Photosynthesis Practice

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2017

11. Which of the following incorrectly compares C3 versus C4 plants?

	C3 plants	C4 plants
A.	Rubisco performs initial carbon fixation step	PEPase performs initial carbon fixation step
B.	Loses water and energy through photorespiration	No or very low photorespiration rate
C.	RuBP initially accepts carbon diozide	PEP initially accepts carbon dioxide
D.	Most plants	Tropical grasses
E.	Spatial separation of carbon fixation and photosynthesis	Temporal separation of carbon fixation and photosynthesis

2017

15. Consider the following experiment similar to those first performed in the 1950's. Individual *Arabidopsis thaliana* plants are grown in a hydroponic solution (without soil). Some plants (Group A) are grown in water labeled (20%) with oxygen-18 and atmospheric air with unlabeled CO_2, while others (Group B) are grown in unlabeled water and atmospheric air with 50% of the CO_2 labeled with oxygen-18. Gases produced by the plant are collected for 20 minutes. After 1 day, the following are analyzed for oxygen-18 content: the collected gas, tissue from the plants, and tissue from the plants baked until dry. The results are as follows, where a + indicates a statistically significant enrichment and a - indicates no enrichment:

	Collected gas	Plant tissue	Dried plant tissue
Group A (H_2O labeled)	+	-	-
Group B (CO_2 labeled)	-	+	+

Assuming that the detailed mechanisms of photosynthesis have not yet been discovered, what would be concluded about photosynthesis from this experiment?

A. The oxygen atoms in plant sugars (or other organic compounds) are derived from water.
B. The oxygen atoms in the CO_2 produced by plant respiration originated from water.
C. The oxygen atoms in the labeled CO_2 were incorporated into plant sugars (or other organic compounds) only.
D. Oxygen (O_2) is formed from the splitting of water during photosynthesis.
E. The oxygen in the labeled CO_2 was released as O_2.

2017

16. One day, you discover a mysterious blue dye in dusty old cabinet at the end of your lab bench. After experimentation, you realize that your dye binds to acidic solutions. You apply this dye to some plant specimens and find that certain parts of cell are especially dyed. Out of the following four choices you find that exactly two of them bind to your dye. Which of the following bind to your dye? Choose ALL that apply.

A. Thylakoid lumen.
B. Chloroplast stroma.
C. Cell cytosol.
D. Mitochondria matrix.

2014

12. You are walking down Fridhemsgatan in Stockholm, Sweden and you develop a sudden urge for a piece of pizza. You see the Bella Vista Restaurang and go inside and decide to order their specialty the Bella Vista as shown in the picture on the right. As a biology student, you quiz yourself about which ingredient on your pizza as shown in this picture is NOT produced by photosynthesis.

A. Box.
B. Oil.
C. Mushrooms.
D. Onions.
E. Sauce.

http://en.wikipedia.org/wiki/File:Pizza_bella_vista.jpg

2013

13. Which of the following does not take part in the light reactions of photosynthesis?

A. Photosystem I
B. Photosystem II
C. Rubisco
D. ATP synthase
E. Cytochrome complex

2013

17. Place the following statements regarding photosynthesis in C4 plants in the correct order:

I. ATP is used to convert pyruvate to phosphoenolpyruvate (PEP).
II. Mesophyll cells export four-carbon products such as malate through plasmodesmata to the bundle-sheath cells.
III. PEP carboxylase adds CO_2 to PEP to produce oxaloacetate.
IV. CO_2 is used to produce G3P in the Calvin cycle.
V. CO_2 is released in cells that contain the protein rubisco, which binds it.

A. II, V, IV, I, III
B. V, II, III, IV, I
C. I, III, V, II, IV
D. I, III, II, V, IV
E. I, V, III, II, IV

Which of the following organisms is NOT an autotroph?

W) Pigmented sulfur bacteria

X) Palm tree

Y) Nitrifying bacteria

Z) Mosquito

Which of the following is the BEST description of photorespiration:

W) the process whereby primitive bacteria use light to help oxidize inorganic molecules

X) the competition of carbon dioxide and molecular oxygen for Rubisco

Y) the gaining of chemical energy in photosynthesis

Z) the loss of reduced electrons from photosystem one

In which of the following does the RUBISCO enzyme play a central role:

W) Photosystem One

X) Electron Transport

Y) Photosystem Two

Z) Calvin Cycle

Thanks!