

## CORNELL NOTES

Directions: You must create a minimum of 5 questions in this column per page (average). Use these to study your notes and prepare for tests and quizzes. Notes will be stamped after each assigned sections (if completed) and turned in to your teacher at the end of the Unit for scoring.

# UNIT 5: ECOLOGY

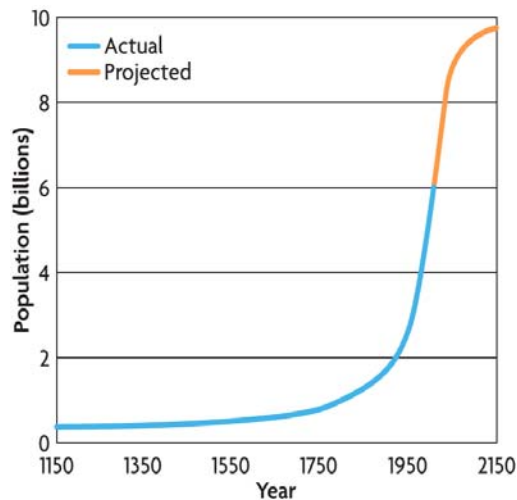
## Chapter 16: Human Impact on Ecosystems

### I. Human Population Growth and Natural Resources (16.1)

A. Earth's human population continues to \_\_\_\_\_

#### 1. Earth's Carrying Capacity

a. **Thomas** \_\_\_\_\_ (late 1700's)- studied human population growth and said was growing faster than Earth's \_\_\_\_\_



b. Modern scientists use his observations and predictions when describing ecosystem's \_\_\_\_\_

c. Current human population is about \_\_\_\_ billion.

d. Not sure what the limit (carrying capacity) is for size of human population.

#### 2. Technology and Human Population

a. Humans have modified their environment through agriculture, transportation, medical advances, sanitation, etc. This \_\_\_\_\_ the **carrying capacity**

b. \_\_\_\_\_ have allowed Earth to support far more people than Malthus could have imagined.

B. The growing human population exerts pressure on Earth's natural \_\_\_\_\_

1. **nonrenewable resources**- they are used faster than they are \_\_\_\_\_ (e.g. oil, natural gas, coal)

2. **renewable resources**- resources that \_\_\_\_\_ be used up or can \_\_\_\_\_ themselves over time (e.g. wind energy, solar, lumber, etc.)

a. As human population continues to \_\_\_\_\_, management of renewable and nonrenewable resources will play important role

b. Today, the U.S. uses more resources and generates more waste than any other country (\_\_\_\_\_ of waste per person per year)

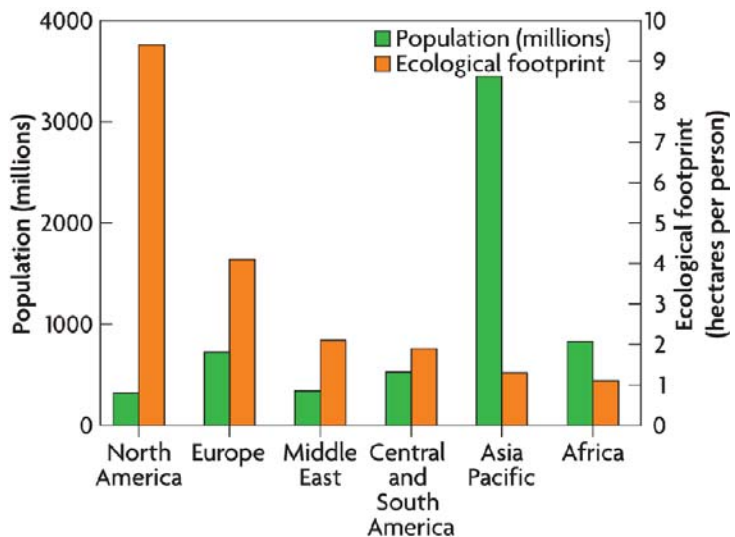
C. Effective management of Earth's resources will help meet the needs of the future

1. Effects both current and future \_\_\_\_\_

2. **Ecological** \_\_\_\_\_ - The amount of land necessary to produce and maintain enough food and water, shelter, energy and waste

a. Varies from country to country (smaller in \_\_\_\_\_ countries)

b. Developing countries like China and India have smaller footprint per individual, but many more \_\_\_\_\_



## II. Air Quality (16.2)

A. \_\_\_\_\_ accumulate in the \_\_\_\_\_

1. \_\_\_\_\_ - describes any undesirable factor, or pollutant, that is added to the air, water, or soil

a. Effect can be \_\_\_\_\_ or **delayed**

b. Effects may **add up over time** and disrupt functions of \_\_\_\_\_

2. Smog and Ozone

a. \_\_\_\_\_ - type of air pollution caused by interaction of sunlight with pollutants produced by fossil fuel emissions

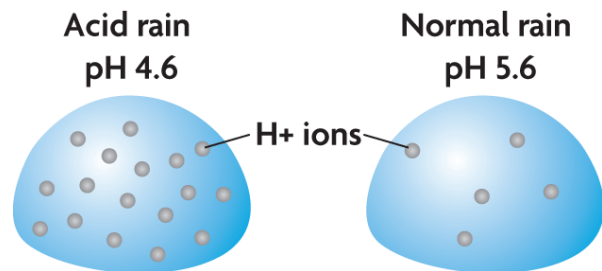
b. \_\_\_\_\_ - microscopic bits of dust, metal, and unburned fuel (1-10 microns in size) that are produced by many different industrial processes

c. \_\_\_\_\_ - produced by reactions of nitrogen oxide and oxygen forming ozone ( $O_3$ )

1). ozone \_\_\_\_\_ to organisms

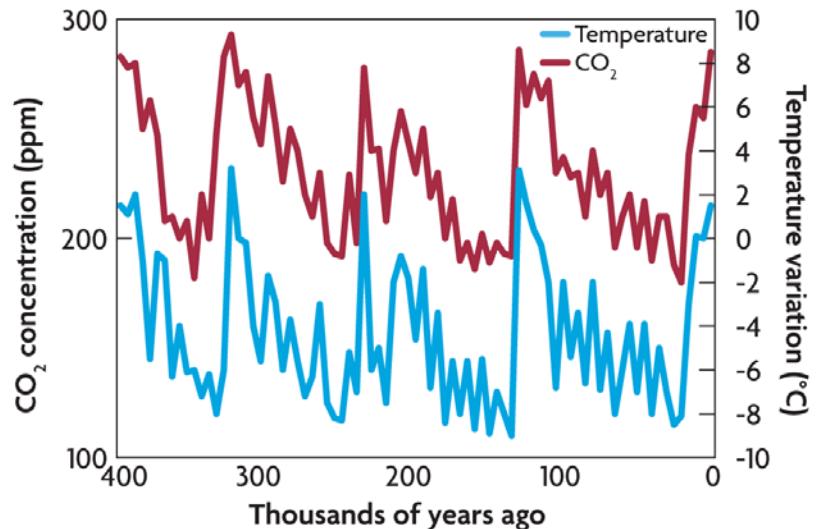
2). Also forms important **protective layer** in atmosphere to protect against \_\_\_\_\_ rays found in \_\_\_\_\_

d. \_\_\_\_\_ **Rain-** chemicals from fossil fuel emissions can lead to formation of acid rain that can affect many environments



B. Air pollution is changing Earth's \_\_\_\_\_

1. Scientists have been studying the periodic changes in Earth's \_\_\_\_\_ and relationship to \_\_\_\_\_ levels



2. **Greenhouse effect-** greenhouse gasses act like \_\_\_\_\_ to slow loss of heat through atmosphere

a. Include:

b. Absorb **infrared radiation** trying to escape into \_\_\_\_\_ from Earth's surface

3. **Global warming**- the trend of increasing global \_\_\_\_\_

a. Changes are \_\_\_\_\_ part of Earth's climate cycle

b. **Human impact** may be \_\_\_\_\_ up production of greenhouse gasses and global warming

c. Predict temperature increase of \_\_\_\_ - \_\_\_\_°C by the year \_\_\_\_\_. Could dramatically effect Earth's biosphere

### III. Water Quality (16.3)

A. **Water pollution** affects \_\_\_\_\_

1. Chemical contaminants, raw sewage, trash, etc. end up in rivers, lakes, and \_\_\_\_\_ all over the world

2. \_\_\_\_\_ **species**- a species that can provide a sign, or indication, of the quality of the ecosystems environmental conditions

B. **Biomagnification** causes accumulation of toxins in the food chain

1. \_\_\_\_\_ - as pollutant moves up the food chain, it's \_\_\_\_\_ **increases**

2. Many pesticides dramatically effect top level consumers (\_\_\_\_\_)

### IV. Threats to Biodiversity (16.4)

A. Preserving \_\_\_\_\_ is important to the future of the biosphere

1. The loss of \_\_\_\_\_ and growing **pollution** problems are affecting animal and plant population around the world

2. The **loss of biodiversity** has a long term effects on \_\_\_\_\_ of ecosystems

B. Loss of habitat eliminates \_\_\_\_\_

1. As human population grows and expands into new areas, they \_\_\_\_\_ large numbers of wildlife

2. **Habitat** \_\_\_\_\_ - when barrier forms that prevents an organism from accessing its entire \_\_\_\_\_  
**range**

a. **Growing problem** (urban \_\_\_\_\_)

b. Beginning to address problems

C. Introduced species can disrupt \_\_\_\_\_ relationships in ecosystem

1. **Introduced species**- any organism that was brought to an ecosystem as the result of \_\_\_\_\_ activities

a. Can have detrimental effect on \_\_\_\_\_ species

b. Can out-\_\_\_\_\_ native species and drive them out

2. **Economic damage**- can have major impact on humans as well as ecosystems

V. Conservation (16.5)

A. Sustainable development manages resources for present and future generations

1. \_\_\_\_\_ **development**- a practice in which natural resources are used and managed in a way that meets current needs without hurting future generations

a. Covers wide range of resource \_\_\_\_\_

b. Has changed way we \_\_\_\_\_ natural resources

B. Conservation practices focus on a few species but benefit entire ecosystems

1. **Endangered Species Act**- designed to protect individual \_\_\_\_\_ by establishing \_\_\_\_\_ for organism and its environment

2. Often called \_\_\_\_\_ **species** (listed species), because its protection also protect wide range of other species

3. As result, **entire** \_\_\_\_\_ **can benefit** from efforts to save a single species

## B. Protecting Earth's resources helps protect our future

1. Global warming, pollution, and loss of biodiversity are only a few of the direct threats to our planet

2. Protecting Natural resources

a. \_\_\_\_\_ - created as part of **National Environmental Policy Act** in \_\_\_\_\_

b. Led to development of **policies** and **regulations** to protect environment across U.S.

1). **Clean Air Act, Clean Water Act, Endangered Species Act** have major impact on environment

2). Has greatly increased \_\_\_\_\_

c. Formation of \_\_\_\_\_ to preserve large areas of wilderness has protected ecosystems

3. A sustainable Earth- **humans** represent an integral part of Earth's ecosystems

a. We have ability to \_\_\_\_\_ how fast our \_\_\_\_\_ grows, through controlling \_\_\_\_\_ rates

b. We can develop \_\_\_\_\_ to produce **more** \_\_\_\_\_ and produce **less** \_\_\_\_\_

c. We have ability to change our \_\_\_\_\_ and take \_\_\_\_\_ to protect and maintain ecosystems.