Population density – the number of individuals per unit area

Immigration – the movement of individuals into an area causing a population to grow

Emigration – the movement of individuals out of an area causing a population to shrink

Exponential growth – population growth that occurs when individuals reproduce at a constant rate. Under ideal conditions with unlimited resources, this is the growth that would occur indefinitely.

Logistic growth – After exponential growth, as resources become less available, the population growth rate slows or stops. This usually creates an S shaped population curve

Carrying capacity – the largest number of individuals that a given environment can support

Characteristics of Populations
- Geographic distribution – the area inhabited by a population (range)
- Density – the number of individuals per unit area
- Growth rate

Three factors that can affect population size
- Number of births
- Number of deaths
- Number of individuals that enter or leave a population

Factors that can cause immigration and emigration
- Young animals reach maturity and must find another territory or mates
- Shortage of food
- Changes in habitat

Limiting factor – a factor that causes population growth to decrease.

Density-dependent limiting factor – a factor that only becomes limiting when the population density reaches a certain level. These are usually a factor when a population is large and dense.
Some density-dependent limiting factors:
- Competition
- Predation
- Parasitism
- Disease

Competition – crowded populations compete for food, light, water, space, etc.

Predator-prey relationship - interactions between predators and prey that cause both populations to experience cycles of population growth and population shrinkage.

The increase in prey cause a prey population spike.
The prey increase creates an increase in food supply.
The predator eats more and reproduces more.
There is an increase in predator population.
The increased number of predators eat much more prey.
The prey population decreases, decreasing the food supply.
The predators starve or become unhealthy, reproducing less.
The decrease in predators allows the prey population to increase.
Start over.

Density-independent limiting factor – factors that affect all populations in similar ways, regardless of the population size.
- Unusual weather
- Damming rivers
- Clear cutting forests
- Fires and other natural disasters

Demography – scientific study of human populations

Demographic transition – a dramatic change in birth and death rate

Age-structure diagram – a diagram used to predict future growth using populations profiles, which graph the numbers of people in different age groups in the population.

Human population grew slowly due to limiting factors like scarce food and incurable diseases. The Industrial Revolution made agriculture and industry safer, medical advanced and health care improve, and sanitation were much better. The result was the human population experiencing exponential growth.

Thomas Malthus – English Economist who first predicted that the human exponential growth could not continue but would be limited due to war, famine, and disease. His work greatly influenced Charles Darwin.

Factors that predict the growth rate of a country: birthrate, death rate, and age structure
Pattern of Demographic transition:

1. Birth rate is high and death rate is equally high (most of human history)
2. Death rate starts to fall but birth rate remains high (population increases rapidly) and this is the start of the demographic transition.