Ecology

Chapter 3: Human Impact on Ecosystems

**Lesson 3.1 - Human population growth presents challenges.**

**Lesson 3.2 - Human activities affect the environment.**

**Lesson 3.3 - People are working to protect ecosystems.**

**Key Words / Pictures / Graphic Organizers**

***Sec. 3.1 - Human population growth presents challenges.***

**The Human Population is increasing. (p. 81)**

In \_\_\_\_\_ short years (from 1999 to 2011) the United Nations reported that the Earth gained \_\_\_ billion people. \_\_\_\_\_ billion to \_\_\_\_ billion!

\_\_\_\_\_ billion people by \_\_\_\_\_\_\_\_\_.

* more \_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_
* people are living \_\_\_\_\_\_\_\_\_\_\_\_\_ due to \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Earth will reach its \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ for \_\_\_\_\_\_\_\_\_\_\_\_\_ at some point

* some say the point has been hit

**Human populations can put pressure on ecosystems. (p. 82)**

**Pressures of Waste Disposal**

Humans produce \_\_\_\_\_\_\_\_\_\_\_\_\_ - water carries this waste

Water is \_\_\_\_\_\_\_\_\_\_\_\_ to remove harmful \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ still make it into rivers, lakes, and oceans, harming \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Human activity creates:**

\_\_\_\_\_\_\_\_\_\_\_\_\_ - food waste & \_\_\_\_\_\_\_\_\_\_ - nonfood waste

- both end up in \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ trash and garbage create dangerous \_\_\_\_\_\_\_\_\_\_\_\_\_ into the air and ground

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_! - that would release harmful gases and chemicals into the air.... DARN!

**Pressures on Resources**

Humans take \_\_\_\_\_\_\_\_\_\_\_\_\_\_ away from the environment.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- type of material or energy that humans use to meet their needs.

Include: water, \_\_\_\_\_\_\_\_\_\_\_, wood, stone, \_\_\_\_\_\_\_\_\_\_ & minerals

\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ is an important resource.

* only \_\_\_\_% of water on Earth is freshwater
* \_\_\_\_\_\_ of that is in the ice caps - leaves \_\_\_\_%!?!?!

Many \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ depend on precious metals mined from the earth.

Pressures of Urban Growth

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** - the measure of the number of people in an area

higher pop. d. = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

lower pop. d. = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Increasingly, people \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are living in large cities (50% currently)

More and more resources for cities need to come from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the area

**Pressures of Expanding Land Use**

Demand for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ takes up land.

Increased \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ need more land to live on.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are destroyed

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is affected

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into rivers and lakes

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ farmland is replaced by development.

- Less land is used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- Food is transported from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ away

- Suburban growth stresses need on cars for transportation.

More \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ > air quality decreases

More \_\_\_\_\_\_\_\_\_\_ needed > interrupt habitats & endanger animals

***Sec. 3.2 - Human activities affect the environment.***

**Humans use many resources. (p. 89)**

Throughout \_\_\_\_\_\_\_\_\_\_\_\_\_\_, people around the world have relied on \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ for survival

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make tools

- \_\_\_\_\_\_\_\_\_\_\_\_ for keeping warm and cooking

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be replaced naturally or by humans in a short amount of time.

- can run out if managed poorly or overused

Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are resources that cannot be replaced.

- may be replenished, but not quickly enough for humans to use (oil)

Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Pollution endangers biodiversity. (p. 91)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-** the addition of harmful substances to the environment.

- caused by the many ways that humans use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- can be released into the \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_, & \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

- pollutants include \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Plant and animal populations may \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and biodiversity may \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ due to pollution.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -** the number and variety of life forms within an ecosystem.

Air Quality

Today in the U.S., \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_, factories, and power plants are the main sources of air pollution.

- they affect humans and plants

- can cause \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Acid Rain occurs when air pollutants such as sulfur dioxide and nitrogen dioxide \_\_\_\_\_\_\_ with water in the atmosphere

Acid rain has been very harmful in areas without rich soil to help correct the rain's \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- Adirondack Mountains, NY

Water Quality

Like air pollution, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ affects entire ecosystems.

Water pollution can be caused by chemicals or waste that drain off of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ like untreated waste and storm water drain off the land into the river.

When pollution is exposed to fish and amphibians, the entire \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ is affected.

**Habitat loss endangers biodiversity. (p. 94)**

Removing Habitat

One way human activities affect habitats is by \_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_ of natural resources available to living things.

Because of land development, forests that once stretched for hundreds of miles have been \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-- broken apart into small patches.

Changing Habitat

Habitat \_\_\_\_\_\_\_\_\_\_ can also happen when humans move species into new habitats, either on purpose or by accident.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ species can take over entire ecosystems.

The changing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can disrupt the entire food web.

***Sec. 3.3 - People are working to protect ecosystems.***

**Environmental awareness is growing. (p. 98)**

\_\_\_\_\_\_\_\_\_ - Foresters and naturalists began to take interest in preserving wild areas they saw rapidly disappearing.

\_\_\_\_\_\_\_\_\_\_- World's first national park (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) was established.

\_\_\_\_\_\_\_\_ - The book "Silent Spring" raised public awareness to the harmful effects of chemicals on the environment.

\_\_\_\_\_\_\_\_\_ - Important laws were passed to \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the environment.

**Local Efforts**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ protecting habitats and the organisms that depend on them happen at the local level.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - communicate with politicians, publishing articles, talking to the news media, purchasing and setting aside land for preservation.

Federal Efforts

The U.S. gov. works with scientists to write laws that ensure companies and individuals work together to conserve natural resources and maintain healthy ecosystems.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Act

- \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ Act & \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ Act

(control different kinds and amounts of pollutants can be put into the air and water.)

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ (EPA) enforces all federal environmental laws.

**Conserving resources protects ecosystems. (p. 102)**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - ways of living and doing business that use natural resources without using them up.

Ex.: developing new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ resource use, and creating less \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Improving Resource Use**

Changing the way people manage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

- Nearly \_\_\_\_\_\_\_ of U.S. farms practice conservation tillage, a method that involves planting seeds without plowing the soil, which reduces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

- Cutting trees \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ instead of clear-cutting.

- Energy companies are developing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy sources other than fossil fuels.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ power is using the heat of molten rock in the Earth's interior.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plants use dams and the flow of water to generate electricity.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ power is generated in areas that are very windy and sunny.

**Reducing Waste and Pollution**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, such as trains and buses, work to reduce waste and pollution.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reduced emissions and fossil fuels needed.

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Using technology to telecommute, or work from home.

Ways to reduce at home:

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ appliances

- lowering \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

- adding \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around doors and windows

- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ waste materials

**Think globally, act locally. (p. 105)**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ facing society are great.

Providing Earth's growing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with clean air and water and with energy for warmth and transportation are only some of the many tasks.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ continue to learn about the interactions in ecosystems and how important ecosystems are to humans.

Thinking \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - understanding the effects of society's decisions about resources, development, and transportation.

Act \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - become involved in efforts to reduce the use of limited resources and to restore ecosystems.

Possible Research Project Topics

* The human population is increasing. (p. 81)
* Waste disposal by humans can put pressures on ecosystems. (p. 82)
* Human use of resources can put pressures on ecosystems. (p. 84)
* Human’s urban growth can put pressures on ecosystems. (p. 86)
* Human expanding land use can put pressures on ecosystems. (p. 87)
* Humans use many renewable resources. (p. 90)
* Humans use many nonrenewable resources. (p. 90)
* Air pollution endangers biodiversity. (p. 92)
* Water pollution endangers biodiversity. (p. 93)
* Pollution across systems endangers biodiversity. (p. 94)
* Removing habitats endangers biodiversity. (p. 94)
* Changing habitats endangers biodiversity. (p. 95)
* Local effort to raise environmental awareness is growing. (p. 99)
* Federal effort to raise environmental awareness is growing. (p. 100)
* Improving resource use protects ecosystems. (p. 102)
* Reducing waste and pollution protects ecosystems. (p. 104)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (with Mr. C. approval)