Unit 4 (Cell Energy) Practice SOL Questions

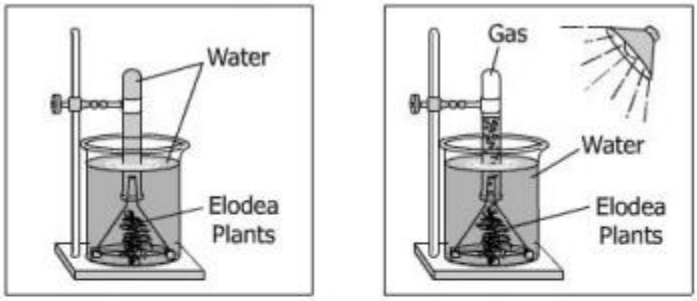
Chloroplast Process

$$\underline{X} + H_2O \longrightarrow \underline{Y} + O_2$$

The diagram shown represents the input and output of a process performed by the chloroplast of a cell. Which substance is most likely represented by Y?

- **A** Glucose
- **B** CO_2
- **C** ATP
- **D** Light

Student Experiment With Elodea Plants

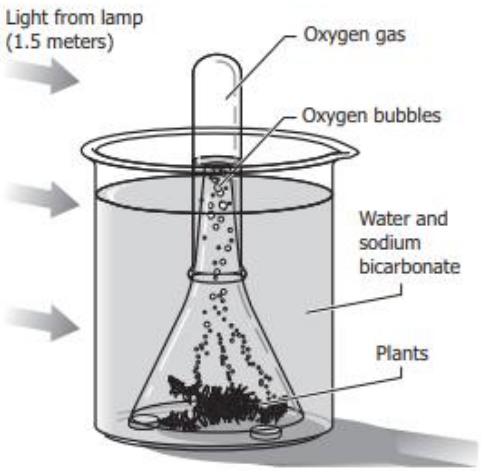


24-Hour Setup Without Light **24-Hour Setup With Light**

After 24 hours, the amount of gas that accumulated at the top of the inverted test tube is measured. The students conclude that the light source is causing the water to evaporate, causing water vapor to fill the top of the tube. The best alternative explanation of the differences between the setups is that the —

- **A** gravity increased the downward flow of the trapped water
- **B** metabolism of the elodea plants absorbed CO_2 from the water
- **C** heat from the light source caused the escape of dissolved gas
- **D** light caused the elodea plants to photosynthesize, releasing O_2 gas

Photosynthesis Experiment



The picture shows a student's experiment with *Elodea*, a common aquatic plant. Which change in this experiment is *most* likely to increase the volume of oxygen gas that accumulates in the top of the tube?

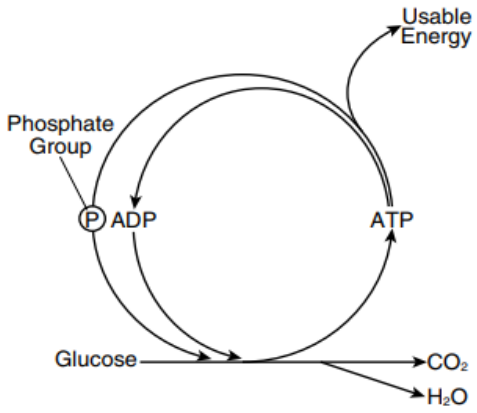
F Use fewer plants
G Replace the beaker with a larger container
H Move the light source closer to the beaker
J Reduce the amount of water

A student observes that a type of eubacteria contains chlorophyll. Which of these does this type of bacteria have in common with plants?

A It is photosynthetic.
B It contains vascular tissues.
C It contains mitochondria.
D It is heterotrophic.

Which of these is required for aerobic cellular respiration?

F Carbon dioxide
G Sunlight
H Oxygen
J Chlorophyll



The picture models a cellular metabolic process. The *main* purpose of this process is to produce —

A phosphate groups
B usable energy
C ADP
D H_2O

In the human body, muscle cells have an increased need for energy during exercise. To help supply this energy, the body will immediately increase —

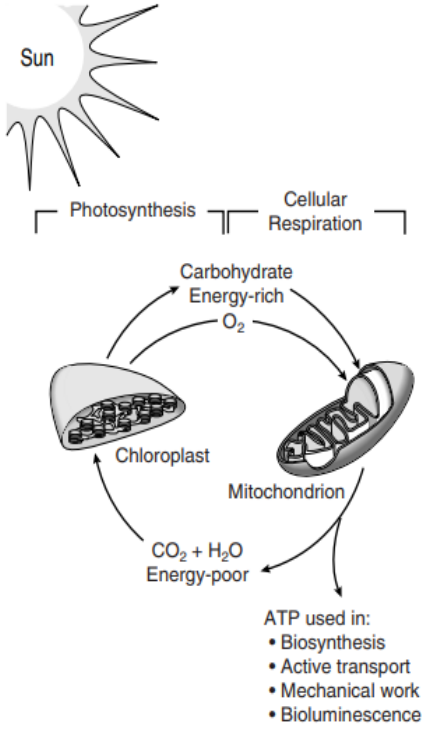
A food intake to increase the substances available for respiration
B the need for waste products to be retained
C activity in the nervous system to stimulate intake of carbon dioxide
D the breathing rate to supply more oxygen to cells for the release of energy

The energy in the food produced by autotrophs or taken into the bodies of heterotrophs must be changed into a form that cells can use. The energy-transferring molecule used by cells is —

A DNA
B RNA
C ATP
D CO_2

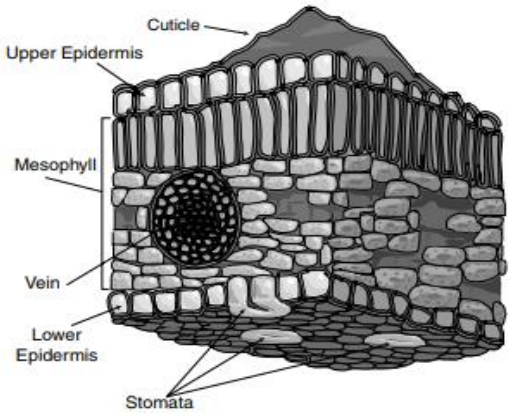
Algae and multicellular plants are autotrophs because they —

A decompose dead organisms
B absorb nutrients from soil
C break down starches to glucose
D capture sunlight to produce sugars



Which statement is supported by the diagram?

F The mitochondrion uses the sun's energy directly.
G The end products of photosynthesis do not provide energy for cellular respiration.
H The main source of energy for photosynthesis is carbohydrates.
J Carbohydrates are converted into ATP by the mitochondrion.



Which area of the leaf is most responsible for protecting the leaf from the drying effects of the air?

A The epidermis
B The mesophyll
C The vein
D The cuticle

Compared to a skin cell, a muscle cell is likely to have more —

F Golgi bodies
G mitochondria
H cell membranes
J chloroplasts

Which of these processes is carried out in the same way in both plants and animals?

A Cellular respiration
B Asexual reproduction
C Circulation of body fluids
D Excretion of metabolic waste

Which of the following is most effective in helping rain forest plants trap sunlight so that light energy can be converted to chemical energy?

A Large leaf size
B Large root size
C Small stem
D Small seed size

Comparison of Photosynthesis and Respiration

	Photosynthesis	Respiration
Raw Materials	water and CO_2	glucose and oxygen
Products	glucose and oxygen	water and CO_2
Purpose	store energy	release energy

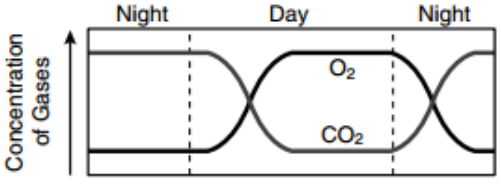
The processes of photosynthesis and respiration can be thought of as a cycle because —

A one is used only by plants and the other is used only by animals
B both give off oxygen to be used by animals
C the products of one are used as the raw materials of the other
D they both have the same purpose

Scientists hypothesize that oxygen began to accumulate in Earth's atmosphere *after* the appearance of living things with the ability to —

F form tissues
G reproduce sexually
H photosynthesize
J breathe air

O_2 and CO_2 Levels in a Pond



The above graph shows how dissolved O_2 and CO_2 levels changed in a pond over a 24-hour period. What caused the decrease in O_2 concentration during the night?

F Increased evaporation
G Decreased photosynthesis
H Increased respiration
J Decreased temperatures