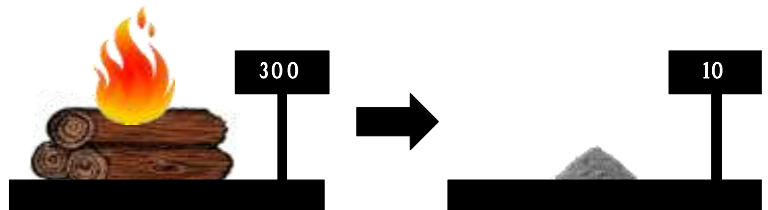
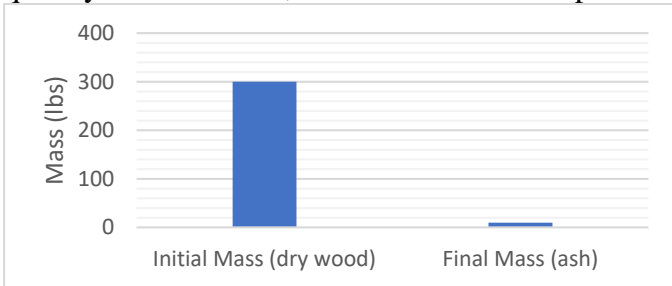


Biology Fall Semester Final Exam

Name: _____ Hour _____ Date: _____ Score: _____ / _____

Background: A spark from a nearby fire lands on some dry leaves on a 300 lb. pile of wood, causing it to burn quickly. After a while, all that remains are a pile of ashes weighing 10 lbs.

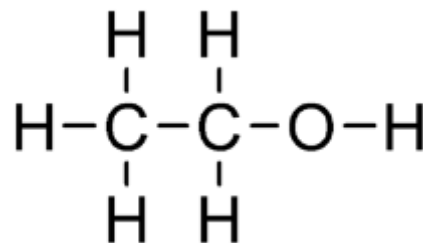
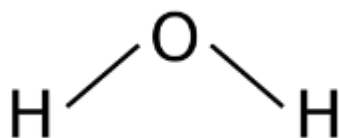


1. **How was matter and energy transformed as the wood was burned? What happened to the matter and energy in the wood after combustion ended?**

Score: _____ Comments:

2. Both ethanol and water are clear liquids. **Why does ethanol burn but water does not?**

Score: _____ Comments:



Page Score: _____ / 6

Background: Each animal in a herd of cattle consumes about 15 lbs. of food per day. On average, each animal gains about 1.5 lbs. per day.

3. Their feed contains macromolecules such as carbohydrates, fats, and proteins. **What happens to these macromolecules in the animal's digestive tract after they are consumed?**



For a steer to gain 1.5 lbs. per day...



...it must consume 15 lbs. of food.

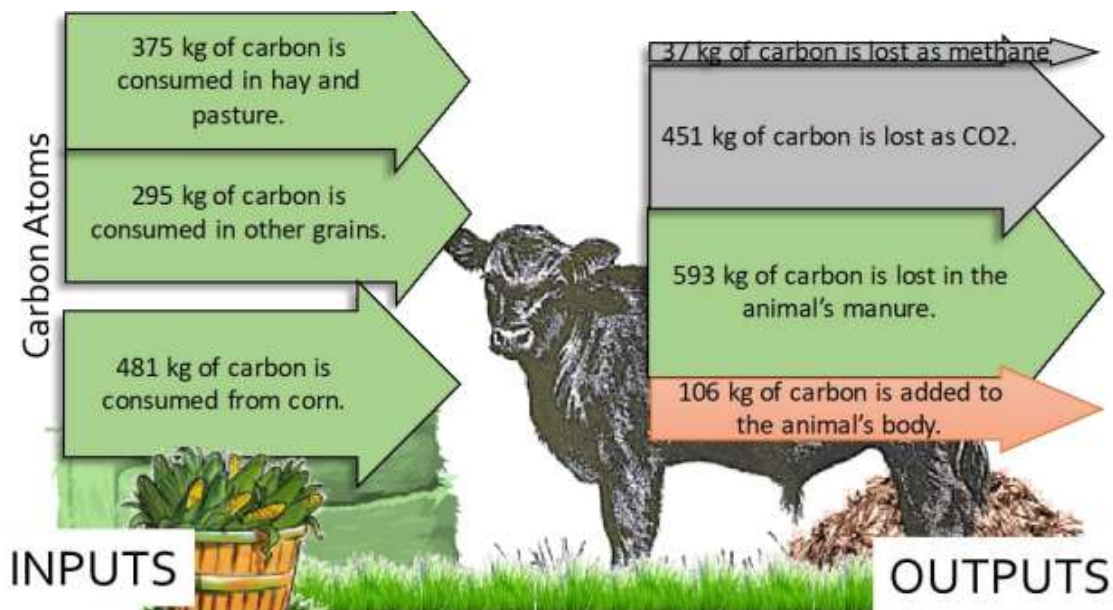
Score: _____ Comments:

4. **What happens to the matter and energy in food that is not added to the animal's body?**

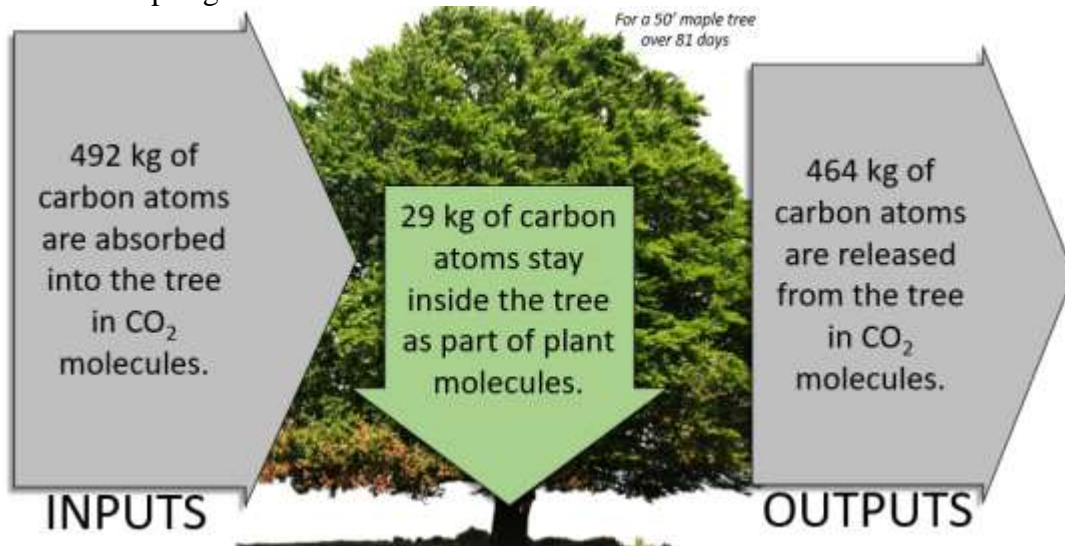
Score: _____ Comments:

5. Some of the matter and energy in the food will be added to the animal's body. **How does this occur?**

Score: _____ Comments:



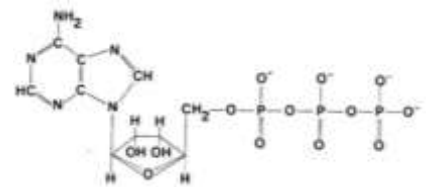
Background: The data below show the amount of carbon atoms that will be absorbed and released from a 50-foot maple tree between spring and autumn.



6. Between spring and autumn, a 50-foot maple tree will gain about 60 kg (132 lbs.) of atoms. A full-grown maple tree can weigh as much as 9000 kg (roughly 20,000 lbs. or 10 tons). **Where does the mass of a tree come from? How do these atoms become a part of the tree?**

Score: _____ Comments:

A molecule of ATP contains carbon, oxygen, hydrogen, nitrogen, and phosphorus. Three students are debating how a plant cell acquires the atoms in an ATP molecule. Their ideas are summarized below.



Nina: The plant produces this molecule by absorbing water and carbon dioxide and rearranging the atoms.

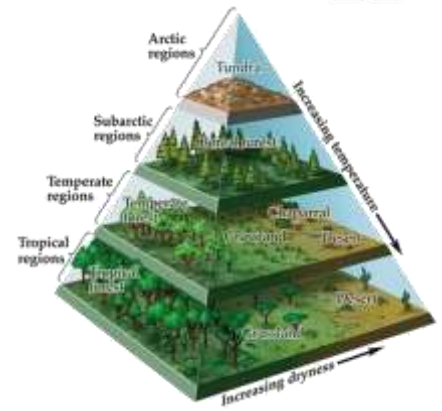
Oscar: The carbon, oxygen, and hydrogen atoms came from glucose. Other atoms were absorbed from the soil.

Marcos: The plant uses enzymes to change individual carbon atoms into the phosphorus and nitrogen atoms.

7. **Which claim seems most accurate? _____ Why? _____**

Score: _____ Comments:

Background: Tropical rainforests generally have high biodiversity, have larger carrying capacities, and tend to be more resilient to disruptions. Alternatively, tundra ecosystems have less biodiversity, have lower carrying capacities, and are more susceptible to threats and disturbances.

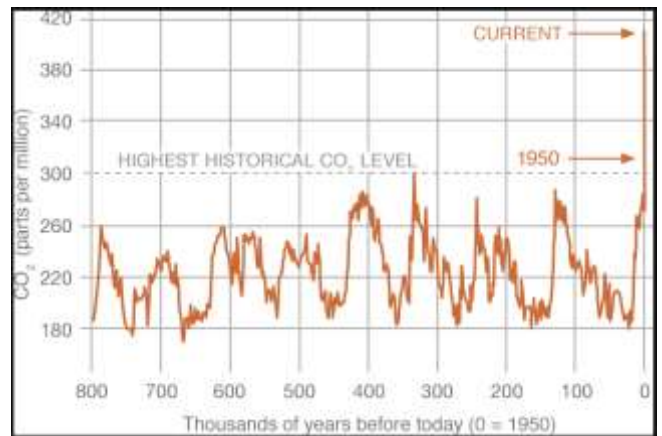


8. **Why are there differences between tropical rainforests and tundra ecosystems regarding the levels of biodiversity, carrying capacity, and resiliency?**

Score: _____ Comments:

Background: The NASA graph on the right shows changes in atmospheric CO₂ levels over the past 800,000 years.

9. **A) What does this data indicate about how CO₂ levels today compare to the past 800,000 years?**
B) How do the molecular properties of greenhouse gases (like CO₂) enable it to affect temperature?
C) Summarize an example of a disturbance that results from increases in CO₂ concentrations.



Score: _____ Comments:

Page Score: _____ / 6