

Photosynthesis and Respiration

Objectives

To increase understanding of

To improve skills in

- photosynthesis
- respiration
- comprehending written information
- critically examining statements
- expressing ideas in writing

Instructions

Use the information below to answer the questions which follow.

Photosynthesis is the process in plants which uses carbon dioxide and water to make sugars. Ultraviolet energy is needed for photosynthesis to occur, so, unless artificial ultraviolet light is provided, it can only occur during the day. The green pigment, chlorophyll, is also needed as a catalyst for photosynthesis. The chemical equation for photosynthesis is:



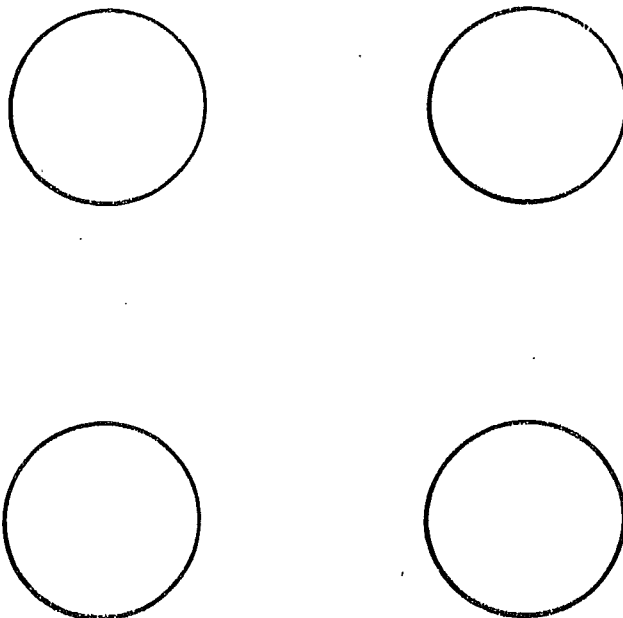
The sugar produced during photosynthesis is transported from the leaves by phloem vessels to all parts of the plant where it is used in respiration, or it is stored as starch for later use in respiration.

Respiration is the process in plants and animals which provides the energy for all other processes which must continue for the organism to live. Respiration is the reverse of photosynthesis, in that it uses sugar and oxygen in the production of energy and produces carbon dioxide and water as waste products.

Questions

1. What is photosynthesis?
2. Write the equation which represents the process of photosynthesis.
3. What is respiration?
4. Write the equation which represents the process of respiration.
5. When does photosynthesis occur in nature? Why?
6. When does respiration occur in living things? Why?
7. What is required for photosynthesis but not for respiration?

8. Why is photosynthesis important for us?
9. Considering your answers to questions 6, 7 and 8, what can you say about the rates at which plants must photosynthesise compared to the rate at which all living things respire? Explain your answer.
10. If photosynthesis produces oxygen, and respiration uses oxygen, how come there is enough oxygen left over for animals to breathe?
11. A student once said "plants breathe back to front to animals". Explain how this statement is partly true, but at the same time, it is partly false.
12. If all the plants in the world were to die, the animals would eventually follow them. Why?
13. If all the animals in the world were to die, the plants would eventually follow. Why?
14. Flowers in hospital wards are removed during the night. Why?
15. (a) Copy the following diagram into your book:



- (b) Place the following labels in the circles — one in each circle — and then draw four arrows to connect the four circles so that the diagram explains the relationship between plants, animals, photosynthesis and respiration.
Labels: oxygen, carbon dioxide, plants, plants and animals
- (c) Place the following labels on the arrows you have drawn to complete the diagram:
Labels: produced by photosynthesis, produced by respiration, needed for photosynthesis, needed for respiration