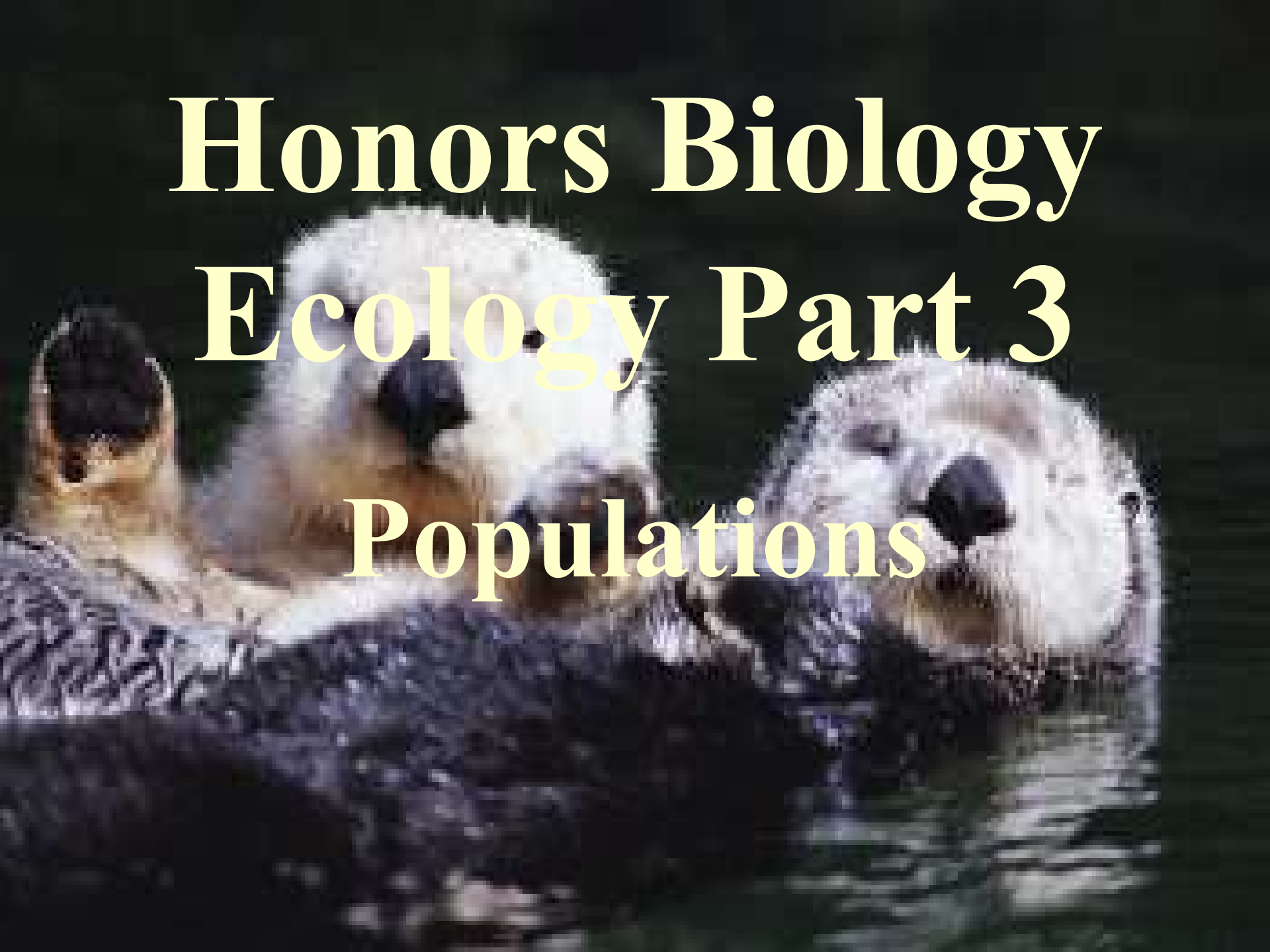
Honors Biology
Ecology Part 3

Populations

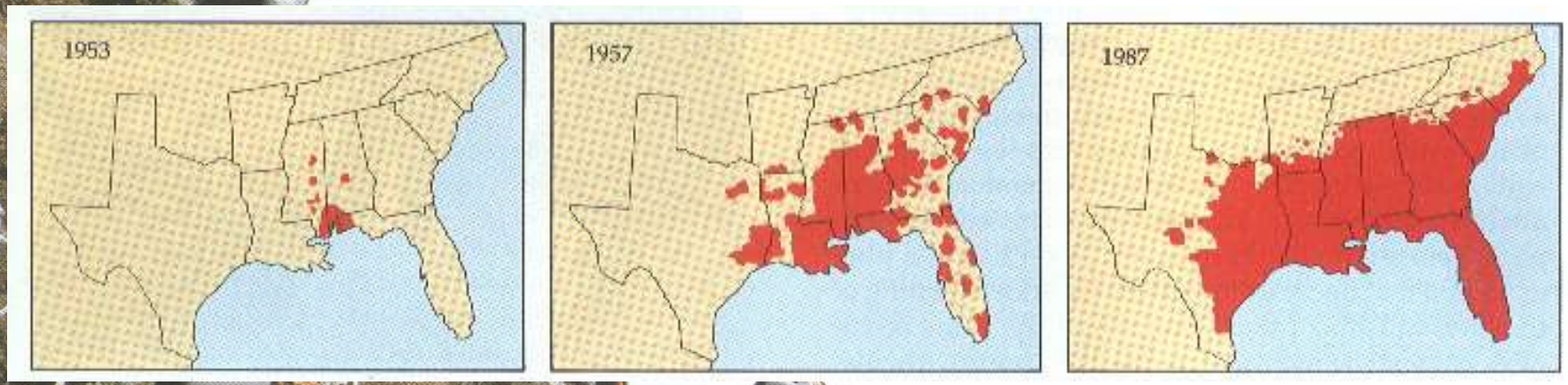


VII. Populations

A. Characteristics of Populations

1. **Geographic distribution (range)-** area inhabited by population

2. **Population density-** number of individuals per unit area



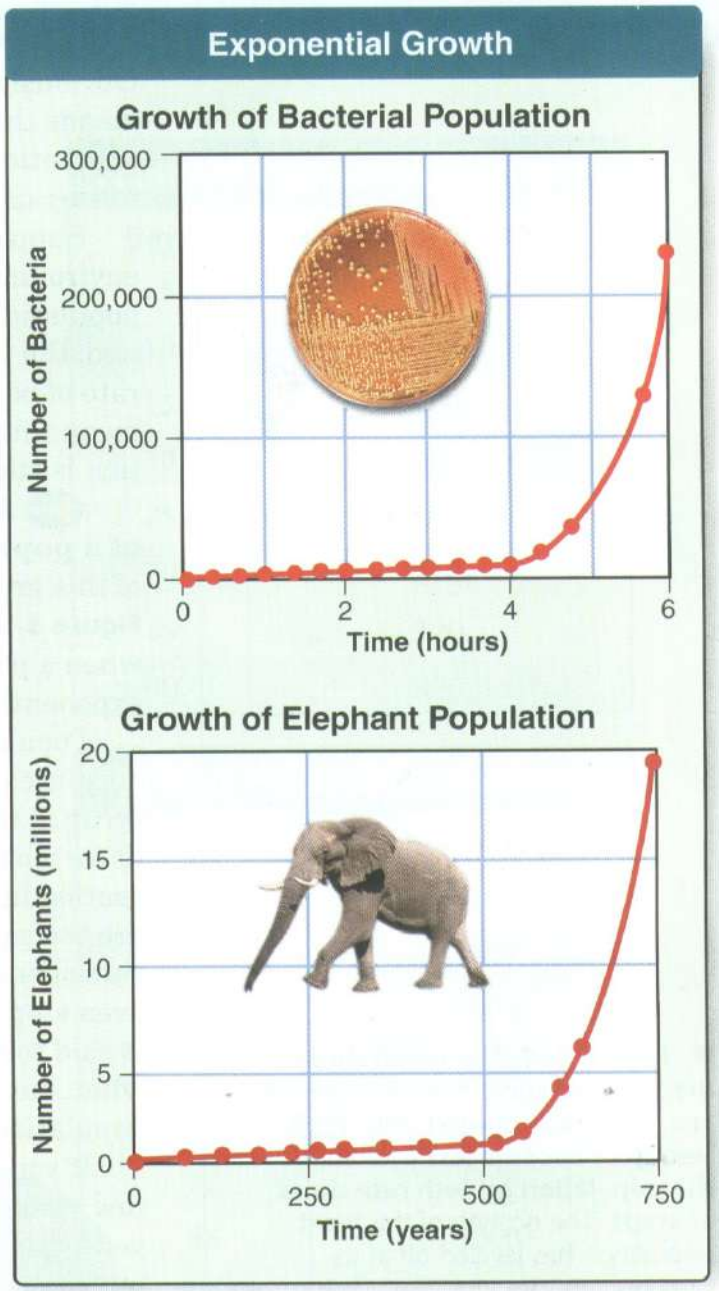
3. Growth Rate- size of population depends on number added or removed from it. Affected by 4 factors

a. Number of **births**

b. Number of **deaths**

c. Amount of **immigration**- movement of individuals into area occupied by existing population

d. Amount of **emigration**- movement out of a population



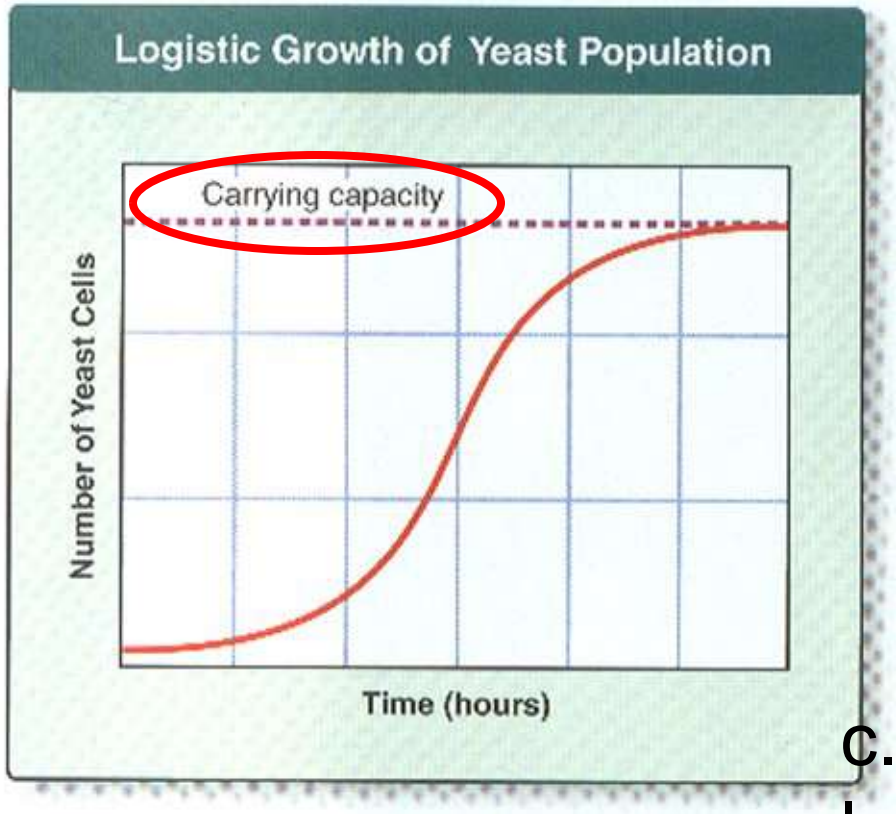
3. Exponential growth- under ideal conditions with unlimited ressources, population will grow exponentially

a. Populations reproduce at a constant rate

b. Produces "**J-shaped**" curve

Exponential growth will not continue for long. (lack of food, etc.)

4. Logistic growth- as resources are used up, population growth slows or stops after period of exponential growth



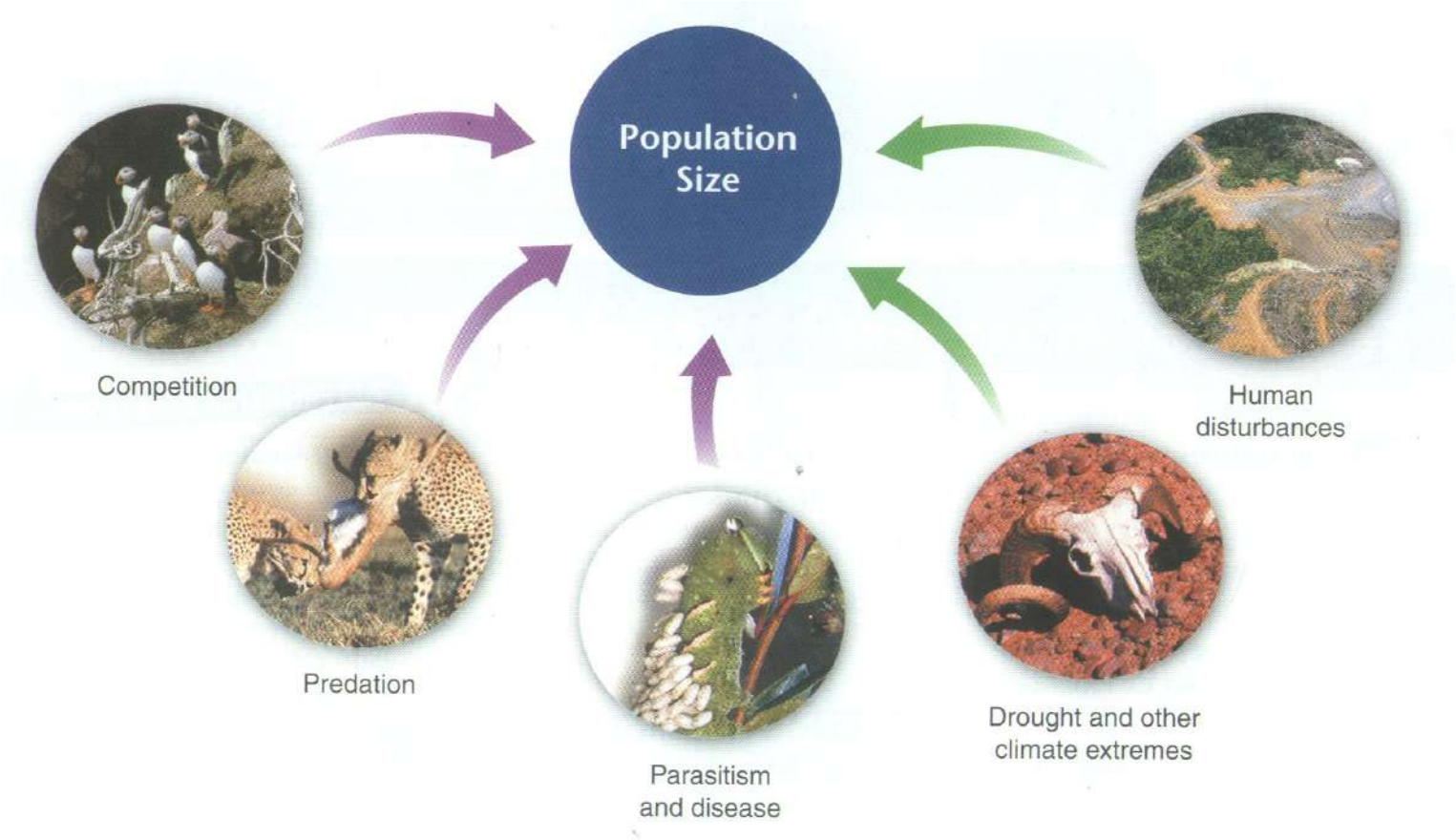
a. Produces "**S-shaped**" ırve

Many factors affect slow ɔwn; birth rate decreases, crease in death rate, ecrease in immigration, crease in emigration

c. **Carrying capacity**- largest number of individuals a given environment can support

B. Limits to Growth

1. **Limiting factors**- *factors that can cause population growth rate to decrease*

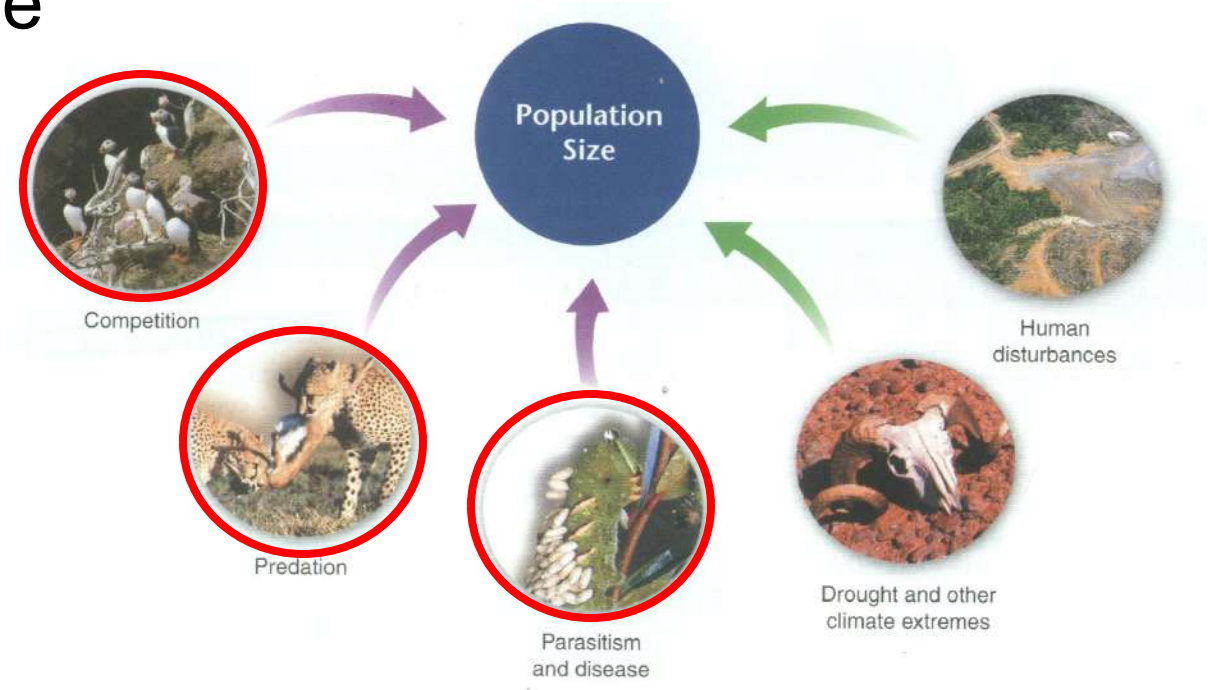


a. Density-dependant factors- limiting factors that depends on population size

1). Happens only when population density reaches certain level

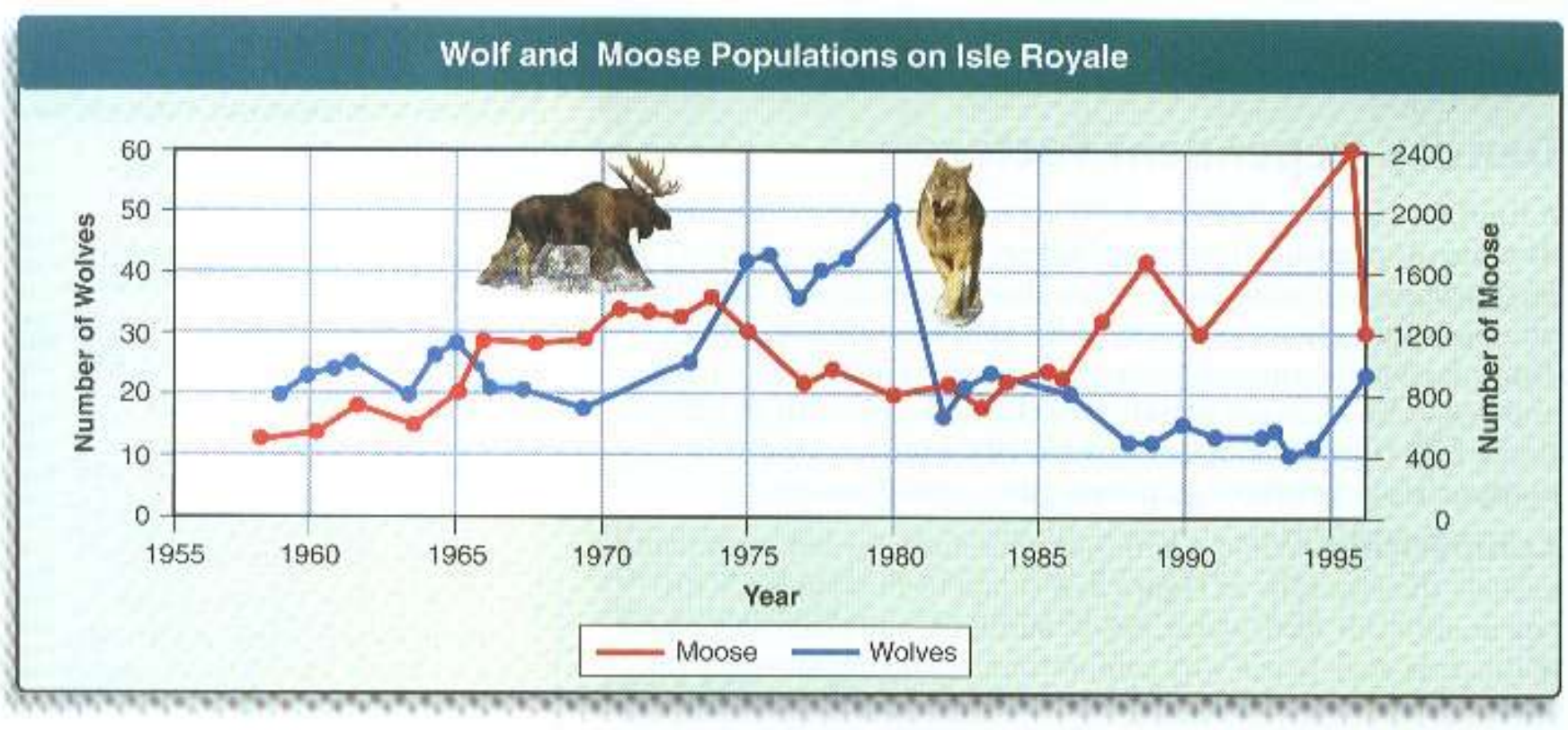
2). Affects large populations more

3). Includes competition, predation, parasitism, and disease

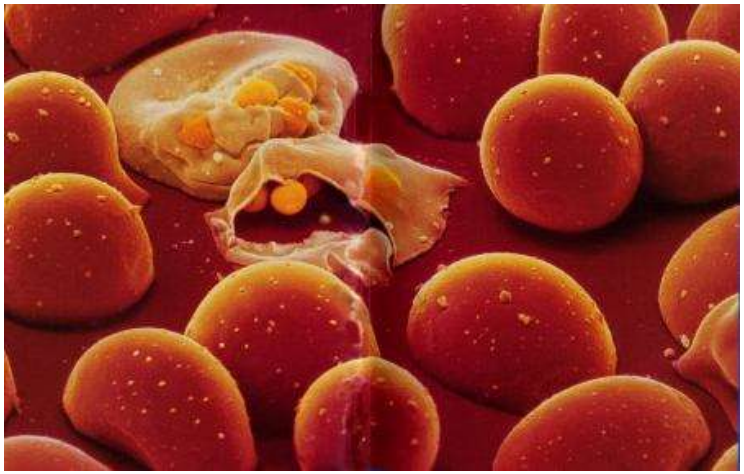


a). Competition- ***when population becomes crowded, organisms compete for food, water, space, sunlight, and other essentials of life***

a). Predation *(predator-prey relationship)- one of best known mechanisms of population control*



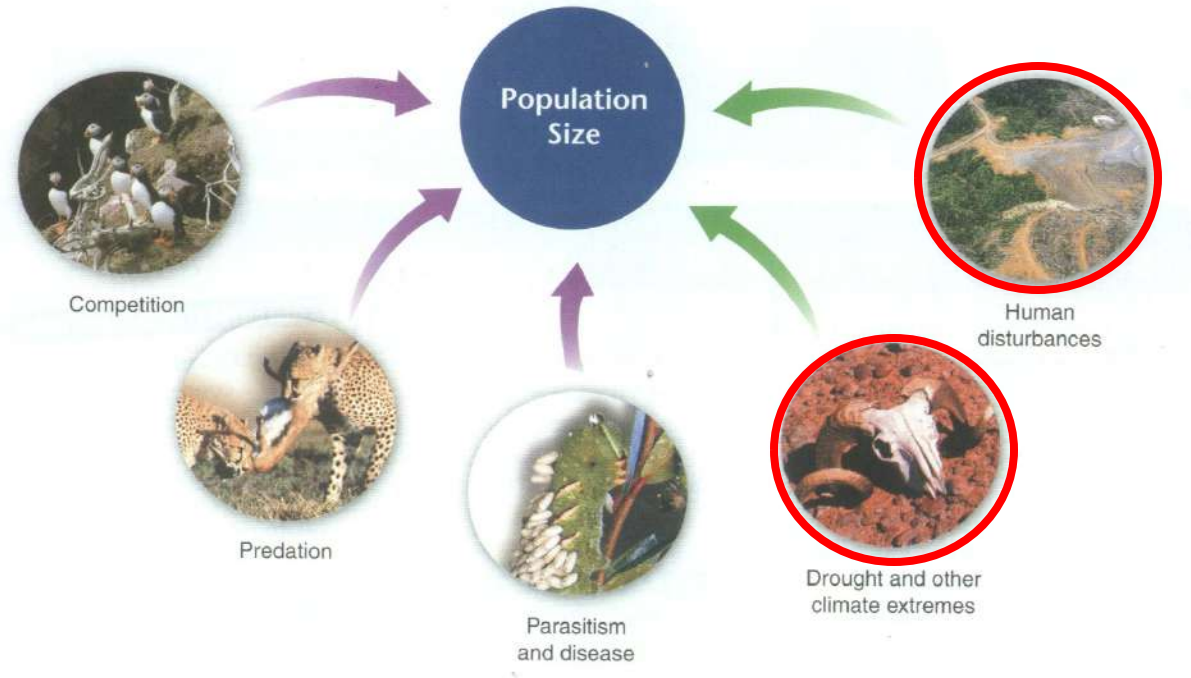
a). Parasitism- ***feed at expense of host, weakening them and causing disease or death***



a. Density-independant factors- affect all populations regardless of population size

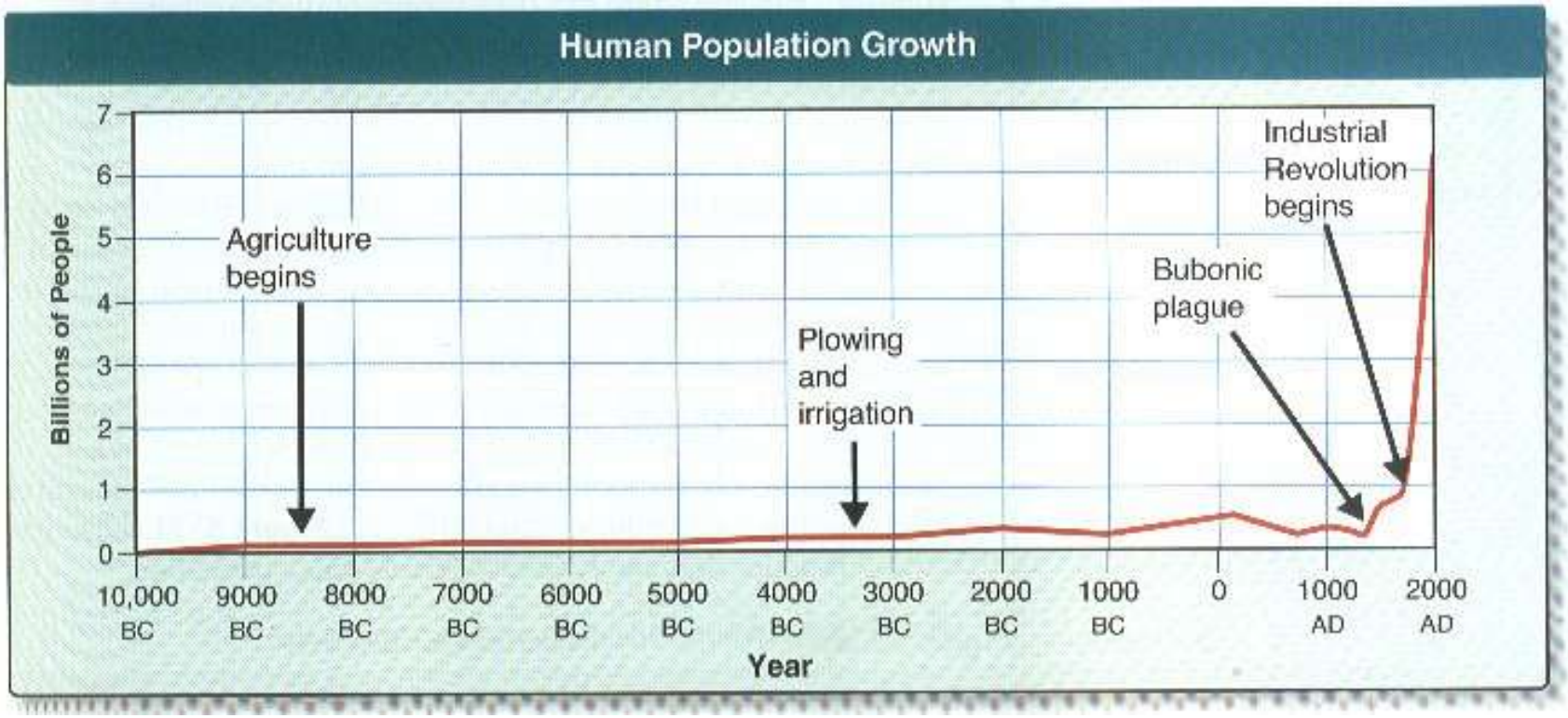
1). Includes unusual weather, natural disasters, seasonal cycles certain human activities

2). Human activities have caused some long-term declines in populations



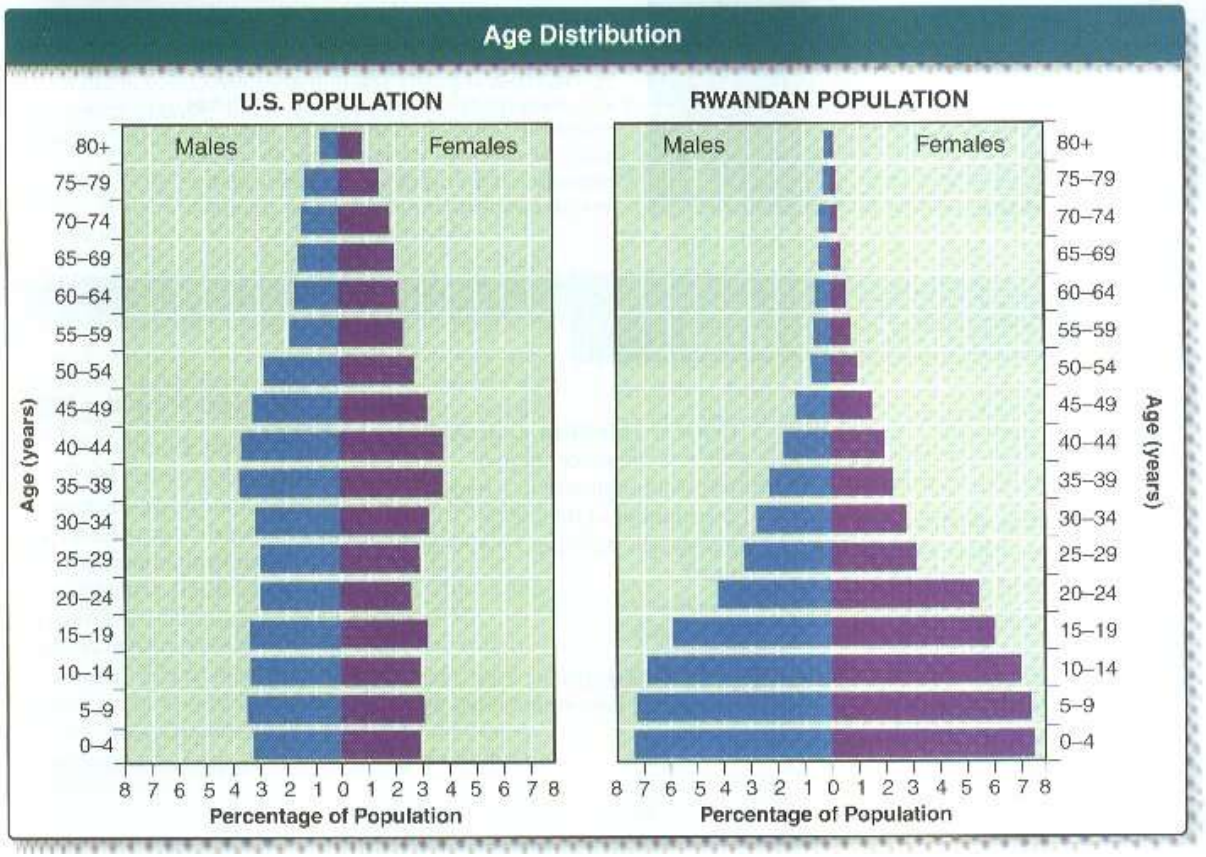
C. Human Population Growth

1). Historical overview- human population has increased over time. Long, slow start with exponential growth after improvements in medicine, sanitation, agriculture, energy use, and technology

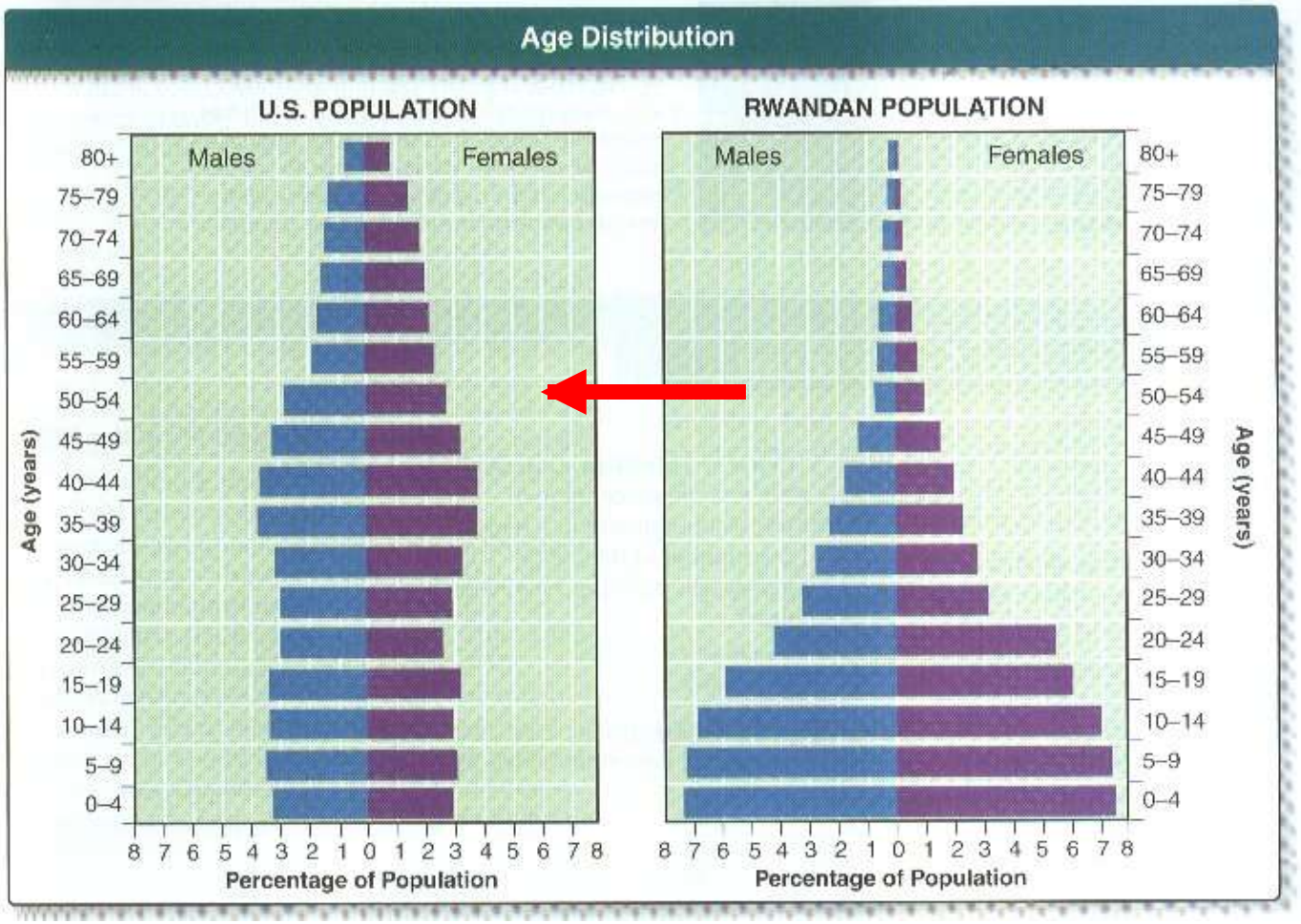


2. Limits to human population growth- cannot increase exponentially forever.

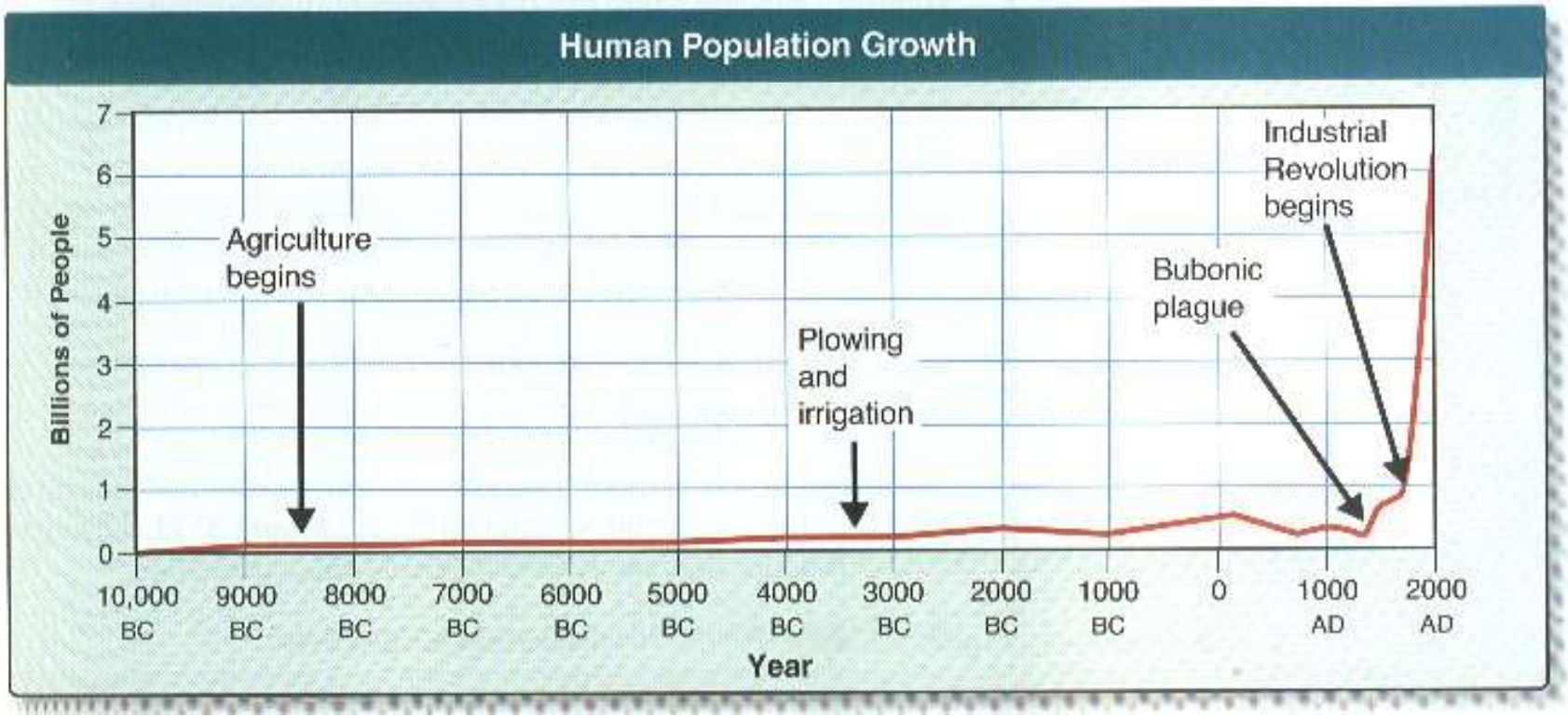
a). **Demography**- study of growth rates, density, age-structure of a population to predict how its size will change



b. Demographic transition- tendency of population to shift from high birth rate and death rates to low birth and death rates. Result = slow or no increase



3. Future Human Population Growth- will grow. Project 7.8 billion by 2025, 9 billion by 2050. May slow or level off by that time…….



Review

Chapter 5
Populations

Which of the following is NOT one of the four factors that play a role in growth rate?

a.immigration

b.death rate

c.emigration

d.demography

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One of the main characteristics of a population is its

a.change over time.

b.geographic distribution.

c.dynamics.

d.habitat.

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Sea otters are important to the populations of

a.kelp.

b.sea urchins.

c.killer whales.

d.all of the above

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There are 150 Saguaro cacti plants per square kilometer in a certain area of Arizona desert. To which population characteristic does this information refer?

a.growth rate

b.geographic distribution

c.age structure

d.population density

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Which of the following tells you population density?

a.the number of births per year

b.the number of frogs in a pond

c.the number of deaths per year

d.the number of bacteria per square millimeter

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When organisms move into a given area from another area, what is taking place?

a.immigration

b.emigration

c.population shift

d.carrying capacity

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When organisms move out of the population they were born in, it is known as

a.emigration.

b.abandonment.

c.immigration.

d.succession.

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What occurs in a population as it grows?

a.The birthrate becomes higher than the death rate.

b.The birthrate stays the same and the death rate increases.

c.The birthrate becomes lower than the death rate.

d.The birthrate and the death rate remain the same.

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What is happening in a population as it decreases?

a.The birthrate and the death rate remain the same.

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c.The death rate stays the same and the birthrate increases.

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If immigration and emigration numbers remain equal, which is the most important contributing factor to a slowed growth rate?

a.increased birthrate

b.constant death rate

c.decreased birthrate

d.constant birthrate

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Which are two ways a population can decrease in size?

a.immigration and emigration

b.increased death rate and immigration

c.decreased birthrate and emigration

d.emigration and increased birthrate

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When individuals in a population reproduce at a constant rate, it is called

a.logistic growth.

b.growth density.

c.exponential growth.

d.multiple growth.

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The various growth phases through which most populations go are represented on a(an)

a.logistic growth curve.

b.exponential growth curve.

c.normal curve.

d.population curve.

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Which of the following describes how fast the human population is growing?

a.slowly

b.The population is remaining stable.

c.exponentially

d.The population is decreasing.

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When the exponential phase of a logistic growth curve of a population ceases,

a.the size of the population drops.

b.the size of the population stays the same.

c.population growth begins to slow down.

d.population growth begins to speed up.

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A biotic or an abiotic resource in the environment that limits the size of a population is a

a.carrying capacity.

b.limiting nutrient.

c.limiting factor.

d.growth factor.

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The number of organisms that an environment can support over a relatively long period of time is called

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