Photosynthesis Reactants and Products

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

The simplified net equation for photosynthesis is $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$. Light provides the energy for this process.

1 Which two substances are the reactants shown in the net equation?

(1) Carbon dioxide and water

(2) Glucose and oxygen

(3) Water and oxygen

(4) Carbon dioxide and glucose

2 Identify the source of the carbon atoms in glucose using the net equation. [1]

Answer and work

_____

_____

3 Count the oxygen atoms on each side of the net equation. Show how the formulas and coefficients give those counts. [1]

Answer and work

_____

_____

4 Which statement describes the energy change in photosynthesis?

(1) Light provides atoms to form glucose.

(2) Light energy is converted to chemical energy stored in products.

(3) Chemical energy is converted entirely to heat.

(4) Oxygen releases light that splits glucose.

Aquatic Plants and Light

Use the information below to answer the questions.

A class monitors dissolved oxygen around equal masses of the same aquatic plant for 15 minutes. All containers begin at the same oxygen concentration and temperature. The class changes only the light level.

Light level	Initial oxygen (mg/L)	Final oxygen (mg/L)
Bright	7.0	8.5
Dim	7.0	7.3
Dark	7.0	6.6

5 Which container shows the largest increase in dissolved oxygen?

(1) Bright

(2) Dim

(3) Dark

(4) All have equal increases.

6 Calculate the difference between the changes in dissolved oxygen in bright and dim light. Include units. [1]

Answer and work

7 Assume photosynthesis and cellular respiration account for all changes in dissolved oxygen. Explain why the increase in bright light represents a net change. [1]

Answer and work

8 Which adjustment would best help identify an oxygen change caused by the water and container alone?

(1) Use a larger plant in every container.

(2) Measure a matched container with no plant under the same light conditions.

(3) Increase the recording time only for the bright container.

(4) Use different initial oxygen levels for each light level.