Name: \_\_**Ms. F’s Answer Key**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_\_

**Energy Flow and Chemical Cycles Test—50 points**

1. What is the difference between **autotrophs** and **consumers**? (2 pts)  
   **Autotrophs can make their own food but consumers must eat other organisms.**
2. Fill in the blanks to describe how energy flows through an ecosystem. Use the following words: (2 pts)  
   decomposers producers the sun consumers  
     
   All energy comes from \_\_\_**the Sun**\_\_\_\_\_\_\_\_\_. Organisms called \_\_\_**producers**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can use the sun’s energy to produce their own food. These organisms are eaten by \_\_\_**consumers**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When organisms die, they are broken down by \_\_\_**decomposers**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, organisms that keep energy cycling in ecosystems.
3. Energy is lost at each trophic level of the food web. How much energy gets transferred from one trophic level to the next? (2 pts)  
   A. 90%  
   B. 50%  
   C. 25%  
   **D. 10%**
4. If the producer level of an energy pyramid contains 1500 calories, then how many calories will be transferred to the primary consumers? (2 pts)  
   A. 2,000 calories  
   **B. 150 calories**  
   C. 15,000 calories  
   D. 1,000 calories
5. Using all of the organisms listed below, and no other organisms, create a food web in the space below. You do not need to draw the organisms. (8 pts)  
   Organisms: mountain lion, oak tree, deer, grass, squirrel, hawk, snake

Mountain Lion

Snake

Hawk

Squirrel

Deer

Oak tree

grass

1. Fill in the chart below using the organisms from your food web. (3 pts)

|  |  |
| --- | --- |
| **Trophic Level** | **Organism(s)** |
| **Producers** | Grass, oak tree |
| Primary Consumers | **Deer, squirrel** |
| Secondary Consumers | **Hawk, snake, mountain lion** |

1. In the food web you just created for #5, which organism would have the **largest** population size? (2 pts)  
   A. Squirrel  
   B. Snake  
   **C. Grass**  
   D. Mountain Lion
2. Explain your choice for Question #7. (2 pts)  
   **There would be much more grass because there is more energy available for organisms at the lower trophic levels than there is for the organisms at higher trophic levels.**
3. Will there be more transpiration in rainforest or a desert? Why? (3 pts)  
   **There will be much more transpiration in a rainforest because transpiration is when water evaporates from plants. There is a lot more rain and there are a lot more plants in the rainforest, so there will be a lot more transpiration.**
4. How are clouds formed? (2 pts)  
   A. Sublimation  
   **B. Condensation**  
   C. Infiltration  
   D. Precipitation
5. Why does there need to be evaporation before there can be condensation? (2 pts)  
   **Condensation occurs when droplets of water vapor come together to form a cloud. Evaporation is the process that produces water vapor, so you need to have evaporation before the water vapor can condense.**
6. When there is a lot of precipitation over the ocean, does the salinity of the water increase or decrease? (2 pts)  
   **Decrease**
7. Which of the following statements is true about nitrogen? (2 pts)  
   A. It only makes up 3% of our atmosphere  
   B. Humans, plants, and other organisms can use the free N2 gas in the atmosphere  
   **C. All organisms need nitrogen to build protein and survive**D. Only plants need nitrogen
8. What is nitrogen fixation? (2 pts)  
   A. Humans breathing in free nitrogen gas  
   B. Bacteria breaking down nitrogen compounds to form free nitrogen gas  
   C. Plants absorbing nitrogen compounds like ammonia and nitrate  
   **D. Bacteria and lighting transforming free nitrogen gas into usable nitrogen compounds**
9. What is denitrification? (2 pts)  
   A. Humans breathing in free nitrogen gas  
   **B. Bacteria breaking down nitrogen compounds to form free nitrogen gas**C. Plants absorbing nitrogen compounds like ammonia and nitrate  
   D. Bacteria and lighting transforming free nitrogen gas into usable nitrogen compounds
10. What do N2, NH3, and NO3 all have in common? (2 pts)  
    **all contain nitrogen**
11. Plants breathe in \_\_\_\_**carbon dioxide**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas. They breathe out \_\_**oxygen**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas. (1 pt)
12. Humans breathe in \_\_\_\_**oxygen**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas. They breathe out \_**carbon dioxide**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas. (1 pt)

**Photosynthesis**6CO2 + 6H2O + light energy 🡪C6H12O6 + 6O2

Carbon dioxide

Water

Glucose

Oxygen

**Cellular Respiration**C6H12O6 + 6O2🡪 6CO2 + 6H2O + energy

**glucose**

**oxygen**

**Carbon dioxide**

**water**

1. Fill in the empty boxes in the cellular respiration equation. (4 pts)
2. Carbon is represented by the letter C. There is carbon in glucose. Look at the equation for photosynthesis. Where does the carbon in glucose come from? (2 pts)  
   **Carbon dioxide**
3. Look at the equation for cellular respiration. What happens to the carbon in glucose? (2 pts) **It gets converted in carbon dioxide**