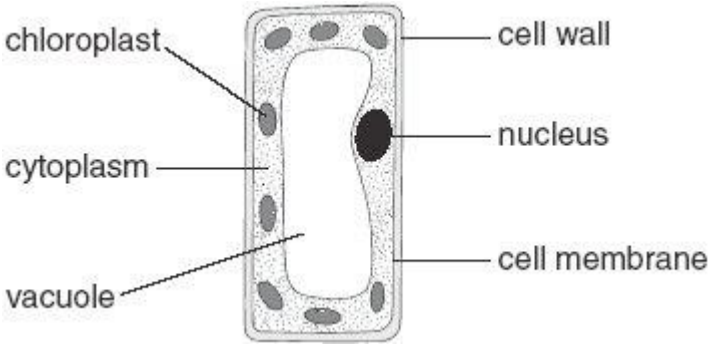
Q1.

The diagram below shows a plant cell.



(a) In which part of a plant would you find this type of cell?

.....

1 mark

(b) (i) Give the function of the nucleus.

.....

.....

1 mark

(ii) Give the function of the chloroplasts.

.....

.....

1 mark

(iii) Give the function of the cell wall.

.....

.....

1 mark

(c) Give the names of **two** labelled parts that are **not** present in animal cells.

1. .....

2. .....

2 marks

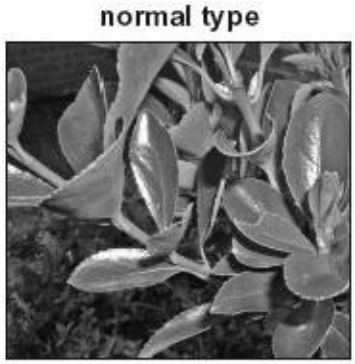
(d) Tick **one** box in each row to show whether the statement is true for photosynthesis **or** for respiration.

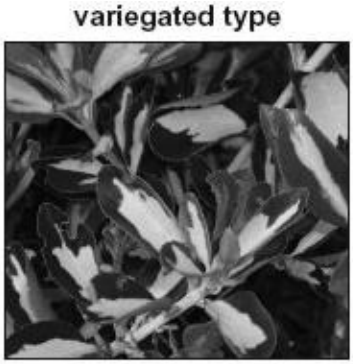
statement	photosynthesis	respiration
carbon dioxide is produced		
light is needed		
it occurs in plants and animals		
oxygen is produced		

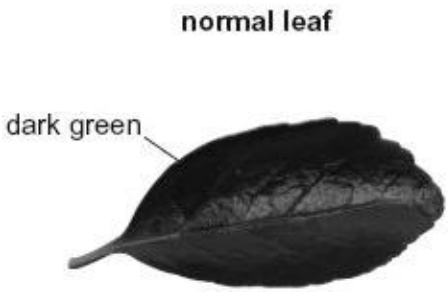
2 marks
maximum 8 marks

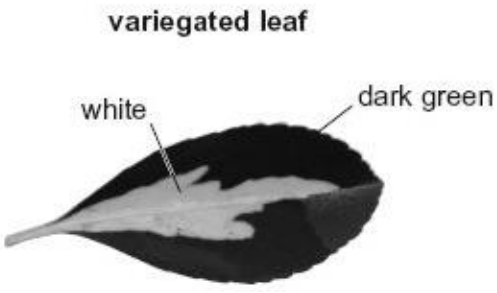
Q2.

A garden centre has two types of the same plant for sale.









Chlorophyll makes a plant leaf green.

(a) At the end of the summer, the normal plants had grown more than those with variegated leaves. All the plants had been grown in the same conditions.

(i) Explain why plants with normal leaves grow more than plants with variegated leaves.

.....

.....

.....

2 marks

(ii) Describe an investigation you could do to show how much more a normal plant grows **compared** with a variegated plant over a six-week period.

In your answer, you must clearly identify:
- the independent variable (IV)
- the dependent variable (DV)
- the variables to control (CV)
- how you will calculate the end result.

.....

.....

.....

.....

.....

.....

.....

.....

4 marks

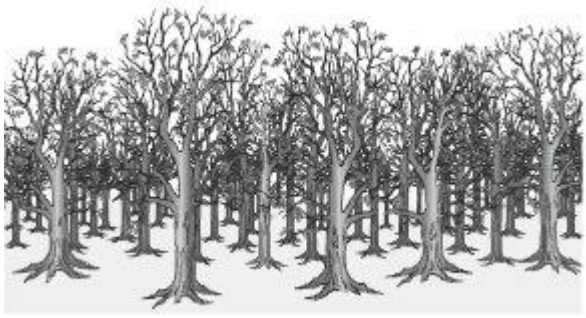
(b) What process do plants carry out in the light and in the dark to release energy? Tick the correct box.

photosynthesis	☐	respiration	☐
absorption	☐	dispersal	☐

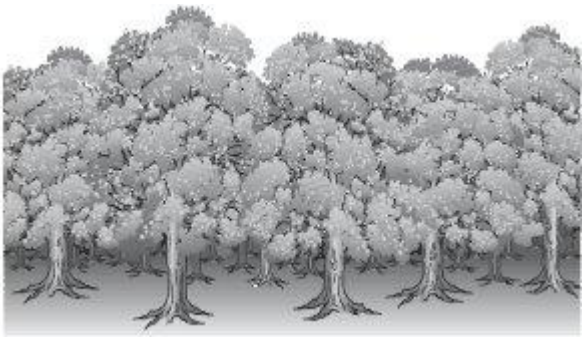
1 mark
maximum 7 marks

Q3.

The drawings below show the trees in a woodland area at the beginning of May and at the end of May.

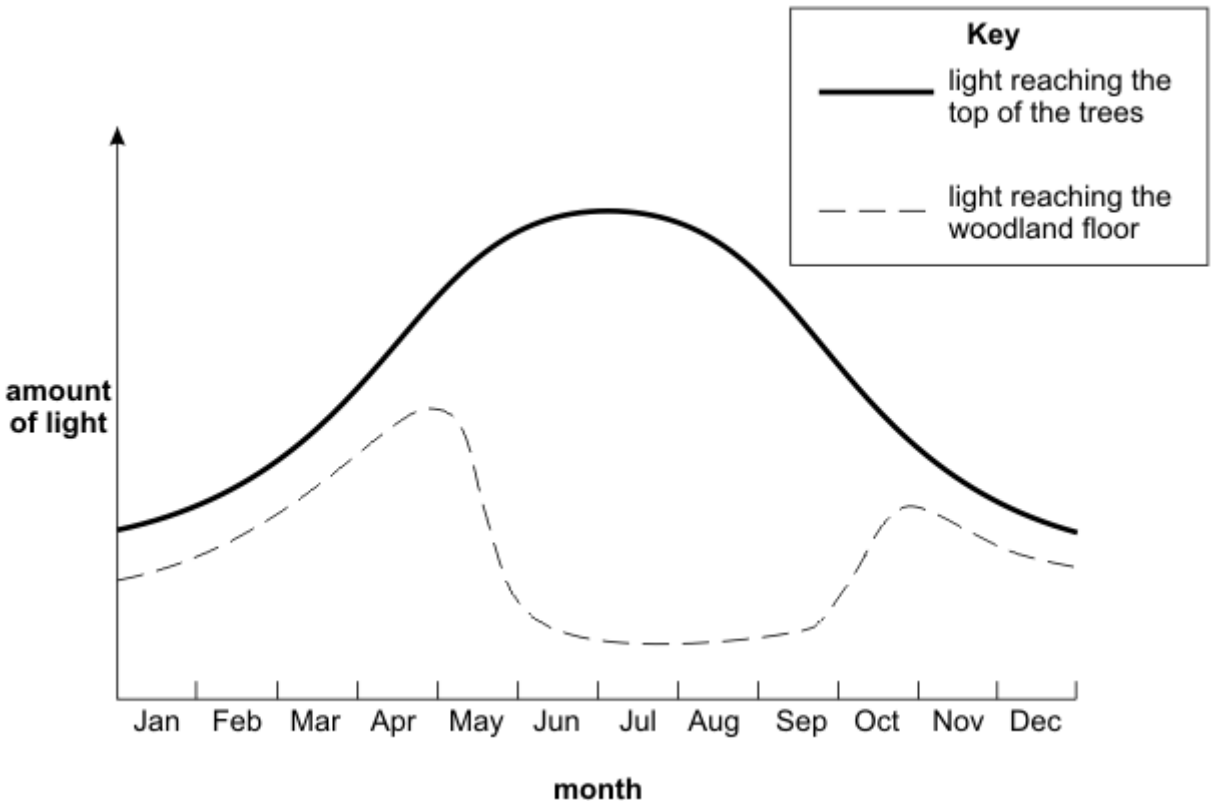


beginning of May



end of May

The graph below shows the amount of light reaching the top of the trees and the woodland floor over one year.



(a) Why does the amount of light reaching the woodland floor decrease during May?

.....

.....

1 mark

(b) Plants grow on the woodland floor.

Explain why these plants grow bigger **and** faster when there is plenty of light.

.....

.....

.....

.....

2 marks

(c) **Respiration** takes place in the cells of all plants.

Complete the word equation for **respiration**.

oxygen + ... ⟶ carbon dioxide + ...

2 marks

maximum 5 marks

Q4.

(a) Balance the following equation for photosynthesis.

..... CO_2 + ... H_2O → $C_6H_{l2}O_6$ + ... O_2

(1)

(b) Give **two** conditions necessary for photosynthesis apart from a suitable temperature range and the availability of water and carbon dioxide.

1. .....

2. .....

(2)

(a) Plants have leaves which contain guard cells and palisade cells. Explain how **each** of these kinds of cell assists photosynthesis.

Guard cells .....

.....

.....

.....

(2)

Palisade cells .....

.....

.....

.....

(2)

(d) Glucose is a product of photosynthesis. Give **three** uses which green plants make of glucose.

1. .....

2. .....

3. .....

(3)

(Total 10 marks)

Q5.

Richard wanted to find out the best conditions for growing lettuce plants.

He took 4 trays and planted 8 lettuce plants in each.
The results of his investigation are shown below.

	variables			
tray	**light level**	**air temperature (°C)**	**soil moisture**	**number of plants alive after 7 days**
A	medium	25	moist	8
B	medium	25	dry	6
C	medium	45	moist	2
D	medium	45	dry	0

(a) How many days did Richard's investigation last?
Use the table to help you.

..... days

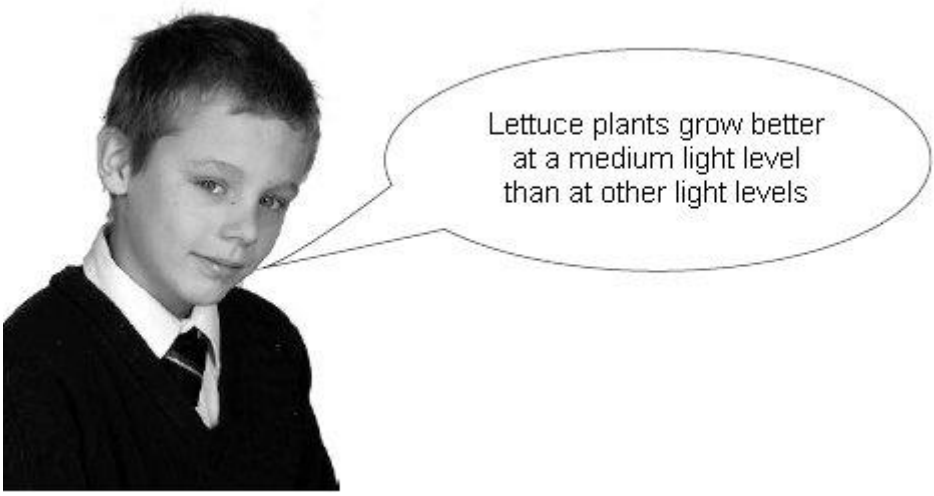
1 mark

(b) Look at the table. Which variables did Richard **change** in his investigation?
Tick the correct box.

light level and air temperature	☐	soil moisture and type of soil	☐
air temperature and soil moisture	☐	type of soil and light level	☐

1 mark

(c) Richard said:



Why is Richard **not** able to make this conclusion from his investigation?

.....

.....

1 mark

(d) The table below shows the number of lettuce plants alive at the end of day 1 and day 7 of the investigation.

For each tray, A, B, C and D, suggest the number of plants that were alive on **day 4**. Write your answers in the table below.

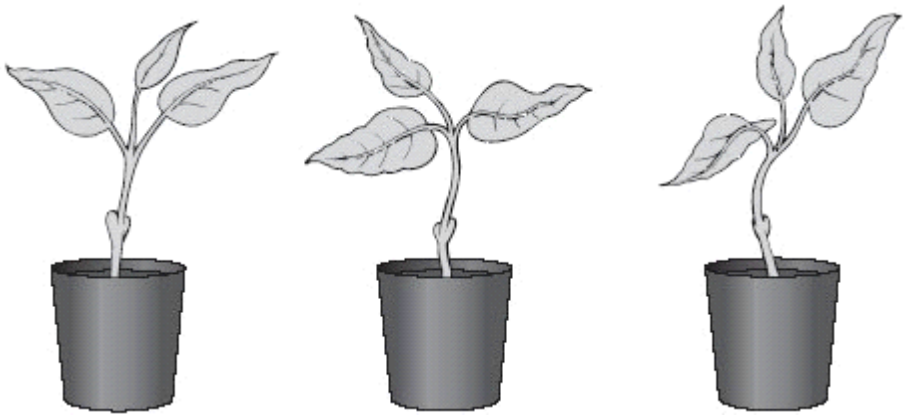
	number of plants alive		
tray	**day 1**	**day 4**	**day 7**
A	8		8
B	8		6
C	8		2
D	4		0

2 marks

maximum 5 marks

Q6.

The drawings below show three healthy young plants.



A **B** **C**

The drawings below show the three plants after two weeks.

A **B** **C**

(a) (i) Plant B did **not** have enough light.

How can you tell this from the drawing?

.....

.....

1 mark

(ii) Plant C did **not** have enough water.

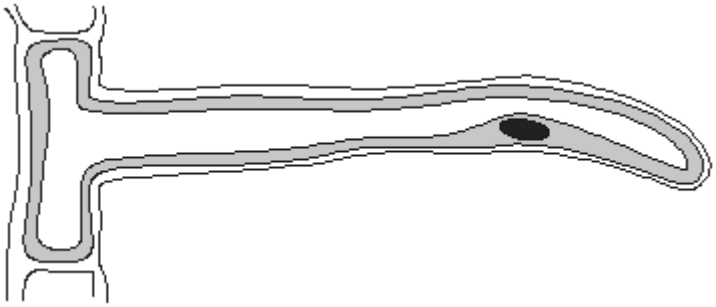
How can you tell this from the drawing?

.....

.....

1 mark

(b) The drawing below shows a root hair cell.



Give **two** substances that root hair cells absorb from the soil.

1. .....

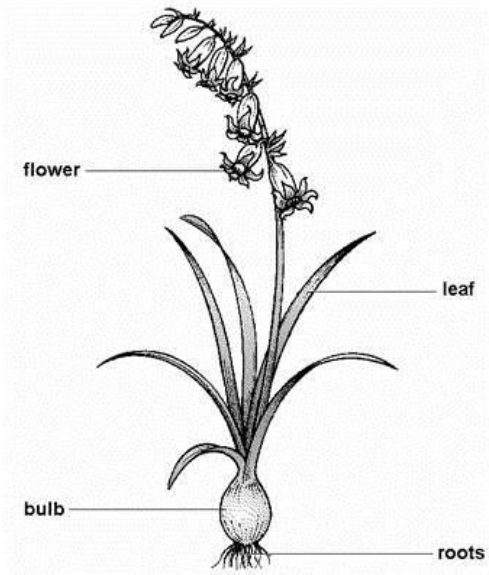
1 mark

2. .....

1 mark
maximum 4 marks

Q7.

The drawing shows a bluebell plant. The plant grows from an underground stem called a bulb.
Each year new leaves and flowers grow from the bulb.



(a) Describe the process by which glucose is made in the leaves.

.....

.....

.....

.....

.....

3 marks

(b) Many plants make starch from glucose.
What group of nutrients do both glucose and starch belong to?

.....

1 mark

(c) In the sixteenth century bluebell bulbs were dug up to obtain a starch-like substance that was used to make collars stiff.

(i) Digging up bluebell bulbs has caused a decrease in the number of bluebells growing in Britain.
It is now against the law to dig up bluebells.

Suggest **one** other environmental reason why the number of bluebell plants has decreased in Britain.

.....

.....

1 mark

(ii) Every 10 years the trees and bushes in some bluebell woods are cut down to ground level.

What effect does this have on the number of bluebells in the woods?
Explain your answer.

.....

.....

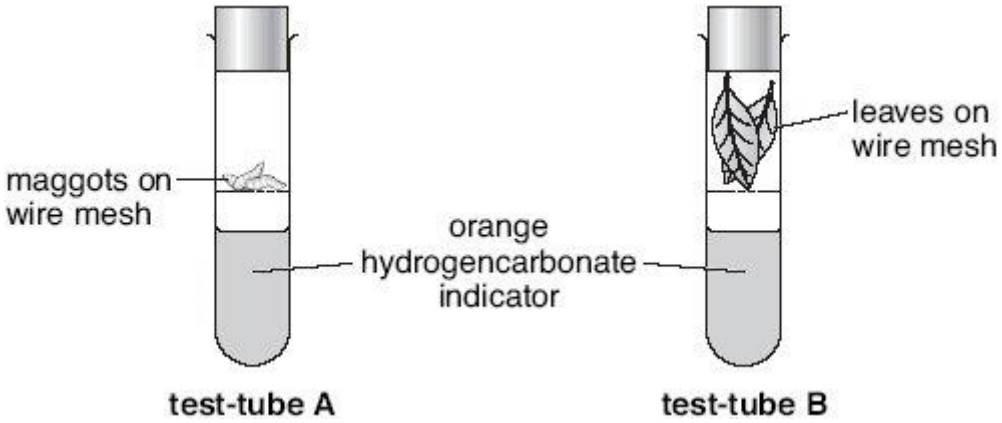
1 mark
Maximum 6 marks

Q8.

The table shows how hydrogencarbonate indicator solution changes colour when the concentration of carbon dioxide in it changes.

concentration of carbon dioxide	colour change
increases	orange to yellow
decreases	orange to purple

Sunil set up the experiment shown below and put both test-tubes on a window-sill.



Use information in the table to help you answer the questions below.

(a) The indicator in test-tube A changed from orange to yellow.

(i) What process, in the cells of the maggots, caused this colour change?

.....

1 mark

(ii) Explain what happens in this process to cause the colour change.

.....

1 mark

(b) The indicator in test-tube B changed from orange to purple.

(i) What process, in the cells of the leaves, caused this colour change?

.....

1 mark

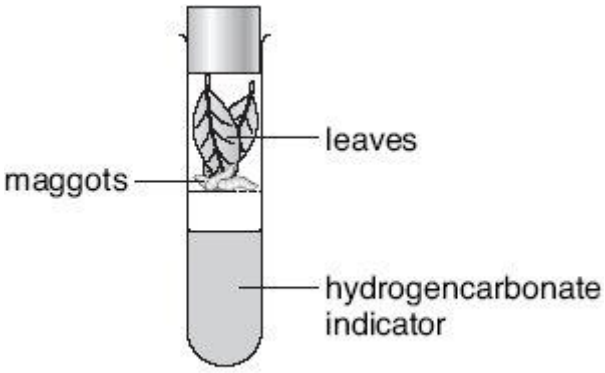
(ii) Explain what happens in this process to cause the colour change.

.....

.....

1 mark

(c) Sunil then put two fresh leaves into test-tube C containing 30 cm^3 of orange hydrogencarbonate indicator.
He added some maggots on a piece of wire mesh as shown below.
He put the test-tube on a window-sill.



test-tube C

The indicator remained orange. Explain why.

.....

.....

.....

1 mark
maximum 5 marks