

**Quiz 2: Energy Flow and Nutrient Cycles**  
[25 points]

**Critical Thinking:** [5 points]

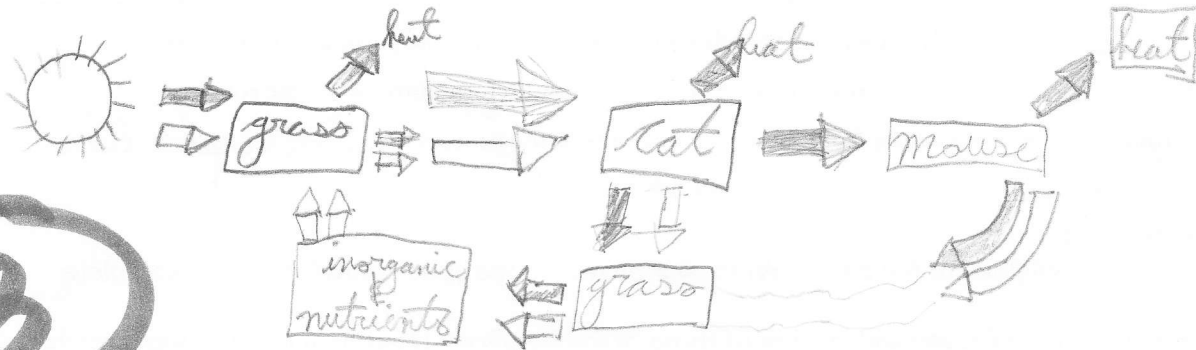
1. Place the organisms below into a food chain. Use a **solid arrow** to indicate the direction of energy flow, and a **dotted arrow** to represent the direction of nutrient flow. Be sure to include the **sun** and the **organic nutrient pool**. Be sure to label the **producers, consumers, and decomposers**.

bacteria

cat

grass

mouse



**Multiple Choice:** [1 point each]

Select the one best answer from among the four possibilities for each item. Circle the letter that corresponds to your answer.

2. **Nutrients** move through an ecosystem in

a) biogeochemical cycles.      c) energy pyramids.  
b) water cycles.      d) ecological pyramids.

3. Which of the following processes does NOT occur in the water cycle?

a) evaporation.      c) condensation.  
b) transpiration.      d) mineralization.

4. **Autotrophs** are organisms that

a) rely on other organisms for their energy and food supply.  
b) consume plant and animal remains and other dead matter.  
c) use energy they take in from the environment to convert inorganic molecules into complex organic molecules.  
d) obtain energy by eating only plants.

5. Which of the following is a **decomposer**?

a)



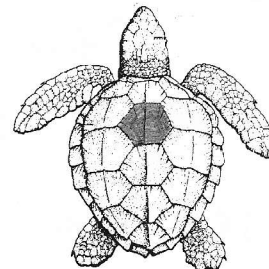
b)



c)



d)



6. Which is a source of energy for Earth's living things?

- a) sunlight
- b) chemical energy
- c) radiation
- d) all of the above.

**Fill in the Blank** [1 point each]

Complete each sentence with one of the vocabulary terms from the box.

autotrophs  
carbohydrates  
decomposers  
evaporation

heterotrophs  
nutrients  
photosynthesis  
producers

proteins  
transpiration

7. Compounds made up of carbon, hydrogen, and oxygen are referred to as carbohydrates.
8. Evaporation is the process by which water changes from liquid to an atmospheric gas.
9. decomposers break down organic matter and return nutrients to the soil.
10. Water enters the atmosphere by evaporating from the leaves of plants in the process of transpiration.
11. The term heterotrophs is Greek for "other food".

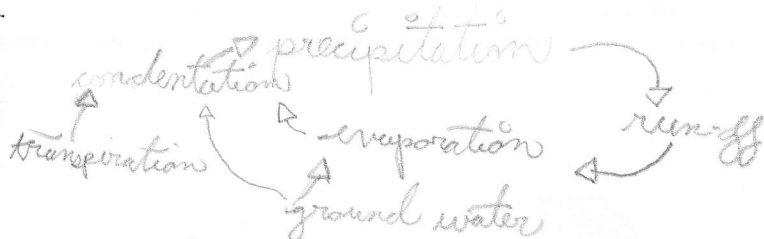
**Short Answer** [5 points each]

Answer both questions to be eligible for full credit. Write your answer in the space provided. Write complete sentences.

12. Compare and contrast the flow of matter and the flow of energy in the biosphere. Describe at least two ways that they are the same, and at least two ways that they are different.

The flow of matter and energy are both within the biosphere, but the difference between flow of matter and energy is that matter is reused and energy is lost.

13. What is meant by the term **biogeochemical cycle**? Sketch and label a complete diagram of the water cycle.



Biogeochemical cycle: elements, chemical compounds and other forms of matter are passed from one organism to another and from one part of the biosphere to another. They connect biological, geological, and chemical aspects of the biosphere.