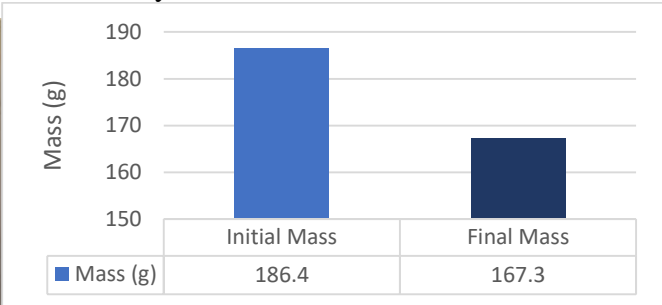
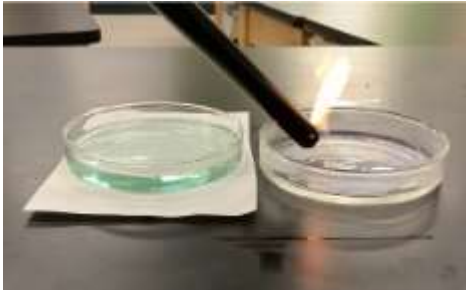


2022-23 PREVIEW of Biology Fall Final Exam

Name: _____ Hour _____ Date: _____ Score: _____ /33

Background: A team of students record the mass of a petri dish of ethanol. They then light the ethanol on fire and cover the flame. After the flame goes out, they record the mass again. Their data are below. They also observe that their BTB near the flame changed from blue to yellow. This indicates that CO₂ levels increased.



- As ethanol combusts, its mass changes. Why? What is happening to the atoms in the ethanol?
 - As ethanol combusts, the flame releases light and heat. Where did this energy come from?

Score _____ /3

Complete

Accurate

Precise

Comments:

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

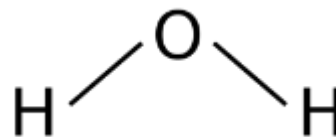
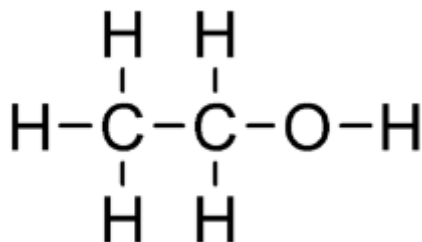
Score _____ /3

Complete

Accurate

Precise

Comments:



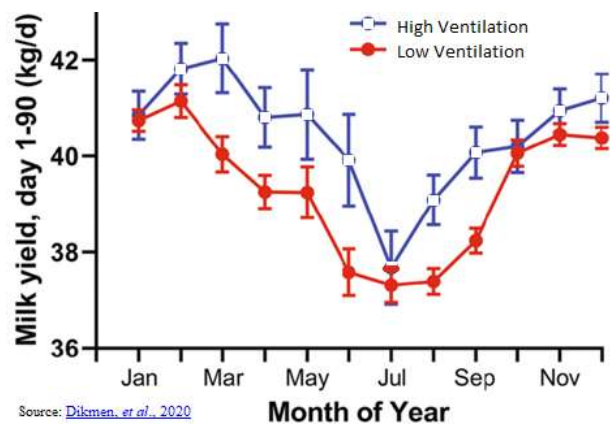
Page Score: _____ / 6

Background: 1) Researchers were unsure how oxygen availability affects milk production in cows. 2) They predicted that more oxygen would improve milk production. 3) They thought this because oxygen is used in cell respiration. 4) They changed the amount of ventilation and measured average milk production (kg/day).

3. Which of the following best describes sentence 1)?
a. XXXX b. XXXX c. XXXX d. XXXX
4. Which of the following best describes sentence 2)?
a. XXXX b. XXXX c. XXXX d. XXXX
5. Which of the following best describes sentence 3)?
a. XXXX b. XXXX c. XXXX d. XXXX
6. What is the XXXX variable in this experiment?
a. XXXX b. XXXX c. XXXX d. XXXX

7. Which of the following claims is most supported by their data? (shown here →)
a. XXXX.
b. XXXX.
c. XXXX.

8. Explain how and why changing ventilation & oxygen availability affects milk production. Include and underline the following in your response: *cellular respiration, mitochondria, ATP*.



Score _____ /3

Complete

Accurate

Precise

Comments:

9. A growing cow eats 15 lbs. of food per day but only gains 1.5 lbs. It produces about 7 lbs. of feces daily.
 - A) How does a cow gain mass from the food it eats? Address *macromolecules* in your response.
 - B) Why does the cow only gain 1.5 lbs.? What happened to the rest of the mass of the consumed food?

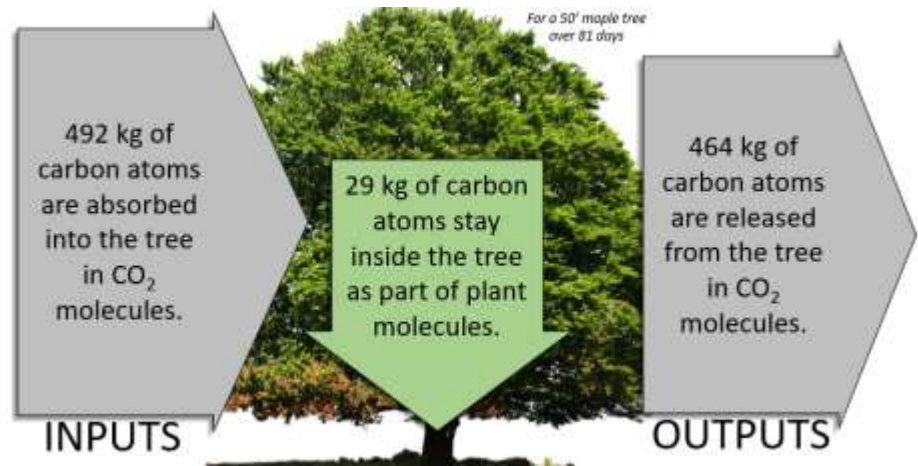
Score _____ /3

Complete

Accurate

Precise

Background: A team of researchers studies the amount of carbon atoms that will be absorbed and released from a 50-foot maple tree between spring and autumn. Their data are summarized here.



10. A 50-foot maple tree will add 29 kg (64 lbs.) of carbon atoms per year to its total mass. A full-grown maple tree weighs up to 9000 kg (~20,000 lbs.). **A) Where does most of the mass of a tree come from? B) How do these atoms become a part of the tree?**

Score _____ /3

Complete

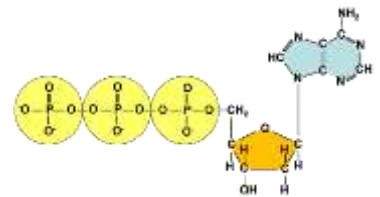
Accurate

Precise

Comments

11. Which is responsible for the 464 kg of carbon atoms that are *released* by the tree during this time?
- a. XXXX b. XXXX c. XXXX d. XXXX

Cells in the tree depend on ATP to function. An ATP molecule (*like this* →) contains carbon, oxygen, hydrogen, nitrogen, and phosphorus atoms. Three students debate how plant cells acquire the atoms in ATP. Their ideas are 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.

12. Which claim seems most accurate? _____ Why? _____

Score _____ /3

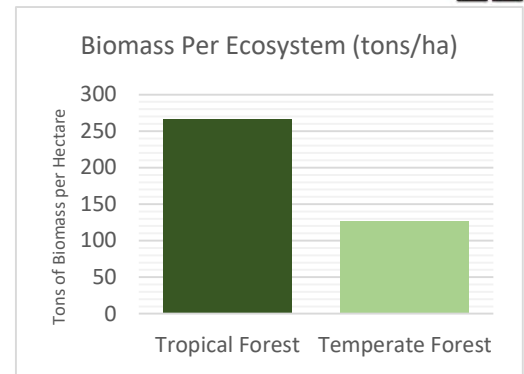
Complete

Accurate

Precise

Comments

Background: Researchers measured the amount of plant biomass that could exist per hectare (2.5 acres) in ecosystems like **tropical rainforests** (like those in the Amazon) and in **temperate forests** (like those in Wisconsin). Their data are shown here. (Neufeld, 2022)



13. A) Why are there differences in plant biomass between tropical rainforests & temperate forests? B) How do these differences affect the carrying capacity for primary consumers & secondary consumers in these ecosystems? Address *photosynthesis* and the *10% Rule* in your response.

Score _____ /3

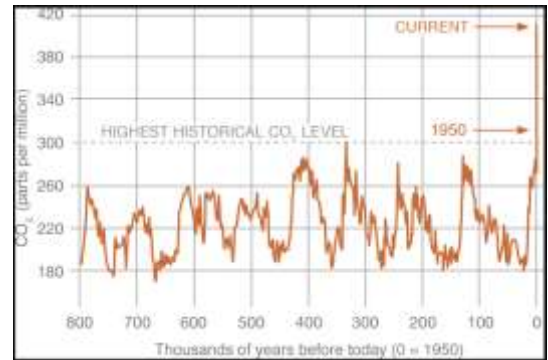
Complete

Accurate

Precise

Comments:

Background: Scientists at [NASA](https://www.nasa.gov) have studied changes in CO₂ levels using air samples preserved in ice. Their data (*right* →) shows how levels of atmospheric CO₂ have changed over the past 800,000 years.



14. A) How and why would changes to CO₂ levels affect temperature? B) How do these change disrupt ecosystems throughout the world? In your response, include & underline the following: *greenhouse gas*, *light*, *infrared radiation*, *temperature*.

Score _____ /3

Complete

Accurate

Precise

Comments:

15. If CO₂ levels continue to increase at this rate, how will it affect ecosystems and human activity?

Score _____ /3

Complete

Accurate

Precise

Comments: