Chapter 5: Populations

Section 5-1: How Populations Grow

Characteristics of Populations

1. Geographic distribution (range)

2. Density
   - Population Density: the number of individuals per unit area

3. Growth rate
   Three factors that affect population size:
   - Number of births
   - Number of deaths
   - Number of individuals that enter or leave the population
     - Immigration: movement of individuals into an area
     - Emigration: movement of individuals out of an area

Exponential growth
- Individuals in a population reproduce at a constant rate
- Under ideal conditions with unlimited resources
- J-shaped curve

Logistic growth
- A population’s growth slows or stops following a period of exponential growth
- As resources become less available
- S-shaped curve

Carrying capacity: the largest number of individuals that a given environment can support
Section 5-2: Limits to Growth

Limiting Factor
  ▪ Factor that causes population growth to decrease

  ▪ **Density-Dependent Limiting Factors**
    o A limiting factor that depends on population size
    o Become limiting only when the population density reaches a certain level
    o Operate most strongly when a population is large and dense
    o **Competition**
      ▪ The more individuals living in an area, the sooner they use up the available resources
    o **Predation**
      ▪ Predator—prey relationship \(\rightarrow\) population control
    o **Parasitism and Disease**
      ▪ Parasites take nourishment at the expense of their hosts, usually causing disease or death

  ▪ **Density-Independent Limiting Factors**
    o Affect all populations, regardless of the population size
    o Crash in population size
    o **Examples**
      ▪ Unusual weather
      ▪ Natural disasters
      ▪ Seasonal cycles
      ▪ Human activities (damming rivers, clearcutting forests)
Section 5-3: Human Population Growth

Historical Overview
- The size of the human population tends to increase with time
- For most of human existence, population grew slowly
- About 500 years ago began growing more rapidly
  - Agriculture & industry made life easier & safer
  - More reliable food supply
  - Goods could be shipped around the world
  - Improved sanitation, medicine, & health care reduced death rate & increased longevity

Patterns of Population Growth
- Demography: the scientific study of human populations
- Birthrates, death rates, & the age structure of a population help predict why some countries have high growth rates while other countries grow more slowly
- The Demographic Transition
  - Population growth in the U.S., Japan & much of Europe has slowed dramatically
  - These countries have completed the demographic transition (a dramatic change in birth & death rates)
  - Advances in nutrition, sanitation & medicine, more children survive to adulthood & more adults live to old age
  - This lowers the death rate & begins the demographic transition
  - As societies modernize, increase levels of education, & raise their standard of living, families have fewer children
  - Birthrate falls & population growth slows

Future Population Growth
- Current predictions estimate that by 2050 the world population may be more than 9 billion
- Growth rate projected to be 0.43 percent
- Could lead to serious damage to the environment as well as the global economy