

PROPERTY OF:

BIOLOGY – UNIT 5 – CHAPTER 5 NOTES

POPULATIONS & COMMUNITIES

Dispersion

Dispersion = a pattern of how organisms are located

EX. 1: CLUMPED = the organisms are found in distinct areas or patches

EX. 2: UNIFORM = the organisms are evenly spread out throughout an area

EX. 3: RANDOM = there is no pattern to how the organisms are found

EX. 4: GRADIENT = most of the organisms are located near something;
there are fewer and fewer organisms as you move farther away

Population Growth

- Most populations grow according to 3 distinct phases:

1. slow period of growth at the beginning
2. intense (fast) period of growth
3. growth slows down and the population size evens out (carrying capacity)

- The population growth curve is also called an “S-shaped curve” or an “S-curve”.

Carrying Capacity

- carrying capacity = the maximum number of organisms an environment can support

- Carrying capacity is determined by the various limiting factors.

- Carrying capacity occurs when the birth rate equals the death rate.

- EXPONENTIAL GROWTH = phases 1 and 2
referred to as “R-selected”
population has not reached carrying capacity yet
the birth rate is greater than the death rate

- LOGISTIC GROWTH = phase 3
referred to as “K-selected”
population has reached carrying capacity
the birth rate and the death rate are equal

Limiting Factors

- limiting factors = factors that limit population size
- Limiting factors prevent the population of a species from increasing beyond what the environment can support.
- 2 types of limiting factors: biotic factors and abiotic factors

Biotic Limiting Factors

- any factor that is affected by the # of organisms in the population
- also called density-dependent factors; determined by the density of the population
- referred to as living factors

EX: competition = fighting for food, shelter, water, mates, territory, light, etc.

EX: predation = when one animal eats another; predator-prey; food chain

EX: parasitism = when an organism feeds off of a host; diseases

EX: crowding = not enough space for all the organisms

Abiotic Limiting Factors

- any factor that is NOT affect by the # of organisms in the population
- also called density-independent factors; not determined by the density of the population
- referred to as non-living factors

EX: drought, tornado, earthquake, tsunami, volcano, hurricane, cold weather, forest fire, etc.
anything that is not caused by the # of organisms

R-Selected Species

exponential growth
early age of reproduction
reproduce often
many offspring at a time
smaller offspring
short generation time
little parental care
pioneer species
has not reached carrying capacity

K-Selected Species

logistic growth
later age of reproduction
reproduce infrequently
few offspring at a time
larger offspring
long generation time
lots of parental care
climax community
has reached carrying capacity

PROPERTY OF:

BIOLOGY – UNIT 5 – CHAPTER 6 NOTES

HUMANS IN THE BIOSPHERE

Air Pollution

1. SMOG
Cause: smoke and fog; smoke produced by factories
Effect: dark, cloudy skies – especially near big cities (EX: Los Angeles)
2. ACID RAIN
Cause: sulfur gases released by the burning of fossil fuels (EX: gas, oil, coal, etc.)
The sulfur gases combine with H₂O to form sulfuric acid in the atmosphere.
Effect: plant roots are not able to absorb nutrients
plants die, creating a major problem for the food chain
3. GLOBAL WARMING
Cause: carbon dioxide released by the burning of fossil fuels
Effect: the extra carbon dioxide in the atmosphere contributes to the greenhouse effect
extra heat is trapped in the atmosphere → ice caps melt → sea levels rise
4. OZONE DEPLETION
Cause: chlorofluorocarbons (CFC's) found in aerosol cans and other household items
Effect: CFC's destroy the ozone layer, which is used to absorb the sun's UV radiation
Increased rate of skin cancer

Water Pollution

1. Chemical Contamination = chemicals are dumped into the water
2. Sewage Contamination = human waste is dumped into the water
3. Thermal Pollution = factories dump hot water into the water
4. Ocean Pollution = garbage and other trash are dumped into the water
5. Oil Spills = when oil is accidentally dumped into the water (EX: Gulf Coast - 2010)

Biological Magnification

- when a toxic, fat-soluble chemical accumulates in the soil, it makes its way up the food chain, becoming more concentrated (higher amounts) at each increasing trophic level
- Fat-soluble toxins cannot be excreted through the urine, so they remain in the fat tissue.
- Unlike the 10% rule, fat-soluble toxins increase in concentration at each trophic level.
- EX: DDT (dichlorodiphenyltrichloroethane), a banned pesticide

Human Population Growth

- The human population has grown so rapidly in the past couple of hundred years.
- We have not reached carrying capacity yet.
- We are still experiencing exponential growth.
- Eventually we will run out of resources (limiting factors), and the population will stabilize.