

# **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

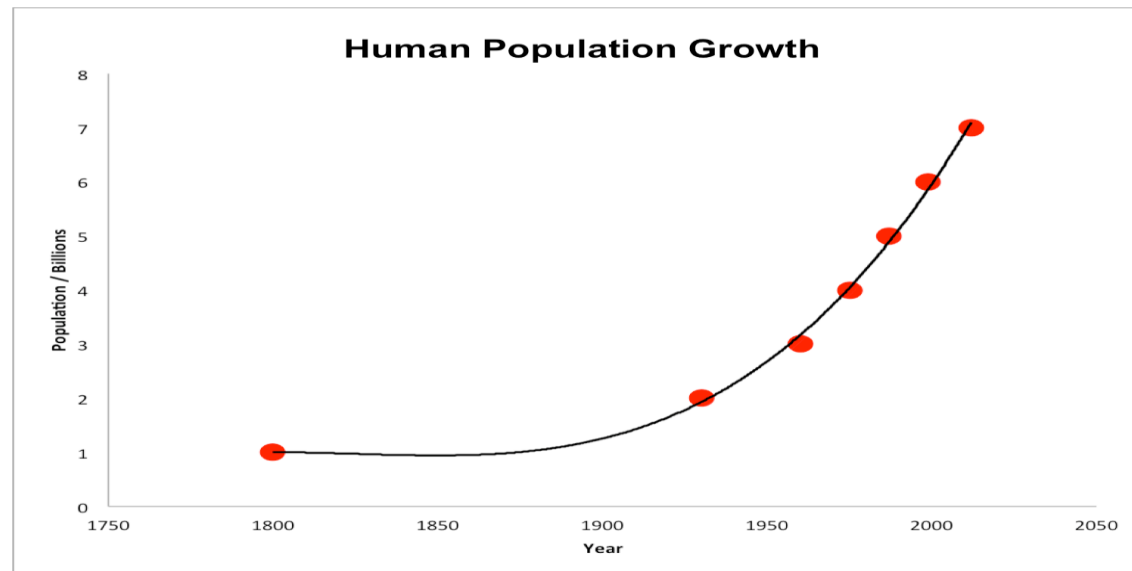
- **Pollution** and **habitat loss** environmental problems.
- **Plastics**, **artificial pesticides**, and **fertilizers** developed.





# 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. \_\_\_\_\_

---

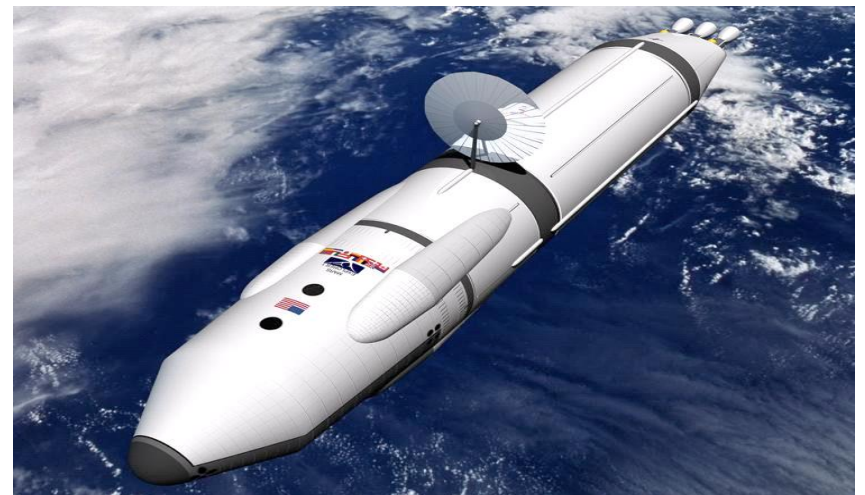
---

---

---

# 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	fossil fuels
soil	
air	



# 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