

# Plant nutrition

## Question Paper 1

Level	IGCSE
Subject	Biology (0610/0970)
Exam Board	Cambridge International Examinations (CIE)
Topic	Plant nutrition
Sub-Topic	Plant nutrition
Booklet	Question Paper 1

**Time Allowed:** 36 minutes

**Score:** /30

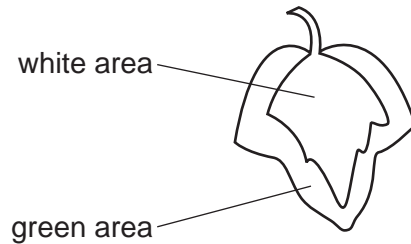
**Percentage:** /100

**Grade Boundaries:**

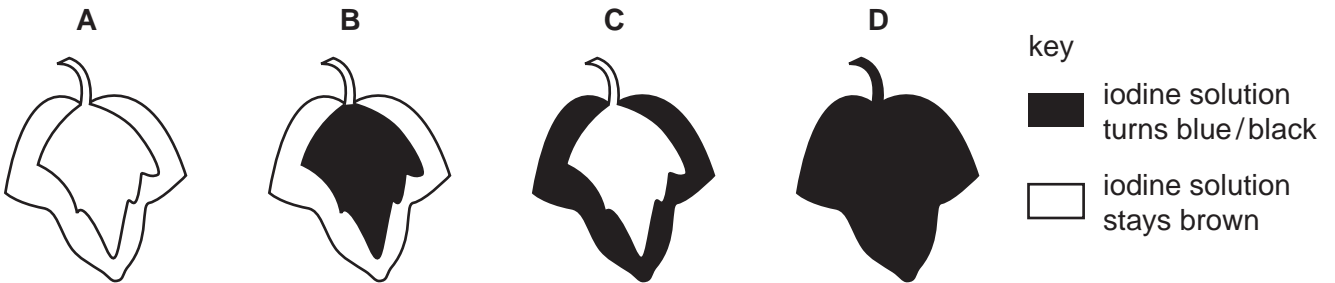
9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	53%	48%	40%	33%	<25%

1. In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.



Which diagram shows the result of the experiment?



2. Which substance, needed for protein synthesis, is carried into a leaf from the stem?

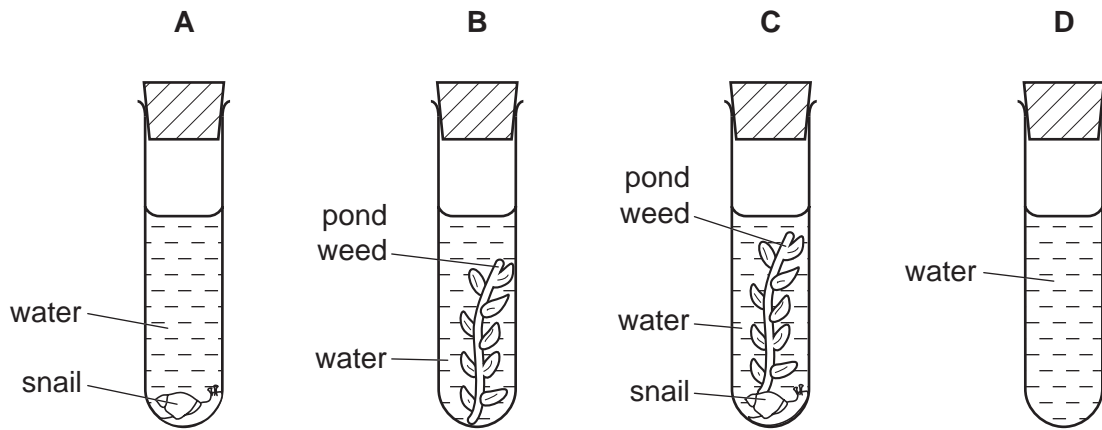
- A carbon dioxide
- B nitrate
- C oxygen
- D starch

3. Which two substances are the products of photosynthesis?

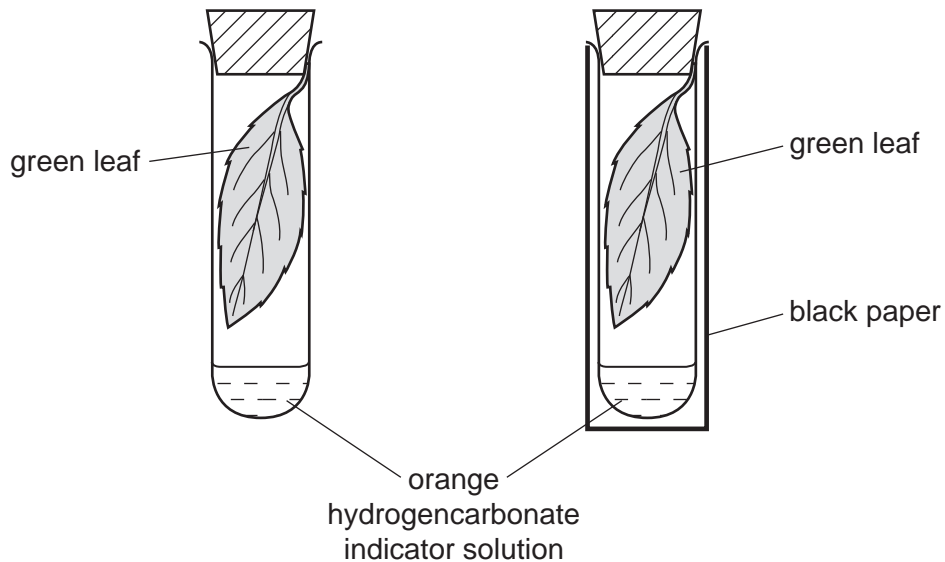
- A carbon dioxide and glucose
- B carbon dioxide and water
- C oxygen and carbon dioxide
- D oxygen and glucose

4. Four test-tubes are set up as shown in the diagram and left in full sunlight.

After several hours, which test-tube contains the most dissolved oxygen?



5. Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.



After a few hours, which colour would the hydrogencarbonate indicator solution be in each tube?

	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

- 6 For the stomata of a leaf to open, the guard cells accumulate more potassium ions than the surrounding cells.

Which row describes what happens?

	movement of potassium ions	movement of water in relation to guard cells	final state of the guard cells
<b>A</b>	active transport	in	turgid
<b>B</b>	active transport	out	flaccid
<b>C</b>	diffusion	in	plasmolysed
<b>D</b>	diffusion	out	no change

7. Plants manufacture their own supplies of carbohydrate.

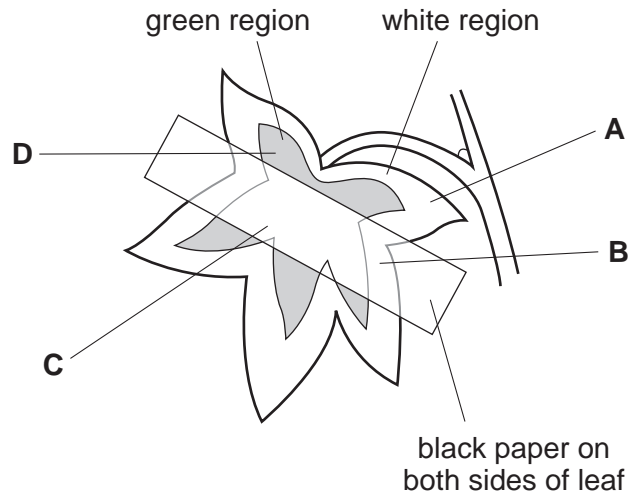
What are the raw materials and the waste product of this process?

	raw materials	waste product
<b>A</b>	carbon dioxide and chlorophyll	oxygen
<b>B</b>	carbon dioxide and water	oxygen
<b>C</b>	oxygen and chlorophyll	carbon dioxide
<b>D</b>	oxygen and water	carbon dioxide

8. A plant with variegated leaves has the starch removed from its leaves by placing it in a dark cupboard for 48 hours.

Black paper is then fixed on one leaf as shown and the plant is exposed to light.

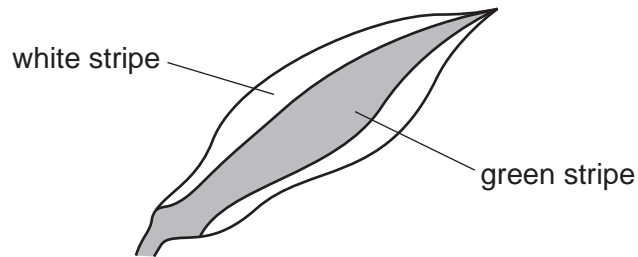
After 24 hours, which part of the leaf contains starch?



9. Which row shows the effects of deficiencies in nitrate and magnesium ions on plant growth?

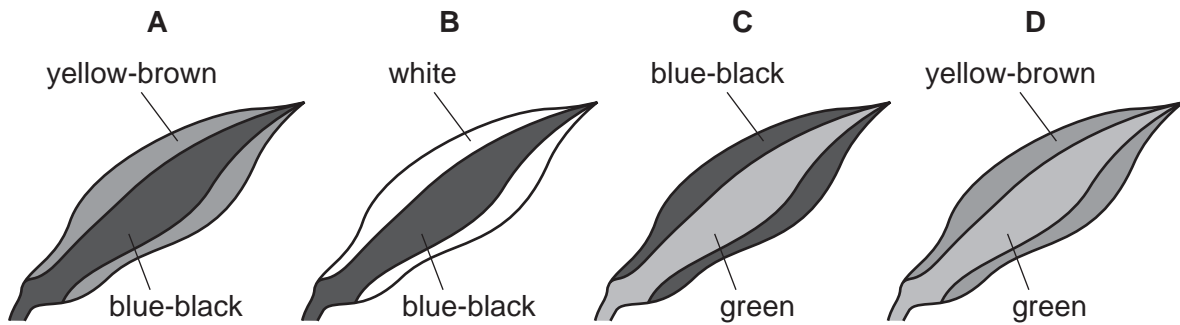
	effect of nitrate ion deficiency	effect of magnesium ion deficiency
<b>A</b>	green leaves	long roots
<b>B</b>	long roots	thin stem
<b>C</b>	stunted growth	yellow leaves
<b>D</b>	thick stem	large leaves

10. A plant with striped leaves similar to the one below was kept in bright light for six hours.

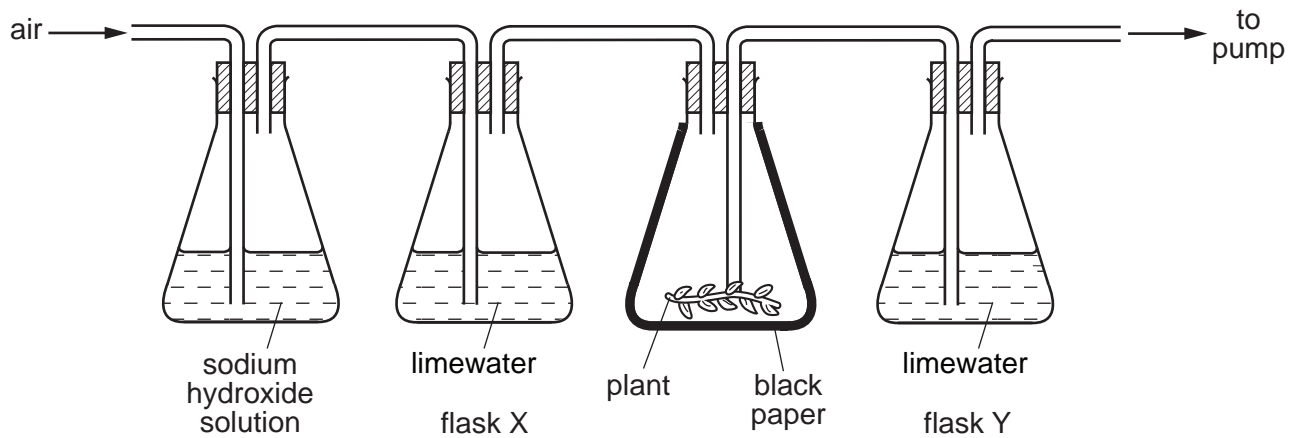


A leaf was taken from the plant and the chlorophyll removed. It was then tested for starch using iodine solution.

Which diagram shows the result of the test?



11. Apparatus was set up as shown.

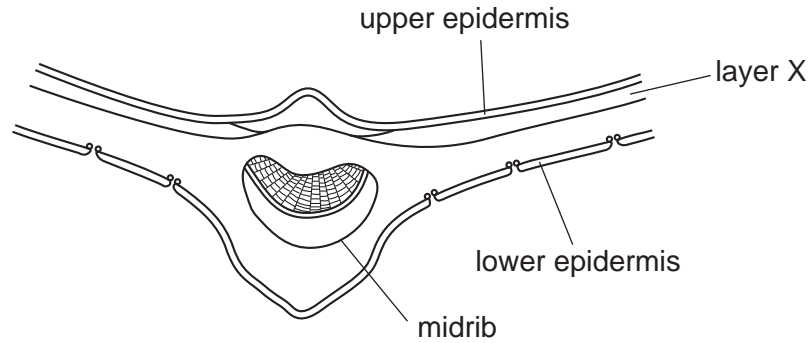


Sodium hydroxide removes carbon dioxide from the air. Limewater goes cloudy if carbon dioxide is bubbled through it.

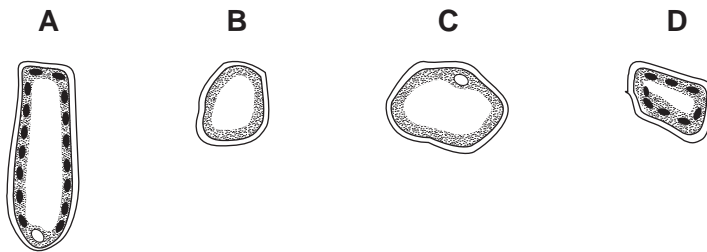
What happens to the limewater in flasks X and Y when the pump is switched on?

	flask X	flask Y
<b>A</b>	goes cloudy	goes cloudy
<b>B</b>	goes cloudy	stays clear
<b>C</b>	stays clear	goes cloudy
<b>D</b>	stays clear	stays clear

12. The diagram shows a cross-section of part of a leaf.



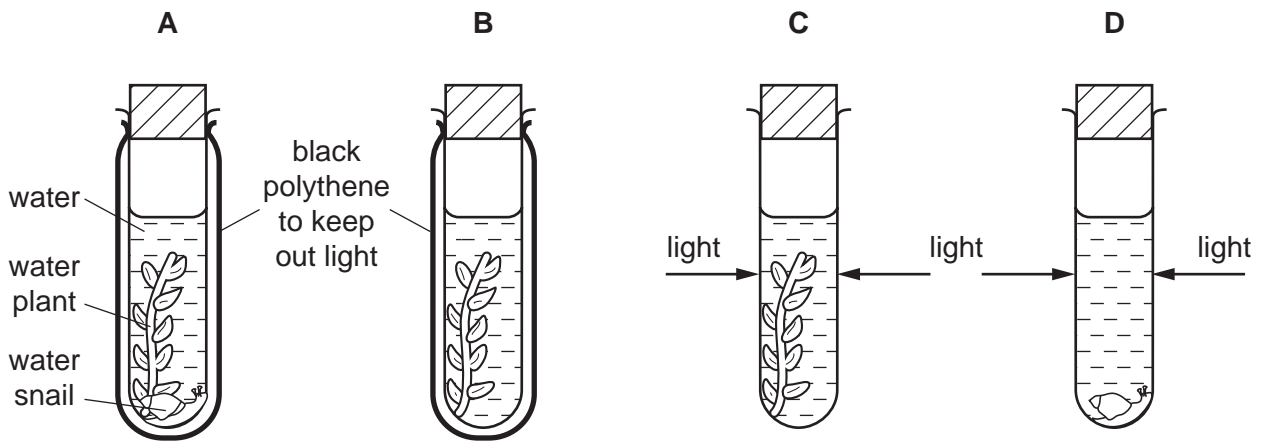
Which type of cell is found in layer X?



13. An experiment was done using the apparatus shown in the diagram.

The carbon dioxide content of the water in each tube was measured at the start and again three hours later.

In which tube would there be a **decrease** in carbon dioxide content?





14. What is formed first in a leaf as a result of photosynthesis?

- A chlorophyll
- B glucose
- C starch
- D water

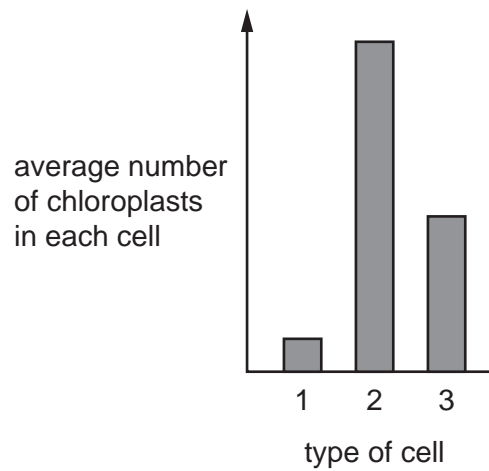
15. Which product of photosynthesis moves out of a green leaf through its stomata?

- A carbon dioxide
- B glucose
- C oxygen
- D water

16. Which two substances are needed for photosynthesis?

- A carbon dioxide and glucose
- B carbon dioxide and water
- C oxygen and glucose
- D oxygen and water

17. The bar chart shows the average number of chloroplasts in each of three different types of leaf cell.

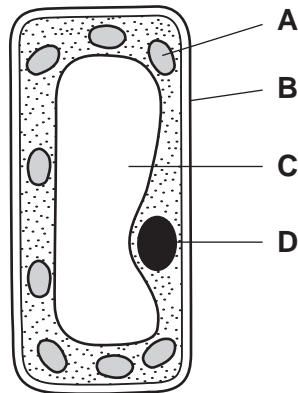


What are the three types of cell?

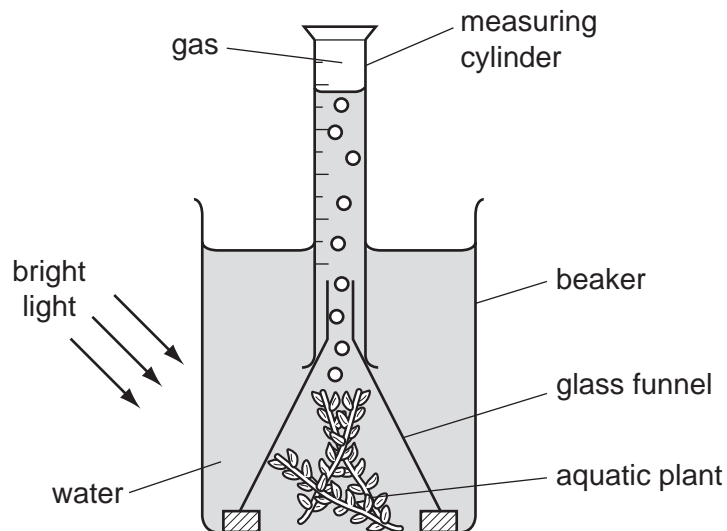
	1		
<b>A</b>	guard cell	palisade mesophyll cell	spongy mesophyll cell
<b>B</b>	palisade mesophyll cell	spongy mesophyll cell	guard cell
<b>C</b>	spongy mesophyll cell	guard cell	palisade mesophyll cell
<b>D</b>	spongy mesophyll cell	palisade mesophyll cell	guard cell

18. The diagram shows a palisade cell.

In which region is starch stored?



19. The diagram shows the apparatus used in an investigation to measure the rate of oxygen production during photosynthesis.



The investigation was repeated several times and the average amount of gas collected was calculated.

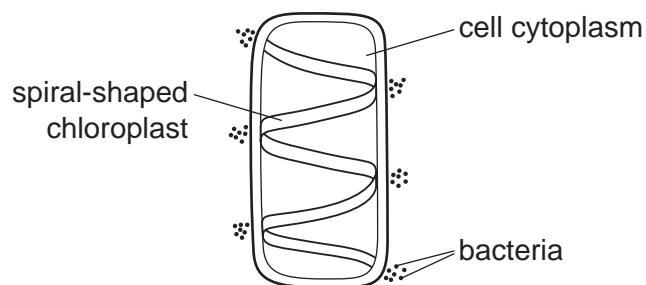
Which **two** factors must be kept constant during this investigation?

- A the amount of water in the beaker and the height of the measuring cylinder
- B the size of aquatic plant and the amount of gas in the measuring cylinder
- C the size of aquatic plant and the duration of exposure to light
- D the size of the beaker and the funnel

20. Which form of energy is stored within glucose molecules made during photosynthesis?

- A chemical
- B heat
- C light
- D mechanical

21. The diagram shows a cell with groups of bacteria around its edge.



The bacteria move to areas of high oxygen concentration.

Which process in the cell causes the bacteria to form these groups?

- A digestion
- B photosynthesis
- C reproduction
- D respiration

22. The roots of plants take up nitrates from the soil.

What are the nitrates used to make?

- A fat
- B glucose
- C protein
- D starch

23. What does photosynthesis form in a leaf first?

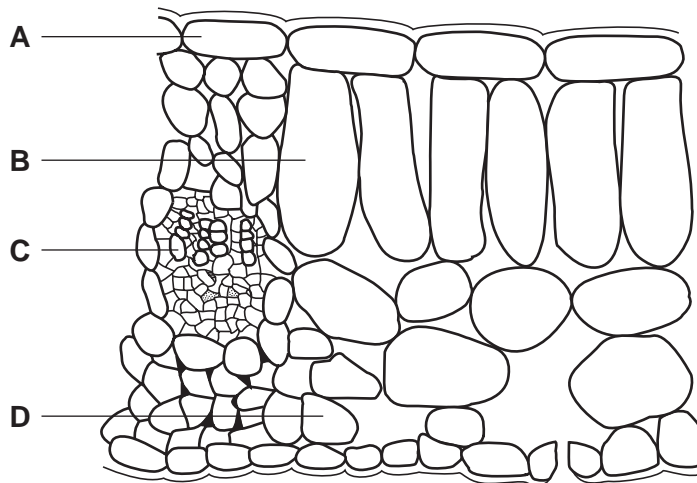
- A cellulose
- B protein
- C starch
- D sugar

24. What is formed first in a leaf as a result of photosynthesis?

- A cellulose
- B protein
- C starch
- D sugar

25. The diagram shows a section through a leaf.

Which cell type absorbs the most carbon dioxide during the day?



26. Which element is found in a molecule of chlorophyll?

- A calcium
- B iron
- C lead
- D magnesium

27. Which substances do root hairs take from the soil?

- A water and carbon dioxide
- B water and mineral ions
- C carbon dioxide and oxygen and mineral ions
- D carbon dioxide and oxygen and water

28. Which cell type contains the **most** chloroplasts?

- A palisade mesophyll
- B phloem
- C spongy mesophyll
- D xylem

29. What does a plant make with the nitrates it absorbs?

- A carbohydrates
- B fats
- C mineral salts
- D proteins

30. The diagram shows a section through a leaf, seen under the microscope.

In which part is the carbon dioxide concentration **lowest** on a warm sunny day?

