Chapter 6 Section 1: Interconnected Planet

Key Vocabulary Terms

1

Adapted from Holt Biology 2008
Fossil Fuel

Nonrenewable energy resource formed from the remains of organisms that lived long ago; oil, coal, and natural gas.
Content Objectives

Write these down!

I will be able to identify:

- How humans and environments are connected.
- The difference between renewable and nonrenewable resources.
- How the state of the environment affects the health and quality of life of a person.
Language Objectives

Write these down!

I will complete a graphic organizer on key terms associated with our interconnected planet. Defining terms in my own words.

- I will discuss and record important ideas, facts, and concepts about the our interconnected planet using Cornell Notes.
Chapter 6
Section 1: Interconnected Planet

Notes
YOUR TURN
Active Reading
Section 1 – An Interconnected Planet
Humans and the Environment

Humans now live in almost every kind of ecosystem on Earth.
As human population increases, the impact of humans on the environment increases and need for resources grows.
Humans and the Environment cont.

Earth is an interconnected planet: we depend on the environment, and the environment is affected by our actions.
Humans and the Environment, cont.

Learning about this connectedness helps us care for the environment and ensures that the environment will continue to support us and other species on Earth.
THINK, SHARE, & WRITE #1

How is Earth an interconnected planet?
THINK, SHARE, & WRITE #1

How is Earth an interconnected planet?

Humans and other organisms are part of the environment and depend on resources from the environment to survive. In turn, the environment is affected by the actions of humans and other organisms.
Resources

Earth’s resources are described as **renewable** or **nonrenewable**.
Renewable resources are natural resources that can be replaced at the same rate at which they are consumed.
Resources

However, a resource can be renewable but still be used up if it is used faster than it can be renewed.
Resources Activity

1. Work with a partner to list some renewable resources.

2. Circle those renewable resources that you think we are using up faster than they can be replenished.
Renewable resources:
- fresh water
- fruits
- vegetables
- oxygen
- wood for construction and paper
- meat: beef, chicken, seafood
- solar energy
- wind energy
- thermal power from the earth
Nonrenewable resources are resources that form at a rate that is much slower than the rate at which they are consumed.
Fossil fuels - are nonrenewable energy resources that formed from the remains of organisms that lived long ago.
Fossil fuels such as coal, oil, and natural gas, are nonrenewable resources because it takes millions of years for them to form.
When these resources are gone, millions of years will pass before more will form.
Explain why natural gas is a nonrenewable resource?
Explain why natural gas is a nonrenewable resource?

It takes millions of years for natural gas to form.
The Environment and Health

Pollution and habitat destruction destroy the resources we need to live, such as the air we breathe, the water we drink, and the food we eat.
Chapter 6 Section 2: Environmental Issues

Key Vocabulary Terms

5

Adapted from Holt Biology 2008
Acid Rain

Precipitation that has a pH below normal and has an unusually high concentration of sulfuric or nitric acids, often the result of chemical pollution.
Global Warming

A gradual increase in the average global temperature.
Greenhouse Effect

The normal process of warming of the surface and lower atmosphere of Earth when carbon dioxide, water vapor and other gases in the air absorb heat.
Erosion

A process where Earth’s surface is loosened, dissolved, or worn away and transported by wind, water, ice, or gravity.
Deforestation

The process of clearing forests.
Content Objectives
Write these down!

I will be able to identify:

- The effects of air pollution.
- How burning fossil fuels leads to climate change.
- Some sources of water pollution.
- Why soil erosion is a problem.
- How ecosystem disruption affects humans.
Air pollution causes respiratory problems for people, results in acid rain, damages the ozone layer, and may affect global temperature.
Acid rain

Acid rain is precipitation that has an unusually high concentration of sulfuric or nitric acids, which is caused by pollution, and damages the environment.
YOUR TURN
Active Reading
Section 2 – Environmental Issues
The ozone layer - protects life on Earth from the sun’s damaging ultraviolet (UV) rays.
The ozone layer has been damaged by *chlorofluorocarbons (CFCs)*.
Ozone “Hole” Over Antarctica
Global Warming

Global warming is the gradual increase in the average global temperature.
Global Warming

- The **greenhouse effect** is the warming of the surface and lower atmosphere of Earth that happens when greenhouse gases in the air absorb and reradiate heat. Examples of greenhouse gases are CO$_2$ and water vapor.

- **The greenhouse effect is necessary to keep Earth’s temperatures stable.**

(page 3)
Solar radiation from the Sun interacts with the Earth's atmosphere. Very little energy escapes directly into space. Greenhouse gases in the atmosphere trap energy, heating the Earth's surface. Much of the energy is reflected back to Earth.
Earth’s global temperatures have been rising steadily for many decades.
Burning **fossil fuels** increases the amount of CO$_2$ in the atmosphere. Increases in atmospheric CO2 **may be** responsible for an increase in global temperatures.
Earth Clock from poodwaddle.com

1. Read the information with a partner.
2. Write your reactions to the data on the worksheet provided.
A continued increase in global temperatures has the potential to cause a number of serious environmental problems.
Possible damage from global warming includes melting ice sheets, sea level rise, destruction of coastal ecosystems, and changes in weather patterns.
How might the burning of fossil fuels affect climate?
THINK, SHARE, & WRITE #3

How might the burning of fossil fuels affect climate?

The burning of fossil fuels releases CO$_2$ into the atmosphere. An increase in CO$_2$ in the atmosphere due to the burning of fossil fuels may be responsible for an increase in global temperatures.
Water Pollution

- Water pollution can come from fertilizers and pesticides used in: agriculture, livestock farms, industrial waste, oil runoff from roads, septic tanks, and unlined landfills.

- **Pollution** enters groundwater when polluted surface water percolates down through the soil.
Figure 5 Pollutants on Earth’s surface run off the land and into ground water and other water systems. List the sources of water pollution that might occur in your neighborhood.
List three sources of water pollution.
List three sources of water pollution.

Run off from roads,
Leaking underground septic tanks,
& Pesticides that run off from farms.
Soil Damage

Fertile soil allows agriculture to supply the world with food.
Soil Damage

Nutrients that make soil fertile come from the weathered rock, bacteria, fungi and the remains of organisms.

The processes that form only a few centimeters of fertile soil can take thousands of years.
Soil Erosion

Erosion is a process in which the materials of Earth’s surface are worn away and transported from one place to another by wind, gravity, or water.
Soil Erosion

Many farming methods can lead to soil erosion by loosening the topsoil and removing plants that hold the soil in place.
Sustainable agricultural practices can prevent erosion

Terracing changes a steep field into a series of flat steps that stop gravity from eroding the soil.
Sustainable agricultural practices can prevent erosion

Planting a *cover crop*, such as soybeans, restores nutrients to the soil.
Sustainable agricultural practices can prevent erosion

**Crop rotation**, or planting a different crop every year, slows down the depletion of nutrients in the soil.
Sustainable agricultural practices can prevent erosion

In *contour plowing*, rows are plowed in curves along hills instead of in straight lines. The rows then act as a series of dams, which prevent water from eroding the soil.
How does erosion damage soil?
Erosion causes soil to be washed away. Without soil, crops cannot be grown.
Ecosystem Disruption

Can result in loss of biodiversity, food supplies, potential cures for diseases, and the balance of ecosystems that supports all life on Earth.
Over the last 50 years, about **half** of the world’s tropical rain forests have been cut down or burned for timber, pastureland, or farmland. This process of clearing forests is called **deforestation**.
Ecosystem Disruption cont.

Habitat destruction and damage cause more extinction and loss of biodiversity than any other human activities do.
Ecosystem Disruption cont.

**Biodiversity** is the variety of organisms in a given area.
Biodiversity affects the stability of ecosystems and the sustainability of populations.
Humans have disrupted ecosystems by intentionally and unintentionally introducing nonnative species. (Invasive Species)
Many species are on the edge of extinction. **Extinction** is the death of every member of a species.
How has the introduction of the zebra mussel into the Great Lakes affected humans?
How has the introduction of the zebra mussel into the Great Lakes affected humans?

The zebra mussel clogs treatment facilities and causes millions of dollars in damages.
Chapter 6 Section 3: Environmental Solutions

Key Vocabulary Terms

2

Adapted from Holt Biology 2008
Recycling

The process of recovering valuable or useful materials from waste or scrap.
Ecotourism
Tourism that supports the conservation of ecologically unique areas.
Chapter 6
Section 3: Environmental Solutions

Notes

Adapted from Holt Biology 2008
Content Objectives

Write these down!

I will be able to identify:

- How conservation and restoration can solve environmental issues.
- How research and technology affect the environment.
- How education and advocacy play a part in preserving the environment.
- Why it is important for societies to consider environmental impact when planning for the future.
YOUR TURN
Active Reading
Section 3 – Environmental Solutions
YOUR TURN

- With a partner, read Chapter 6 Section 3 Active Reading – Environmental Solutions
- Take turns reading the questions aloud
- Then take turns reading the paragraph aloud to each other, alternating sentences.
YOUR TURN

- Discuss what you have read with your partner. Decide on the best answer to each question.
- Record your answer?
- Be prepared to share with the class!

Adapted from Holt Biology 2008
Conservation and Restoration

Two major techniques for dealing with environmental problems are conservation and restoration.
Conservation – protecting existing natural habitats.
Restoration – cleaning up and restoring damaged habitats.
What is the difference between restoration and conservation?
What is the difference between restoration and conservation?

Restoration involves cleaning up and restoring a damaged ecosystem. Conservation involves protecting an existing ecosystem.
Reduce Resource Use

Draw this symbol in the margin.
Give it this title:
REDUCE, REUSE, RECYCLE
One of the best ways that you can help solve environmental problems is by reducing the amount of energy that you use and the amount of waste that you produce.
Reduce Resource Use

The process of reusing things instead of taking more resources from the environment is called recycling.
Think, Share, & Write #8

What are three ways you can reduce your use of resources?
THINK, SHARE, & WRITE #8

What are three ways you can reduce your use of resources?

I can reduce resource use by using recycled materials, low-flow toilets, and low-flow shower heads, etc.
Technology

Research and technology can help protect our environment by providing cleaner energy sources, better ways to deal with waste, and improved methods for cleaning up pollution.
How can fuel-efficient hybrid cars help solve environmental problems?
How can fuel-efficient hybrid cars help solve environmental problems?

By releasing less pollution into the atmosphere than the average car does. They also reduce the consumption of nonrenewable fossil fuels.
Environmental Awareness

Conservation groups make efforts to educate people, protect land, and influence laws through advocacy.
Environmental Awareness

Some organizations work on an international level. Others work on local environmental problems.
Ecotourism is one way to educate the public about the environment. Ecotourism is a form of tourism that supports conservation of the environment.
How can advocacy and education help solve environmental problems?
How can advocacy and education help solve environmental problems?

By having people become more aware of the problems and by motivating people to help solve the problems.
Planning for the future can help us avoid damaging the environment and can help us solve the environmental issues that we face.
Planning for the Future

When governments and people plan for the future, they can protect resources for the community for years to come.
Why do we need to evaluate effects of development before following through with development?
THINK, SHARE, & WRITE #11

Why do we need to evaluate effects of development before following through with development?

Because we can then avoid damage to the environment.