothes, furniture, cars, and other items to organizations such as the Salvation Army rather than throwing them in the garbage.
- Closing the recycling loop by purchasing recycled-content products and packaging.

## Additional Information Resources:

Visit the following Web sites for more information on natural resources and solid waste:

- U.S. Environmental Protection Agency (EPA): <[www.epa.gov](http://www.epa.gov)>
- U.S. EPA Office of Solid Waste composting site: <[www.epa.gov/epaoswer/non-hw/composting/index.htm](http://www.epa.gov/epaoswer/non-hw/composting/index.htm)>
- World Resources Institute: <[www.wri.org](http://www.wri.org)>
- Natural Resources Defense Council: <[www.nrdc.org](http://www.nrdc.org)>
- United States Department of Energy's National Renewable Energy Laboratory: <[www.nrel.gov](http://www.nrel.gov)>
- United States Department of Energy's Center of Excellence for Sustainable Development: <[www.sustainable.doe.gov](http://www.sustainable.doe.gov)>

To order the following item on municipal solid waste, call EPA toll-free at (800) 490-9198 or look on the EPA Web site <[www.epa.gov/epaoswer/osw/publicat.htm](http://www.epa.gov/epaoswer/osw/publicat.htm)>.

- *A Collection of Solid Waste Resources* on CD-ROM