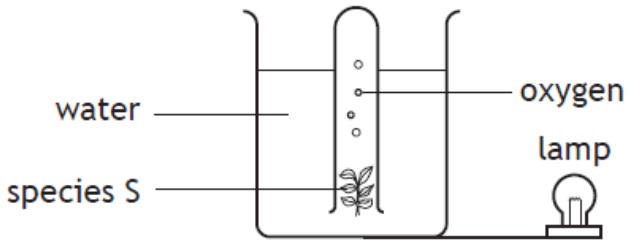
Unit 3 Life on Earth Revision Questions

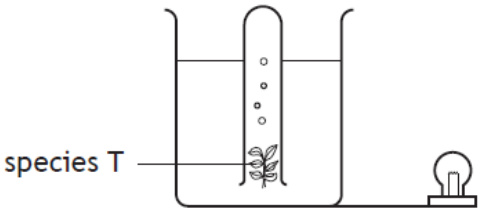
Key Area 3 Photosynthesis

1. An investigation was carried out to compare the rate of oxygen gas production by two different species of water plant, S and T.

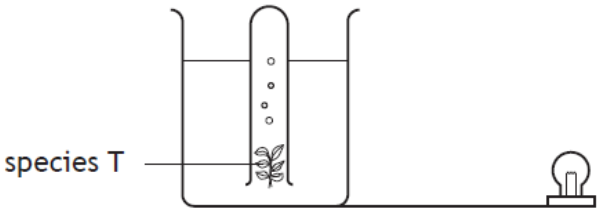


Which diagram below shows the set-up for species T, that would allow a valid comparison in the rate of oxygen production of the two species?

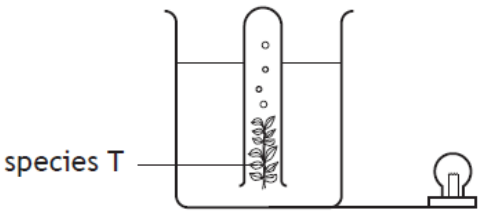
A



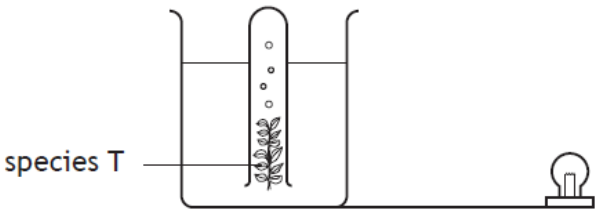
C



B

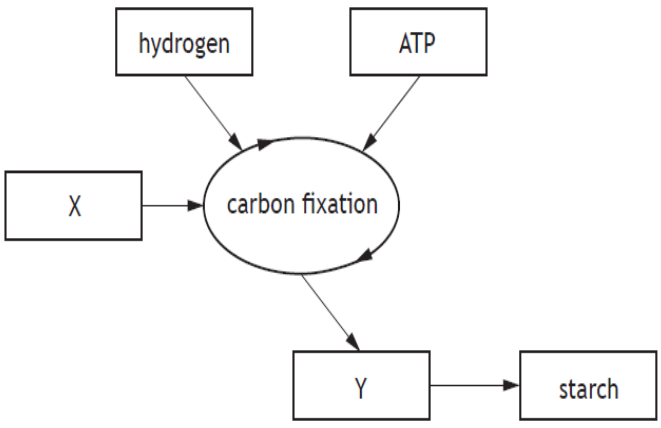


D



2.

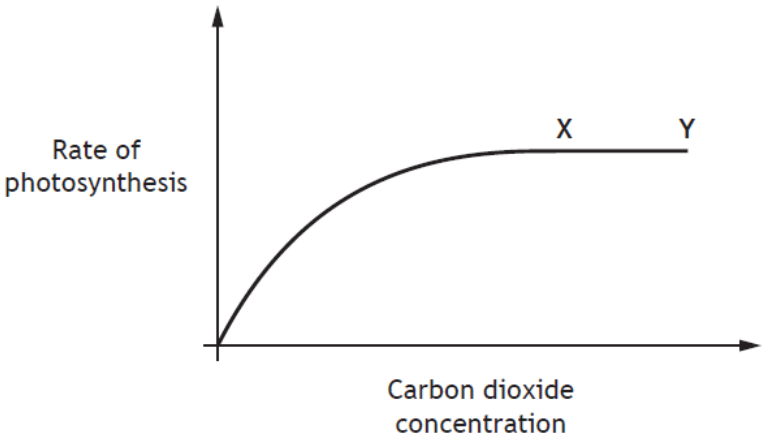
The diagram below shows the carbon fixation stage of photosynthesis.



Which row in the table below identifies X and Y?

	X	*Y*
A	Sugar	Oxygen
B	Water	Carbon dioxide
C	Carbon dioxide	Sugar
D	Water	Oxygen

3. The graph shows the effect of increasing carbon dioxide concentration on the rate of photosynthesis.



Two factors which could be limiting the rate of photosynthesis between points X and Y on the graph are

A starch concentration and light intensity

B temperature and light intensity

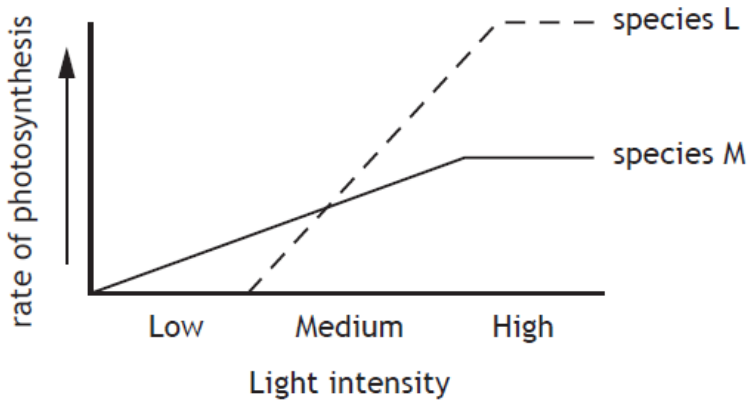
C temperature and carbon dioxide concentration

D sugar concentration and carbon dioxide concentration.

4.

The effect of light intensity on the rate of photosynthesis was measured for two species of plants, L and M.

The results are shown in the graph below.



The rate of photosynthesis of species M is

A slower than L in low light intensities

B slower than L in high light intensities

C faster than L in medium light intensities

D faster than L in high light intensities.

5. The light energy for photosynthesis is captured by

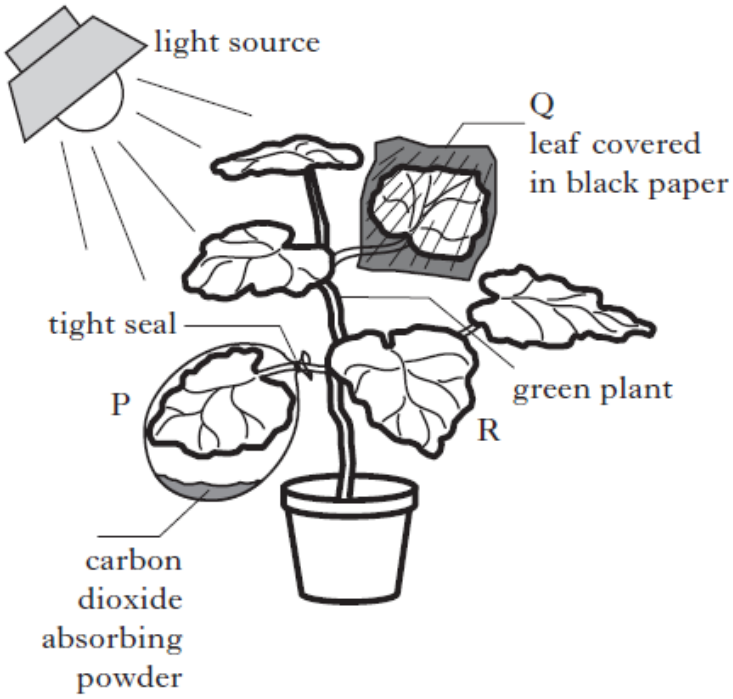
A water

B hydrogen

C chlorophyll

D oxygen.

6. The diagram below shows an investigation into photosynthesis.



Which of the following statements is correct?

A P, Q and R make food

B P and Q make food

C Only Q makes food

D Only R makes food

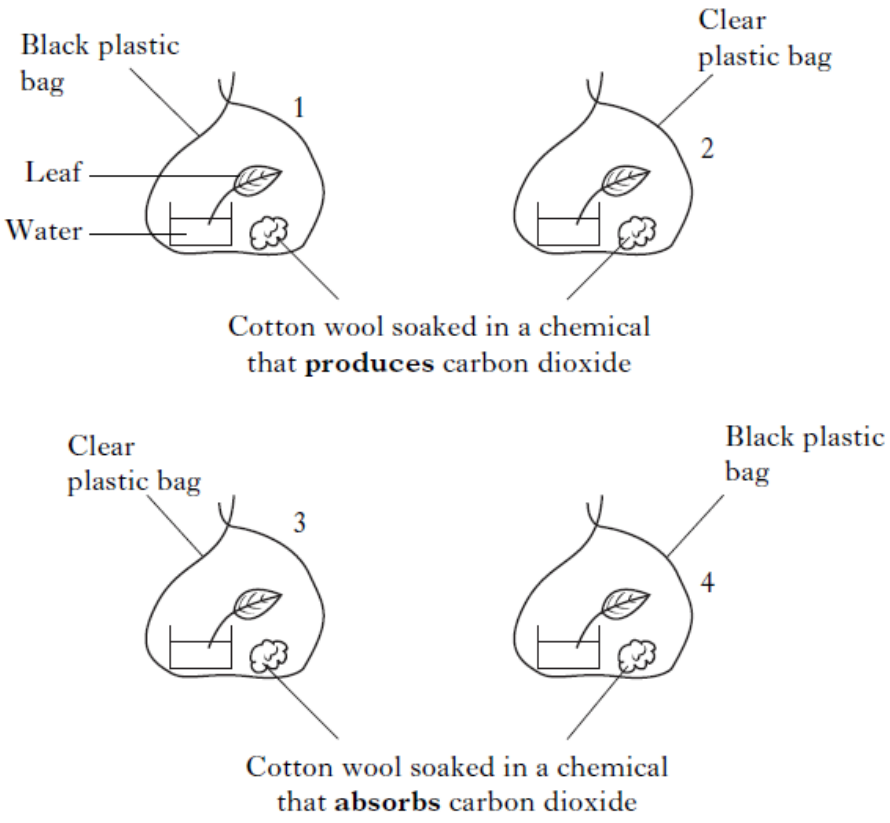
7. Glucose produced during photosynthesis may be converted into starch or cellulose.

Which line in the table below correctly identifies the use of starch and cellulose?

	Use of carbohydrate	
	Starch	*Cellulose*
A	structural	structural
B	structural	storage
C	storage	structural
D	storage	storage

8.

The diagrams below show four experiments used in an investigation into the conditions needed for photosynthesis.



The results from which two experiments should be compared to show that light is needed for photosynthesis?

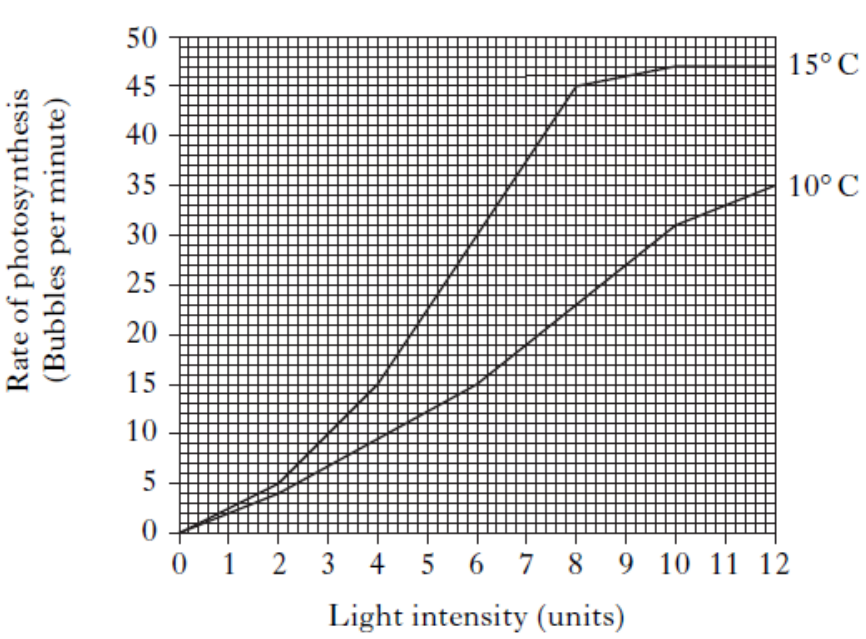
A 1 and 2

B 1 and 4

C 2 and 3

D 3 and 4

9. The graph below shows the rate of photosynthesis, as light intensity increases, at 2 different temperatures.



At a light intensity of 6 units, what is the simplest whole number ratio of the rate of photosynthesis at 10°C compared to 15°C?

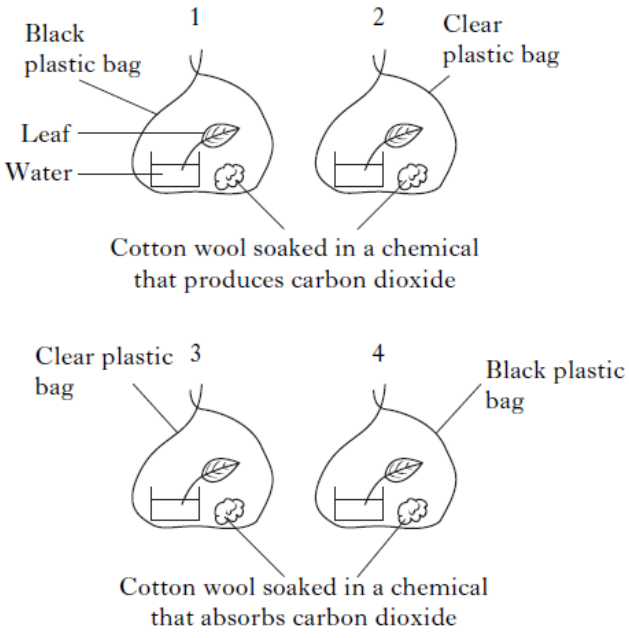
A 15 : 30

B 10 : 15

C 3 : 6

D 1 : 2

10. The diagrams below show 4 experiments used to investigate the conditions needed for photosynthesis.



After two days, the four leaves were tested for the presence of starch.

The results from which two experiments should be compared to show that carbon dioxide is needed for photosynthesis?

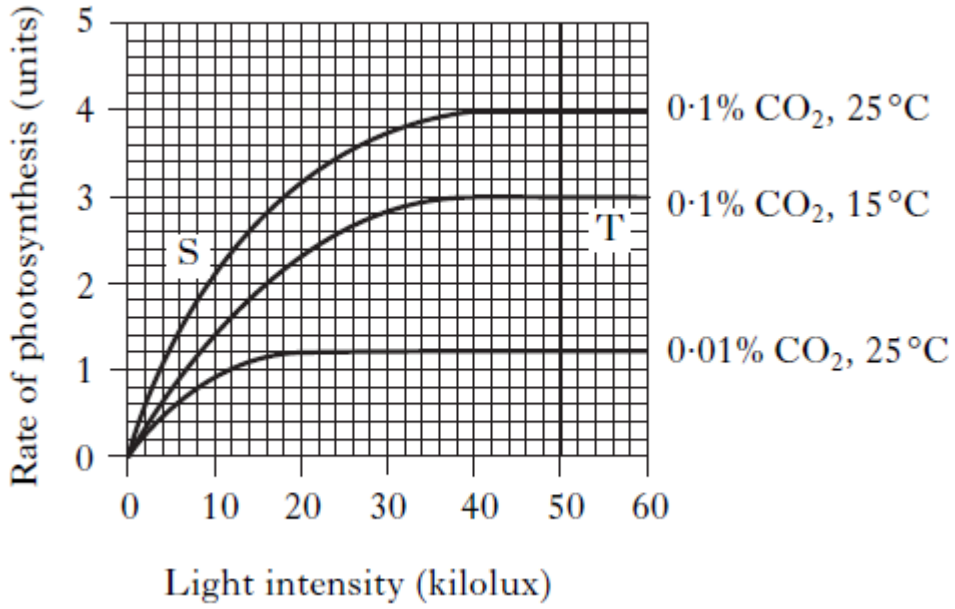
A 1 and 2

B 2 and 4

C 2 and 3

D 3 and 4

11. The graph shows the effect of varying the light intensity, temperature and carbon dioxide concentration on the rate of photosynthesis.



The rate of photosynthesis is being limited by

A temperature at S and light intensity at T

B light intensity at S and temperature at T

C carbon dioxide at S and temperature at T

D light intensity at S and carbon dioxide at T.

12. The raw materials for photosynthesis are

A carbon dioxide and water

B oxygen and water

C carbon dioxide and glucose

D oxygen and glucose.

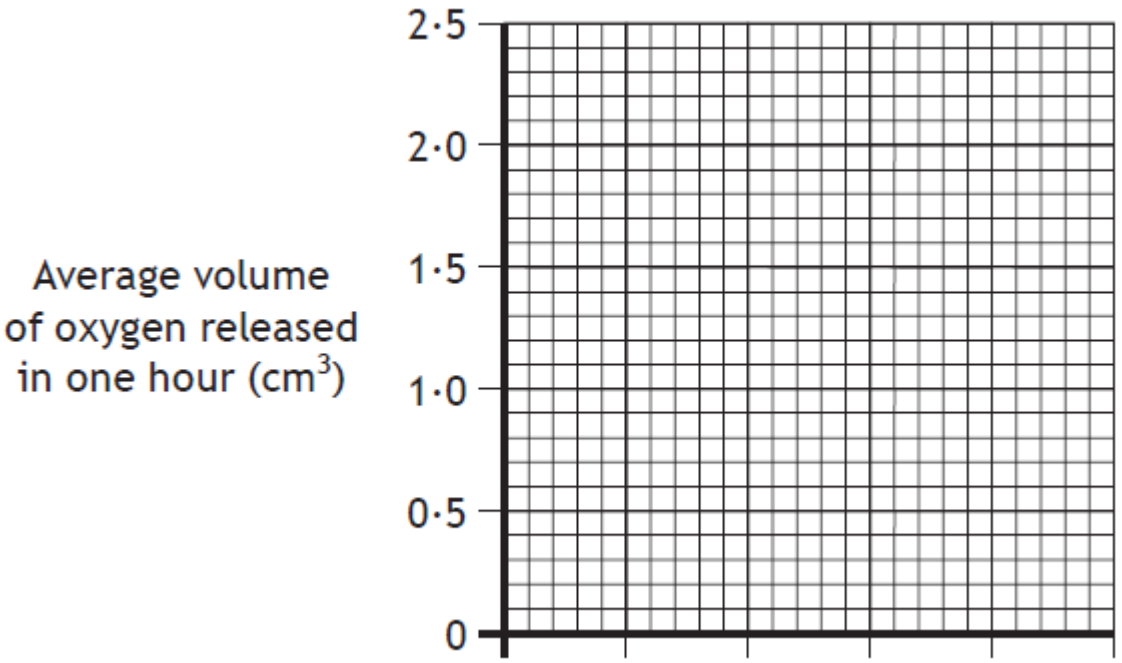
13.

A student set up an investigation into the effect of temperature on the rate of photosynthesis in a green plant, by measuring the volume of oxygen released in one hour.

The results are shown in the table.

Temperature (°C)	*Volume of oxygen released in one hour* (cm^3)		
	Experiment 1	*Experiment 2*	*Average*
10	0·7	0·5	0·6
20	1·6	1·4	1·5
30	2·7	1·9	2·3
40	2·0	2·6	2·3
50	0·3	0·5	0·4

(a) On the grid, plot a line graph to show the effect of temperature on the average volume of oxygen released in one hour. **2**



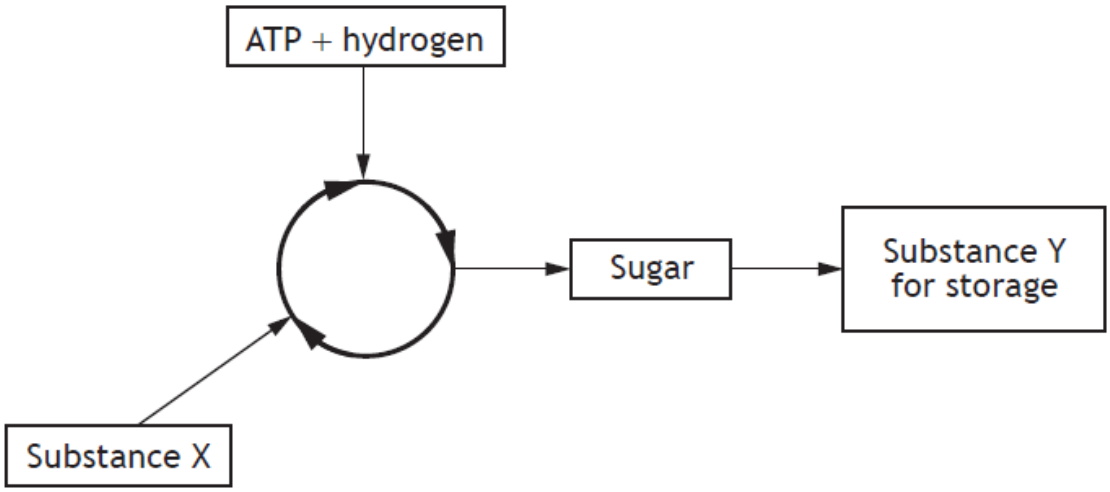
(b) Predict the average volume of oxygen released in one hour if the experiment was carried out at a temperature of 60 °C. **1**

_____ cm^3

(c) State one factor, other than temperature, which can limit the rate of photosynthesis. **1**

_____

(d) The diagram represents the second stage of photosynthesis.



Name substances X and Y. **2**

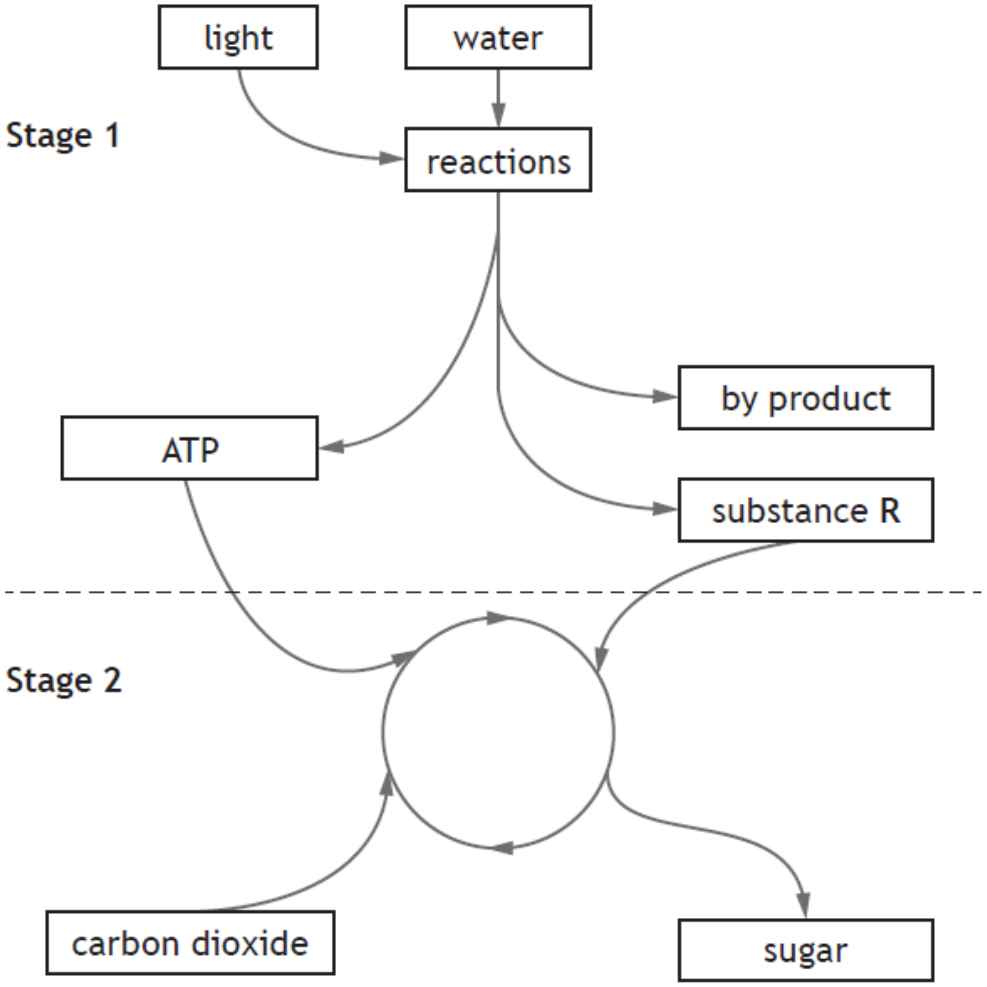
X _____

Y _____

14.

(a) Photosynthesis is the process by which plants produce sugar using light.

The flow diagram represents some stages of photosynthesis in a leaf.



(i) Identify substance R. 1

(ii) Describe the transfer of energy in stage 1 from light arriving at the leaf, and how the sugar produced in stage 2 can be used by the plant. 3

15.

Photosynthesis is a two stage process used by green plants to produce food.

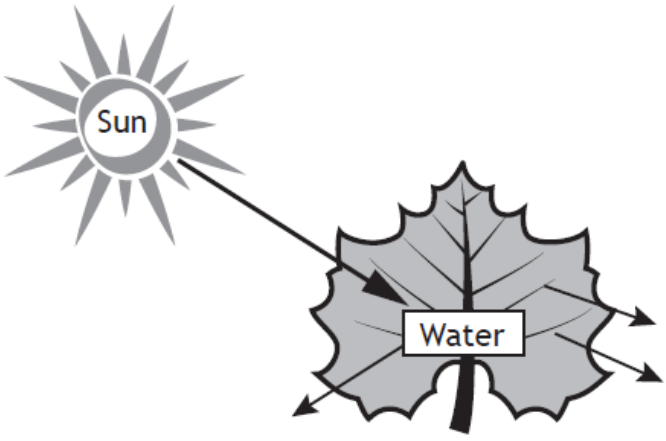
(a) The diagram below represents a summary of the first stage of photosynthesis.

Complete the diagram by filling in the three boxes, selecting terms from the list in the box below. 3

ATP	carbon dioxide		carbon fixation
sugar	hydrogen	oxygen	light reactions

Name of the first stage

_____



Two products used in second stage.

1. _____

2. _____

Diffuses out of the leaf

_____

(b) Describe the second stage of photosynthesis. 2

16.

Photosynthesis is a two stage process.

Stage 1 — Light reactions

Stage 2 — Carbon fixation

(a) The table below shows some statements about photosynthesis.

Complete the table to show which stage each statement refers to by placing a tick (✓) in the Stage 1 or Stage 2 box.

The first two statements have been completed for you. **2**

Statement	*Stage 1*	*Stage 2*
Carbon dioxide required		✓
Light energy required	✓	
Water required		
Sugar produced		
ATP + Hydrogen required		
Oxygen produced		

(b) Explain why high temperatures (above 50°C) would prevent the photosynthesis reactions from taking place. **2**