Ecology Test – Study Outline

1. Levels of Ecological Study:
2. Know difference between Populations, Community, Ecosystems
   1. Biotic vs. abiotic factors
3. Know direction of Energy Flow between organisms
   1. Producers🡪primary consumers🡪secondary consumers🡪tertiary consumers
   2. Autotrophs vs. heterotrophs
   3. Herbivore vs. carnivore vs. omnivore vs. decomposer
   4. Only 10% of energy is transferred at each trophic level
4. Analyze the cycling of matter and nutrients within an ecosystem
5. Water cycle : Condensation, Transpiration, Precipitation, Evaporation, Run-Off
6. Carbon Cycle: photosynthesis, respiration, decomposition, combustion of fossil fuels
   1. Know that Carbon Dioxide is the carbon compound being transferred between biotic and abiotic parts of an ecosystem
   2. Know that photosynthesis pulls CO2 out of atmosphere and used to synthesize carbohydrates (glucose) in plants AND that all organisms return CO2 to atmosphere through cellular respiration and death and decomposition
   3. Know that humans also put CO2 in atmosphere when they burn (combust) fossil fuels such as oil, wood, coal
7. Nitrogen Cycle: know that all organisms need nitrogen to synthesize amino acids (proteins) and DNA/RNA.
   1. Atmospheric nitrogen must be converted to ammonia (or ammonium) before it is useful for organisms
   2. Lightning and bacteria living in root nodules of plants can convert atmospheric nitrogen to ammonium
   3. Death and decomposition return nitrogen to atmosphere
8. Community Interactions
9. Know relationships between organisms:
   1. Predation, Competition
   2. Symbiotic relationships: Mutualism and Parasitism
10. Population Ecology
11. Limiting Factors restrict how large populations can get
    1. Density Dependent vs. Density Independent Limiting factors
    2. Be sure to know several examples of limiting factors
       1. Diseases such as AIDS, Influenza, Tuberculosis, Dutch Elm Disease, Pfisteria
       2. Predation, competition, food and space availability, mates
       3. Climate and weather: drought, floods, earthquakes, fire
12. Graphs of population growth:
    1. Exponential vs. Logistic (J curve vs. S curve)
    2. Carrying Capacity
    3. Human population (age structure diagrams)
13. Human Impact on Environment
14. Greenhouse Effect and Global Warming
    1. Fossil fuel, habitat destruction
15. Acid rain
16. Ozone Depletion
17. Invasive species
18. North Carolina specific Issues
    1. Hog waste lagoons, Acid rain in mountains, beach erosion, urban development, Kudzu as invasive species