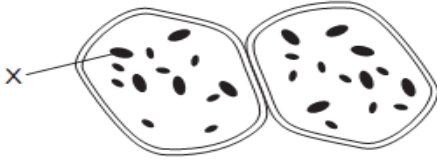


PPQ Unit 6 – Photosynthesis – Plant Nutrition

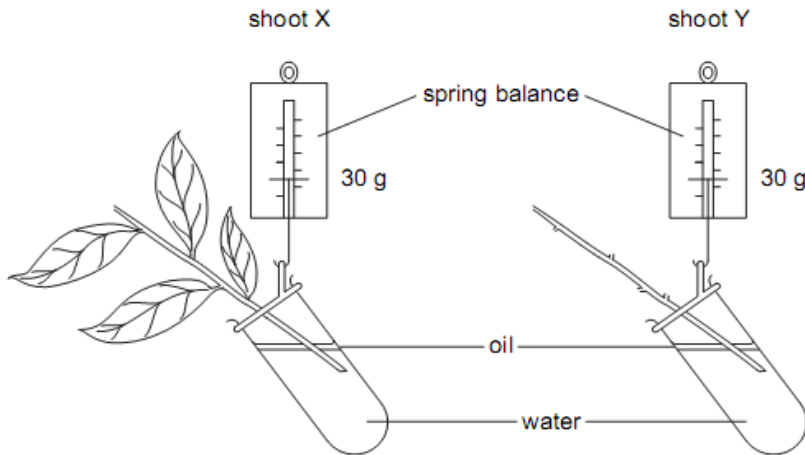
1 The diagram shows cells from a storage organ of a flowering plant after they have been stained with iodine solution.



Structures X stain black. What does this show that structures X contain?

- A chlorophyll
- B fat
- C starch
- D sugar

2 The diagram shows two shoots at the start of an experiment on transpiration.



What are the readings on the spring balances after three days?

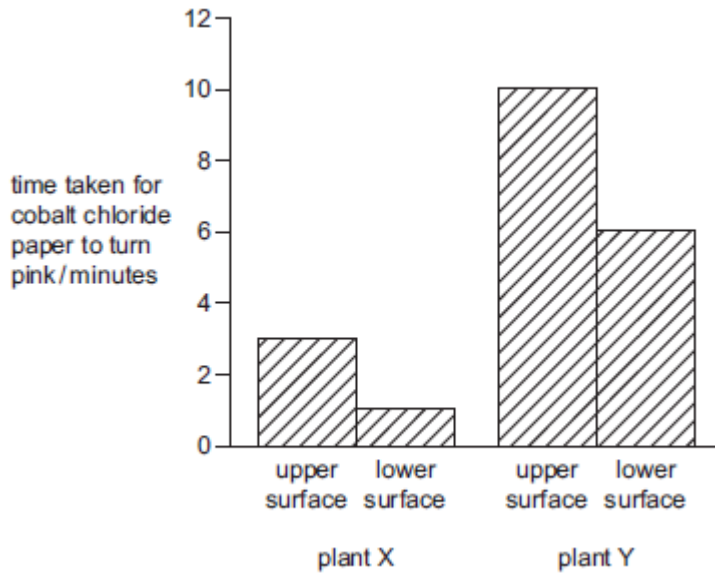
	shoot X	shoot Y
<b>A</b>	30 g	30 g
<b>B</b>	30 g	25 g
<b>C</b>	25 g	30 g
<b>D</b>	25 g	25 g

3 Which cell type contains the most chloroplasts?

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

4 Cobalt chloride paper is blue when dry but turns pink when wet. Some blue cobalt chloride paper was fastened to the upper and lower surfaces of a leaf on a plant X and a leaf on plant Y. The diagram shows the results of the experiment.

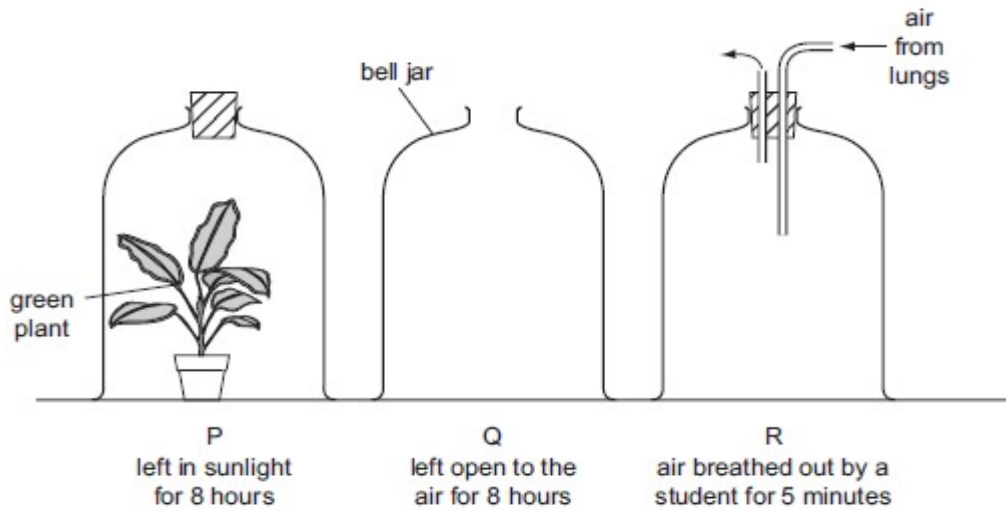
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Through which leaf surface was water lost most quickly?

- A plant X, upper surface
- B plant X, lower surface
- C plant Y, upper surface
- D plant Y, lower surface

5 In an experiment, three glass bell jars were set up as shown in the diagram.

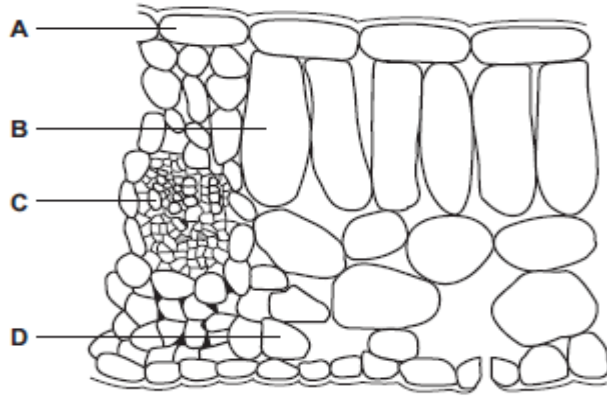


At the end of the experiment, which bell jar has the most oxygen and which has the least?

	most oxygen	least oxygen
<b>A</b>	P	Q
<b>B</b>	P	R
<b>C</b>	Q	P
<b>D</b>	R	P

6 The diagram shows a section through a leaf.

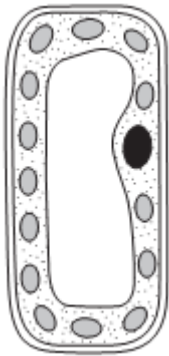
Which cell type absorbs the most carbon dioxide during the day?



7 Which element is found in a molecule of chlorophyll?

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

8 The diagram shows another plant cell.



Which feature indicates that it is a palisade cell?

- A a large nucleus
- B a large vacuole
- C a thick cell wall
- D many chloroplasts

9 The diagram shows a plant shoot and the same shoot six hours later.



plant shoot



same shoot six hours later

Which change in environmental conditions could cause this change in the appearance of the shoot?

- A a decrease in available water
- B a decrease in light intensity
- C a decrease in wind speed
- D an increase in humidity

10 Choose words from the list to complete each of the spaces in the paragraph. Each word may be used once only and some words are not used at all.

- bright                  dry                  dull                  heavy                  large                  light**
- sepals                  small                  stamens                  sticky                  style**

Flowers of plants that rely on the wind to bring about pollination tend to have ..... petals that have a ..... colour. Their pollen is normally ..... and ..... In these flowers, the ..... and the ..... both tend to be long. [6]

[Total: 6]

11 (a) (i) Name the two raw materials needed by plants for photosynthesis.

- 1 .....
- 2..... [2]

(ii) Name the gas produced by photosynthesis.

..... [1]

(b) Fig. 4.1 shows a leaf, with white and green regions, that is attached to a plant. The plant had been kept in the dark for 48 hours and then a lightproof, black paper cover was placed over part of the leaf.

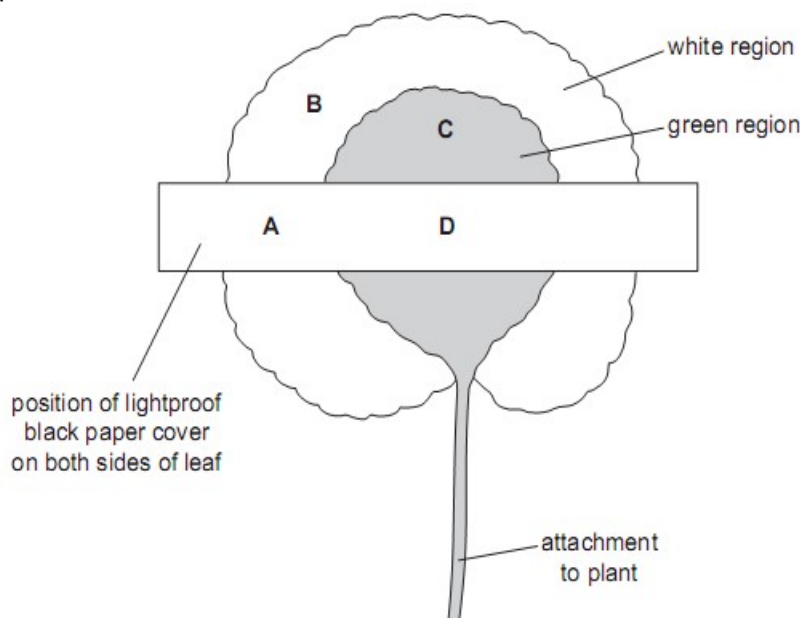


Fig. 4.1

The plant is left under a light for 24 hours. After this time the leaf is removed from the plant and is tested for the presence of starch.

(i) Which chemical reagent is used to show the presence of starch?

..... [1]

(ii) Record the colour you would see, if you had carried out this test, in each of the areas A, B, C, and D.

area	colour
A	
B	
C	
D	

(iii) Explain the results for each of the following areas.

area B

area D

[2]

[Total: 10]

12 Fig. 7.1 shows a photograph of a section through a leaf.

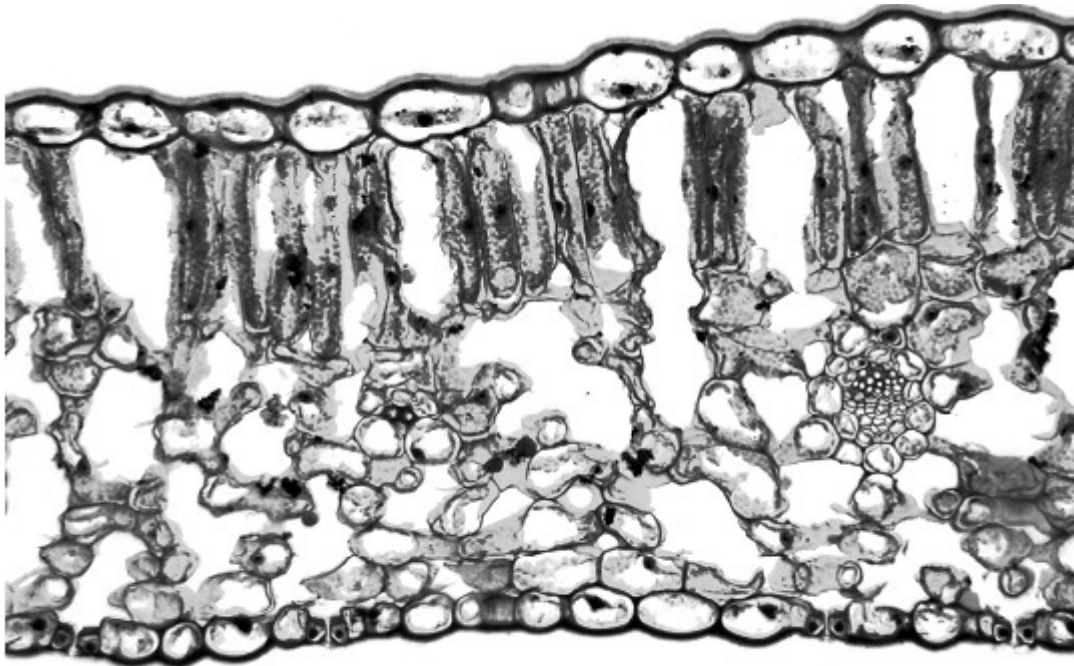


Fig. 7.1

(a) (i) Explain the functions of the cuticle of a leaf. [2]

(ii) Explain how carbon dioxide in the atmosphere passes to the cells inside the leaf. [2]

(b) The cells in the leaf use carbon dioxide to carry out photosynthesis.

State two environmental factors, apart from carbon dioxide, that can affect the rate of photosynthesis.

1.

2. [2] [Total: 6]

13 (a) Fig. 2.1 shows a partly completed diagram of a palisade cell.

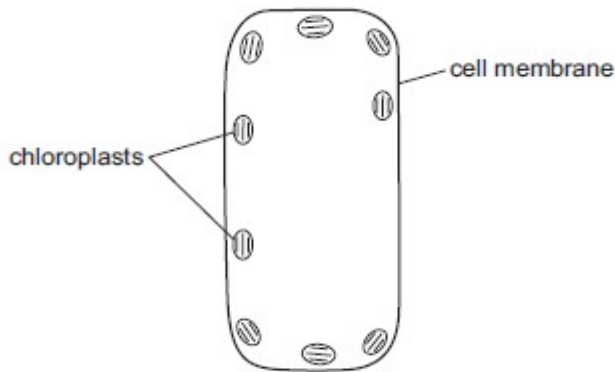


Fig. 2.1

Complete the diagram to show the other major components of this cell.

Label all the components that you have added to Fig. 2.1. [4]

(b) State precisely where palisade cells are found in a plant.[2]

[Total: 6]

14 A student set up the apparatus shown in Fig. 3.1 to investigate the effect of light intensity on the rate of photosynthesis of a pond plant.

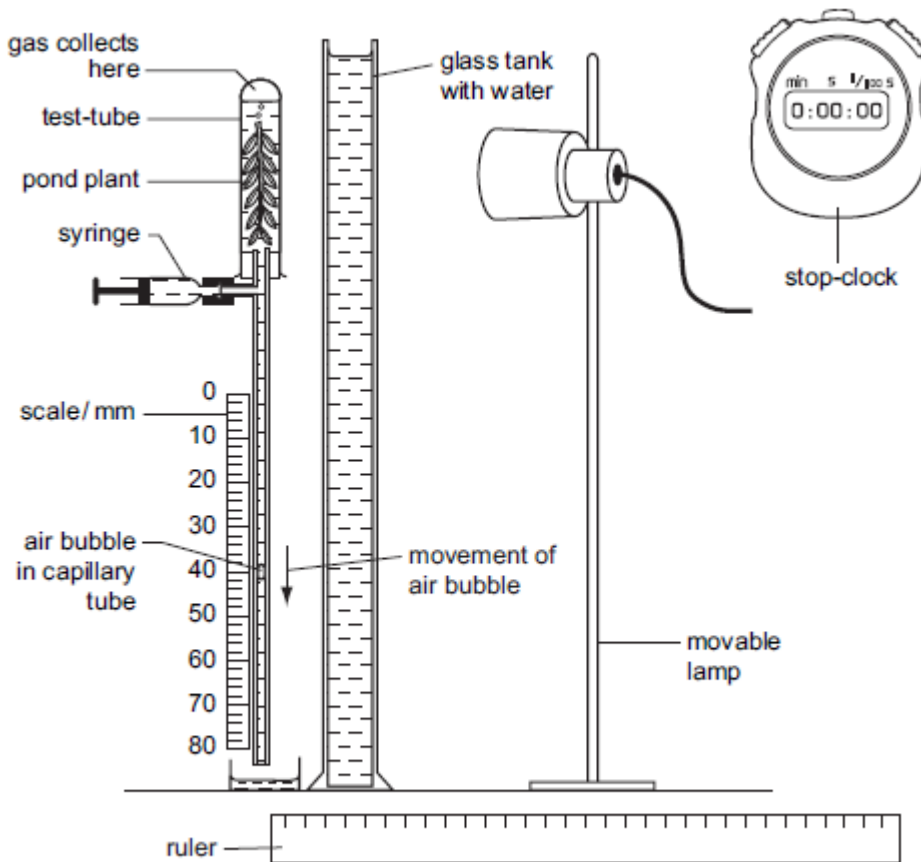


Fig. 3.1

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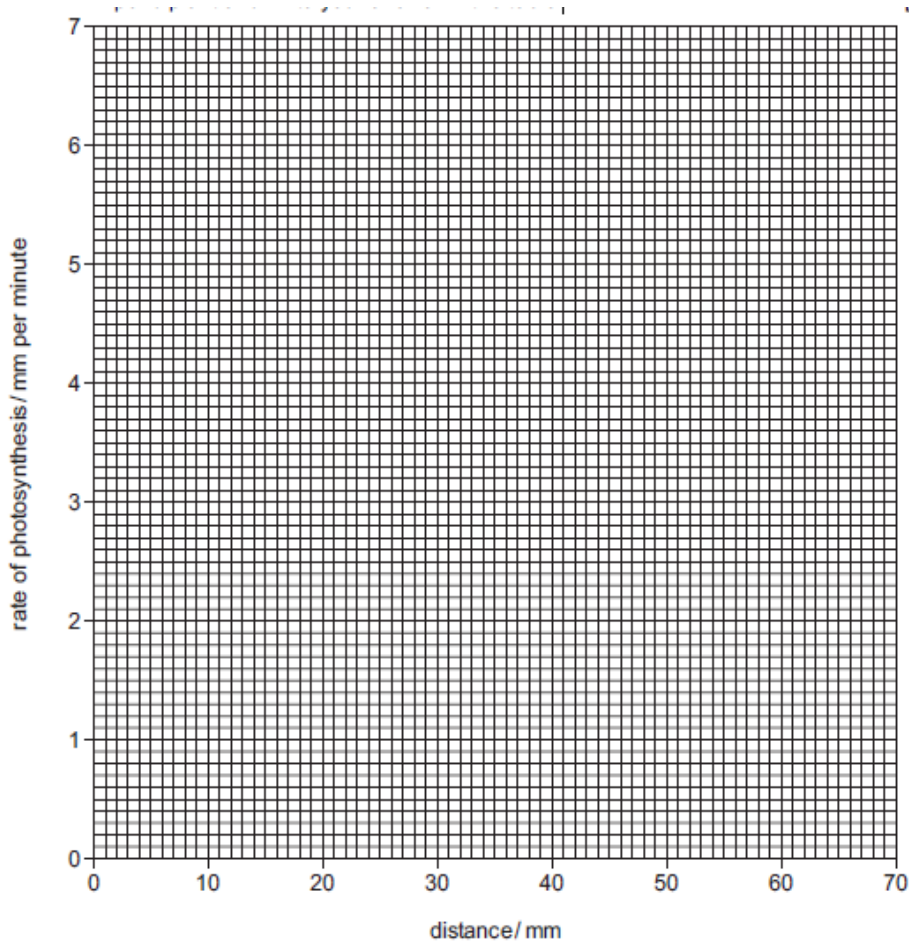
The student maintained the temperature at 20°C and measured the distance travelled by the air bubble in the capillary tube for a period of five minutes on three occasions for each light intensity. The student's results are shown in Table 3.1

- (a) (i) Explain why the student included the glass tank and the syringe in the apparatus.[2]  
 (ii) Explain why the air bubble moves down the capillary tube.[3]

**Table 3.1**

distance of lamp from pond plant / mm	distance travelled by air bubble / mm	rate of photosynthesis / mm per minute
20	30	6.0
30	26	5.2
40	14	2.8
50	7	
60	3	0.6

- (b) (i) Calculate the rate of photosynthesis when the lamp was 50 mm from the pond plant and write your answer in the table.



**Fig. 3.2**

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(ii) Plot the student's results from Table 3.1 on the axes on Fig. 3.2.

Draw an appropriate line on the graph to show the relationship between distance of the lamp from the pond plant and the rate of photosynthesis. [2]

(c) (i) Using the graph to help you, predict the results that the student would get if the lamp was positioned 15 mm and 70 mm from the pond plant.

15 mm mm per minute .

70 mm mm per minute: [2]

(ii) Explain why the rate of photosynthesis decreases as the distance of the lamp from the pond plant increases.[3]

[Total: 13]