Earth’s resources

• As the human population ___________________________, the demand for resources________________________.

• Earth’s carrying capacity is actually unknown.

• What is carrying capacity?
  – ________________________________________________________________

• Earth’s population is around ________________________________.

Technology and Human Population

• As humans modify their environment through
  – ________________________________________________________________
  – ________________________________________________________________
  – ________________________________________________________________
  – ________________________________________________________________

• Examples of technology:
  – ________________________________________________________________ – makes possible for the production of large quantities of food
  – ________________________________________________________________ – reduced infant mortality rates

Types of Resources

• Growing human population exerts pressure on Earth’s natural resources
  – ________________________________________________________________
  – ________________________________________________________________

• ________________________________________________________________
  over millions of years provides humans with oil and coal

Nonrenewable Resources

• ________________________________________________________________

• Used faster than they form

• Growing use of this resource will eventually lead to an
  ________________________________________________________________

• Fun fact: In 2006, humans were using oil at a rate of about 77 million barrels per day.

Renewable Resources

• ________________________________________________________________

• Cannot be used up or replenish themselves over time
  – Examples:
    • ________________________________________________________________ captured by wind turbines
    • ________________________________________________________________ captured by solar panels
Limits of Resources

• Renewable resources are ____________________________ unlimited!
  – Fresh water is renewable but can become limited by ____________________________.

Drinking Water – As Renewable Resource

• Pollution and overuse threaten its supply
  – ___________________________________________________________
  – ___________________________________________________________
  – ___________________________________________________________

Sustainable Use

• Is a way of using natural resources
  – A sustainable system operates without causing ____________________________
    ___________________________________________________________
  – Example:
    • ___________________________________________________________
    • ___________________________________________________________
    • ___________________________________________________________

The Green Revolution

• The __________________________________________________________ was introduced in the 1960’s by the government as __________________________________________________________________________________________________.
  – Using ____________________________________________ large fields cleared, plowed, and planted with the same crops year after year
  – Relied on pesticides, fertilizers, and large equipment to support large growing areas
    • Benefits: __________________________________________________________________
    • Problems:
      • __________________________________________________________________
      • Pest species enabled to reproduce on a vast scale
      • __________________________________________________________________
        • Fertilizers can interfere with food webs and biogeochemical cycles

Ecological Footprint

• Ecological Footprint –
  – ___________________________________________________________
  – The land must produce and maintain enough
    ___________________________________________________________
    ___________________________________________________________
  – Size of ecological footprint depends on several factors
Factors that affect Ecological Footprint

- 
- 

Pollutants accumulate in the air

- What is pollution?
  - Describes any ________________________________, that is added to the air, water, or soil
  - Examples of pollutants:
    - ________________________________
    - ________________________________
  - Pollution can be immediate or delayed over time

Air Pollution

- Most common air pollution comes from the waste products produced by ________________________________ such as gas and oil
- ________________________________ is one type of air pollution.
- ________________________________ is the second component of smog
- Plays ________________________________ in Earth's upper atmosphere
  - Shields against harmful UV light from sun

Air Pollution

- Smog can be harmful to human health.
  - ________________________________ is caused by fossil fuel emissions.
    - produced when pollutants in the water cycle cause rain
    - ________________________________
    - can lower the pH of a lake or stream
    - can harm trees

Air Quality

- Air pollution is changing Earth's biosphere.
- The levels of atmospheric carbon dioxide rise and fall over time.
  - ________________________________ are typical of Earth's warmer periods.
- The greenhouse effect ________________________________ from the Earth's atmosphere.
  - sunlight ________________________________ Earth's atmosphere
  - energy is ________________________________ as heat
  - greenhouse gases absorb ________________________________
  - greenhouse gas molecules ________________________________
Global Warming

• Global warming refers to the trend of

• Over the past 100 years, the average global temperature has risen __________________________ degrees Celsius
• What is causing the rise in temperature change known as global warming?
  • Result of __________________________ such as carbon dioxide, water, and methane
  • Results for

Chapter 16
Human Impact on Ecosystems
Day Two

Water Pollution

• Water pollution __________________________ ecosystems.
• Pollution major impact on ecosystems
  – Examples:
    • __________________________
    • __________________________
    • __________________________
• Degrades aquatic habitats in streams, lakes, and oceans
• __________________________ get into streams and cause algal blooms
• Coral reefs are destroyed when silt covers the living coral and they can’t photosynthesize or get to food
• __________________________ in runoff cause sickness and death in aquatic organisms
• Abandoned drift nets trap dolphins, whales, fish, sea turtles

Indicator Species

• Way in which scientists can determine the__________________________ of an ecosystem
• Also known as a __________________________
• Defined as a species that provides a __________________________, of the quality of the ecosystem’s environmental conditions
  – Examples: __________________________ – skin comes into contact with water; pollution can cause tumors
Biomagnification

- Causes ________________________________________________________ in the food chain
- Defined as a ________________________________________________________ as predators eat prey accumulating in higher concentrations in the bodies of predators

- Pollution is measured in ____________________________________________
- Most serious effect on species near the ________________________________

Biodiversity

- Why is biodiversity important?
  - _______________________________________________________________ of the genetically based variety of all organisms in the biosphere
  - Reason 1: It is the ___________________________________________ of much of our world
  - Reason 2: Many ______________________________________________ come from nature
  - Reason 3: __________________________________________________ has long term effects. When it is gone, it is gone forever!
    - It ___________________________________________________________ and makes it more difficult for the ecosystem to handle future change

Threats to Biodiversity

- Loss of habitat can eliminate a species
- Habitat Fragmentation
  - Occurs when a ____________________________________________ forms that prevents an organism from accessing its entire home range
  - ____________________________
  - Caused by the ________________________________________________ or the harvesting of forests

Threats to Biodiversity

- ______________________________________________________ can disrupt stable relationships in an ecosystem
- Defined as any organism that was brought to an ecosystem as the result of____________________________________
  - Also called an________________________________________________
- Can ______________________________________________________ out native species
<table>
<thead>
<tr>
<th>Species</th>
<th>Where Introduced</th>
<th>Problems Caused</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Florida Everglades (originally from SE Asia)</td>
<td>Feeds on small animals such as rats, birds (endangered), raccoons, and even dogs</td>
</tr>
<tr>
<td></td>
<td>SE United States (also from SE Asia)</td>
<td>Chokes out native plants</td>
</tr>
<tr>
<td></td>
<td>Australia (originally from Europe)</td>
<td>Eat crops of corn and grains; Populations grow exponentially</td>
</tr>
</tbody>
</table>

**Conserving Biodiversity**
- Today, conservation efforts focus on protecting entire ecosystems as well as single species
  - Most often, the need to protect biodiversity is greatest in countries that are least able to do so. These are known as ____________________________
    - Example: rainforests are found in developing countries

**Sustainable Development**
- ____________________________ for present and future generations
- Defined as the practice in which natural resources are ____________________________ in a way that meets current needs without hurting future generations

**Practices in Fishing Industry**
- ____________________________
  - Rotate between fish species
  - ____________________________
    - Gear can damage the sea floor
  - ____________________________
    - Slowing the harvest allows more growth time
  - ____________________________

**Umbrella Species**
- Conservation practices ____________________________ but benefit entire ecosystems
- Defined as species whose being protected under the ____________________________ leads to the preservation of its habitat and all of the other organisms in its community

**Important Environmental Laws**
- ____________________________
• Signed into law in 1970, helped increase air quality; regulates emissions from factories and automobiles
• ________________________________________________ –
• Signed into law in 1972, provides safe waterways for swimming and drinking
• ________________________________________________ –
• Signed into law in 1973, provides safety for animals in danger of becoming extinct

Human Can Protect the Environment
• ____________________________________________________ by controlling birth rates
• ____________________________________________________ to produce more food and produce less waste
• Take action to ______________________________________________ ecosystems