

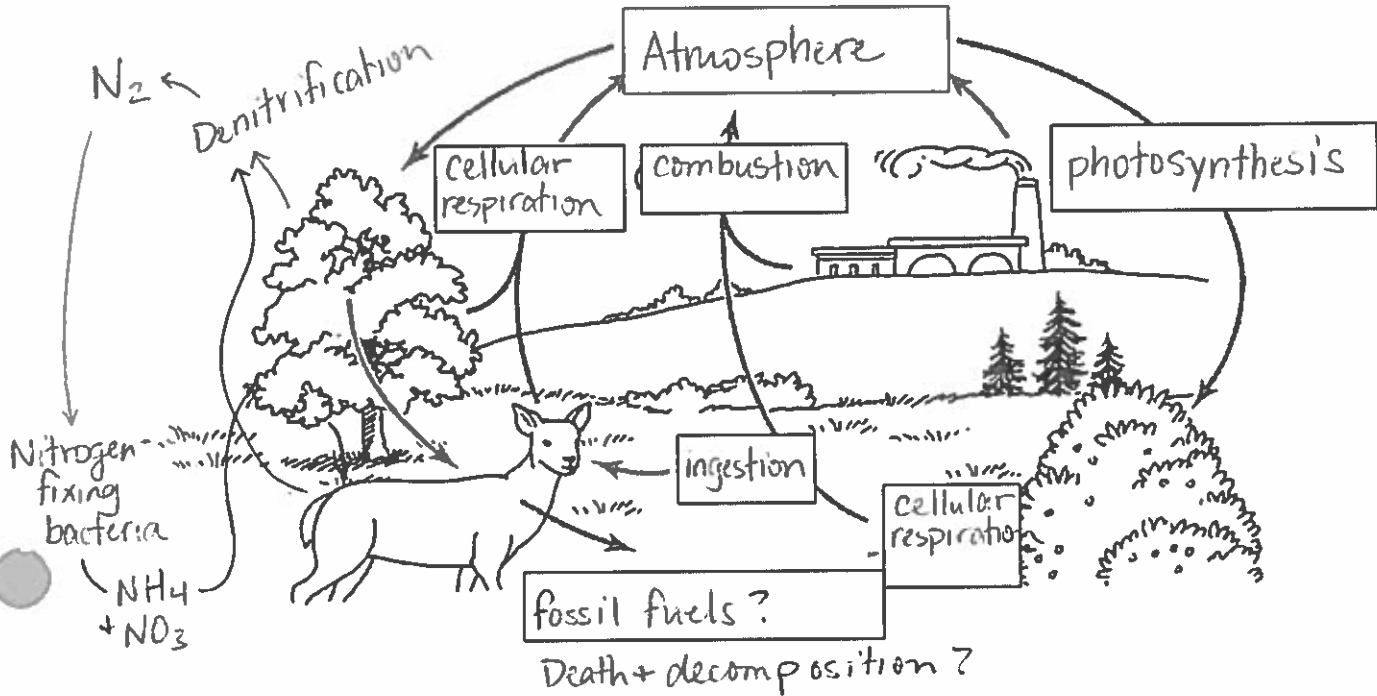
Ecology, Populations and Ecosystems, Cycles, and Evolution/EOC Review

Transfers and Cycles of Matter & Energy

1. Fill in the blanks in this Carbon Cycle using the following terms:

atmosphere	cellular respiration	combustion	photosynthesis
death and decomposition	ingestion of food	fossil fuels	

The Carbon Cycle



2. Use the word bank below to fill in the blanks. Some words may be used more than once.

glucose	CO ₂	solar	chemical	cellular respiration	decomposition	ATP
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During photosynthesis, atmospheric carbon in the form of CO₂ undergoes a chemical reaction and is now glucose. This process transforms solar energy into chemical energy. The processes of decomposition and cellular respiration both release CO₂ back into the atmosphere from the biomolecule glucose. This process also transforms chemical energy into ATP, or chemical energy.

3. In the atmosphere, nitrogen atoms are/are not (circle one) useful to plants. Explain your answer.

N₂ gas must be "fixed" by bacteria so it's in a form plants can use.

4. Using a colored pencil add onto the above Carbon Cycle picture the following parts of the Nitrogen Cycle:

Nitrogen fixation	Bacteria	Assimilation	Denitrification
N ₂	NH ₄	NO ₃	

Population Density, Limiting Factors, Population Graphs

5. Use the words in the bank below to fill in the blanks. You may use some words multiples times or not at all.

resources	logistic	predation	increase
decrease	competitors	exponential	

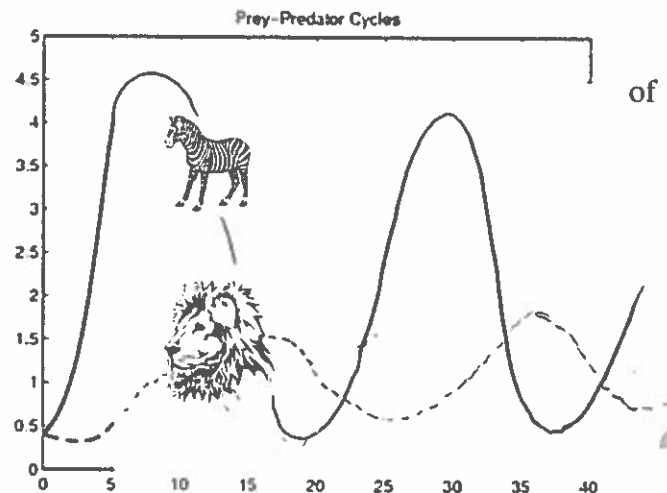
In a healthy ecosystem, populations would grow at a/an exponential rate when they have adequate resources and no predation. Once the population reaches a limit, it would experience logistic growth. Two such factors that would limit growth include competitors or predation. An increase in lions would lead to a/an decrease in zebras and a/an increase in grass. Alternatively, an increase in disease that infects lions would lead to a/an decrease in lions, a/an increase in zebras and a/an decrease in grass. Since lions and hyenas both eat zebras, they are considered competitors. In this case, an increase in hyenas could lead to a/an decrease in lions.

6. In the space below, draw a simple food web showing the flow of energy and matter through the African Savannah ecosystem that has the following organisms: Grass, zebra, lions, hyenas.



7. If decomposers were not in the food web in question #6, the carbon and nitrogen (hint, two important atoms) in the biomolecules may never return to the atmosphere to be cycled again into and out of living organisms.

8. The graph to the right shows the zebra and lion population for the first 5 years of a scientific study. Complete the graph with your prediction for the sizes the two populations for the next 35 years. Neither population goes extinct.

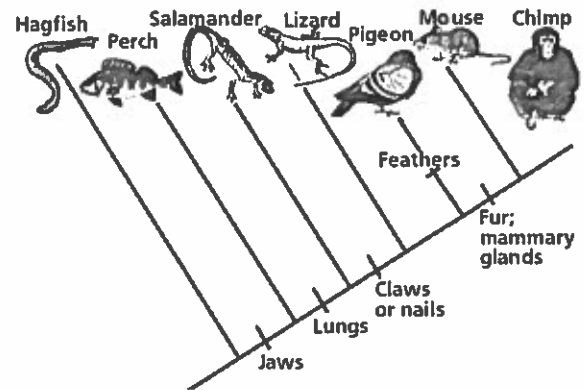


Evolution by Natural Selection

alleles	common ancestor	differential survival and reproduction	genetic variation
struggle for existence	anatomical	mutation	trait
reproduce	embryology	overproduction of offspring	survive gradual

9. Random changes, occasional mistakes, substitutions, or deletions in the copying of DNA are called mutations and create new alleles. These changes can be inherited by future generations and result in a new traits. If this trait is beneficial, it can allow the offspring to better survive and reproduce - these are two factors that could result in a new species.

10. The cladogram/evolutionary tree to the right shows that hagfish are a common ancestor to all other animals.



11. The two animals that would have the most similarities in DNA, anatomical similarities, and embryos would be mice and chimps

(not in word bank).

12. Evidence from embryology shows the similarity in unborn, developing embryos.

13. Anatomical evidence compares homologous (same) structures between different organisms and shows a common ancestor.

14. Examining the fossil record for a single species show gradual changes through time.

15. The four factors for evolution by natural selection state that there must be:

Genetic Variation that results in different versions of traits in a population. Overproduction of offspring because not every baby survives to reproduce. Struggle for existence because resources are limiting. This combination allows differential survival + reproduction and for a trait to become more common in the population over time.

