

Unit 1 Chapter 1.1

Environmental Science

Kraj



What Is Environmental Science?

- **Environmental Science** is the study of the impact of humans on the environment.
- Includes air, water, and land



Goals of Environmental Science

- Understand and **solve** environmental problems.
- Studies interactions between humans and the environment
 - 1) How our actions alter (change) our environment.
 - 2) The use of natural resources.



Fields of Study

- Environmental science is an **interdisciplinary** – many fields (areas) of study.
- Important to the foundation is **ecology**.
- **Ecology** is the study of interactions of living organisms with one another and with their non-living environment.



Fields of Study

Major Fields of Study That Contribute to Environmental Science

Biology is the study of living organisms.

Zoology is the study of animals.
Botany is the study of plants.
Microbiology is the study of microorganisms.
Ecology is the study of how organisms interact with their environment and each other.

Earth science is the study of the Earth's nonliving systems and the planet as a whole.

Geology is the study of the Earth's surface, interior processes, and history.
Paleontology is the study of fossils and ancient life.
Climatology is the study of the Earth's atmosphere and climate.
Hydrology is the study of Earth's water resources.

Physics is the study of matter and energy.

Engineering is the science by which matter and energy are made useful to humans in structures, machines, and products.

Chemistry is the study of chemicals and their interactions.

Biochemistry is the study of the chemistry of living things.
Geochemistry, a branch of geology, is the study of the chemistry of materials such as rocks, soil, and water.

Social sciences are the study of human populations.

Geography is the study of the relationship between human populations and Earth's features.
Anthropology is the study of the interactions of the biological, cultural, geographical, and historical aspects of humankind.
Sociology is the study of human population dynamics and statistics.

REVIEW

1. What is Environmental Science? _____

2. Name three fields of study in Environmental Science. _____

3. What is a goal of Environmental Science? _____

History: Hunter-Gatherers

- Obtained food by **collecting** plants and by **hunting** wild animals.
- They moved around and had **temporary housing**.
- Impacts on the environment:
 - 1) Native American tribes hunted buffalo.
 - 2) Set fires to burn prairies and prevent the growth of trees. –Made an open area for hunting



History: Hunter-Gatherers

- In North America, rapid climate changes and **overhunting** led to the **extinction** of some animal species.
- Examples:
 - 1) Giant sloths
 - 2) Giant bison
 - 3) Mastodons
 - 4) Saber-toothed cats



REVIEW

- Describe the hunter-gathers. _____

History: Agricultural Revolution

- **Agriculture** is the practice of growing, breeding, and caring for plants and animals for our basic needs. – **Farming**
- Human populations began to grow faster.
- Settled in permanent housing in closer areas putting pressure on the environment.



History: Agricultural Revolution

The **slash-and-burn technique** converted land to farmland.

Much land was poorly farmed and is unable to grow crops.



REVIEW

- Describe the agricultural revolution. _____

History: Industrial Revolution

- Shift in energy sources to **fossil fuels (coal and oil)**
- Increased efficiency of agriculture, industry, and transportation.
- Motorized vehicles enabled food to be transported greater distances.



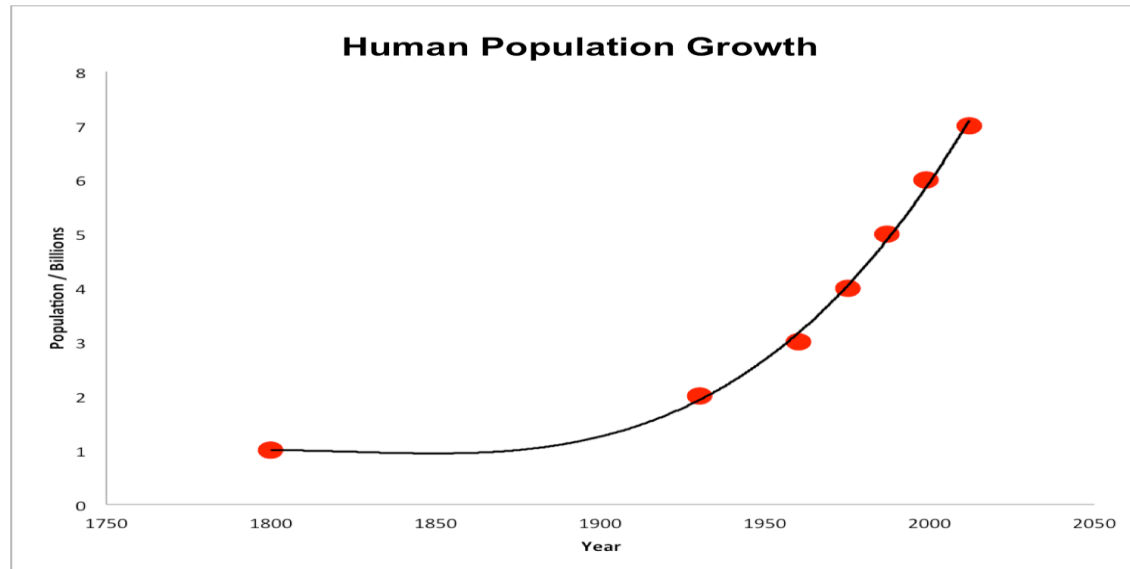
History: Industrial Revolution

- **Pollution and habitat loss** environmental problems.
- **Plastics, artificial pesticides, and fertilizers** developed.



History: Industrial – Medical Revolution

- Improvements in medicine and sanitation enabled the **human population** to grow **exponentially**.
- Pressure on the environment will continue to increase as need for food and resources grow.

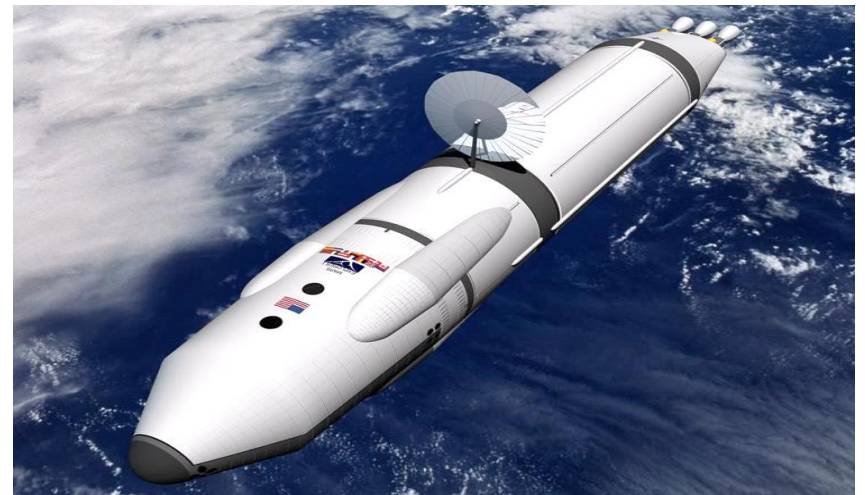


REVIEW

- Describe the industrial revolution. _____

Spaceship Earth

- Earth is like a spaceship, it cannot dispose of its waste or take on new supplies.
- It is a **closed system**, only energy from the sun enters and heat leaves.
- Problem because as human population grows, more limited resources needed and more waste created.



Main Environmental Problems

- 3 categories:
 - 1) Resource Depletion
 - 2) Pollution
 - 3) Loss of Biodiversity



Resource Depletion

- **Natural Resources** a material found in nature and used by humans
- Examples: water, oil, minerals, forests, animals
- Classified as renewable or nonrenewable



Resource Depletion

- **Renewable resources** can be replaced relatively quickly by natural process.
- **Nonrenewable resources** form at a much slower rate than they are used.

Renewable and Nonrenewable Resources	
Renewable	Nonrenewable
energy from the sun	metals such as iron, aluminum, and copper
water	nonmetallic materials such as salt, sand, and clay
wood	
soil	
air	fossil fuels

Pollution

- Pollution in the environment, something that has a **harmful** or poisonous effect.
- Examples: wastes, heat, noise, burning of **fossil fuels**, or radiation
- Much of the pollution problems are produced by **human activities**.



Loss of Biodiversity

- **Biodiversity** – The number, variety, and genetic variation of organisms living in an area.
- Important for us because we need other organisms for **food, oxygen, and medicine.**
- Many species who have ever lived are now **extinct.**



REVIEW

1. How is Earth like a spaceship? _____

2. What are the 3 main categories of environmental problems?

Multiple Choice

1. How do scientists characterize a nonrenewable resource?
 - A. a resource that is used by humans
 - B. a resource that can not be replaced
 - C. a resource that can be replaced relatively quickly
 - D. a resource that takes more time to replace than to deplete

Multiple Choice

2. Which of the following is an important foundation of environmental science?
- A. ecology
 - B. economics
 - C. meteorology
 - D. political science

Multiple Choice

3. Which of the following phrases describes the term biodiversity?
- A. species that have become extinct
 - B. the animals that live in an area
 - C. species that look different from one another
 - D. the number and variety of species that live in an area