Unit 1 Plants

1.1 What do plants need for photosynthesis?

This exercise relates to **1.1 Photosynthesis** from the Coursebook.

In this exercise, you practise making conclusions from results.

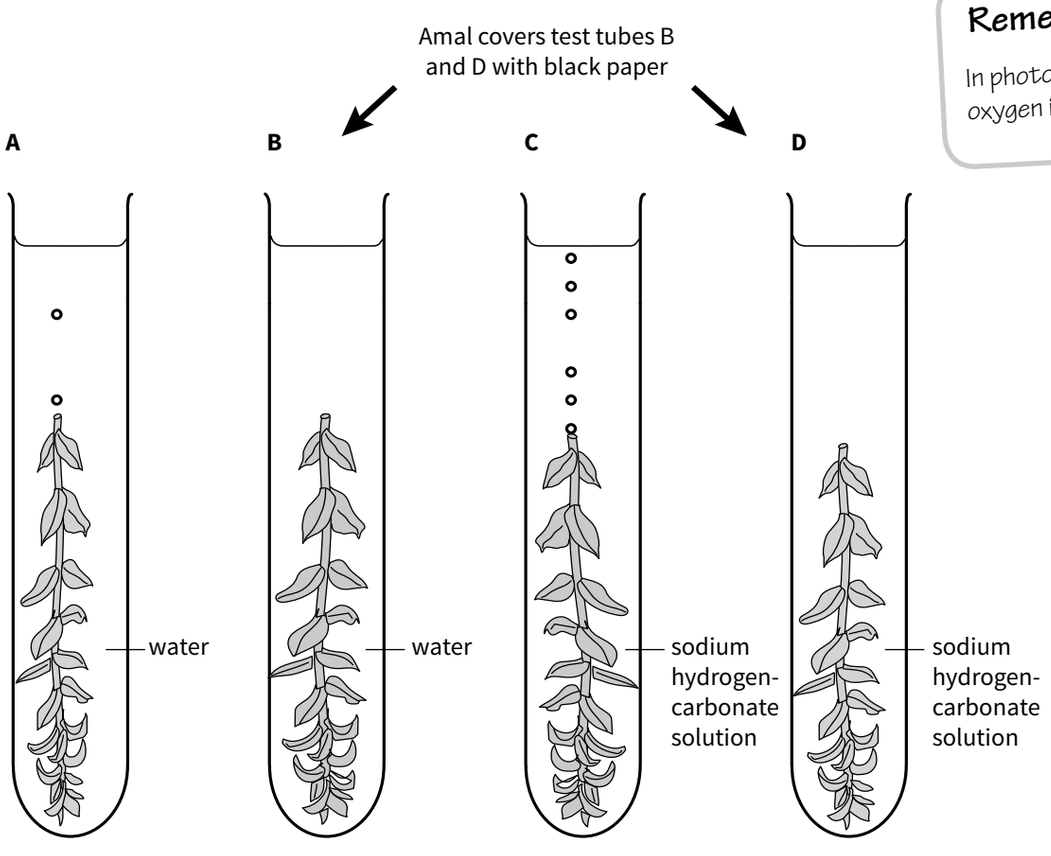
Amal puts some aquatic plants (water plants) into different liquids.

One of the liquids is sodium hydrogencarbonate solution. This provides carbon dioxide.

Amal looks to see which plants give off bubbles.

Remember

In photosynthesis, oxygen is given off.



1 In which test tubes do the plants have light? .....

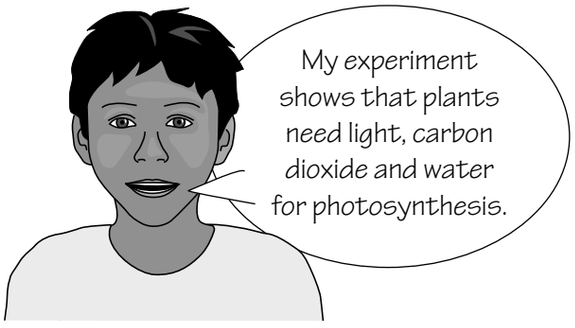
2 In which test tubes do the plants have extra carbon dioxide? .....

3 In which test tubes do the plants have water? .....

Amal makes a conclusion from his experiment.

Amal's teacher says: 'You are correct that plants need those three things for photosynthesis.

But your experiment only gives you information about two of them.'



4 Explain how Amal's results show that light is needed for photosynthesis.

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5 Explain how Amal's results show that carbon dioxide is needed for photosynthesis.

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6 Explain why Amal's results do **not** show whether plants need water for photosynthesis.

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Remember

A conclusion uses **only** the results of the experiment, not other facts that you know.

7 Suggest what Amal could do to test whether water is needed for photosynthesis.

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8 Complete the word equation for photosynthesis.

[ ] + water ⟶ [ ] + [ ]

1.2 Duckweed experiment

This exercise relates to **1.2 Mineral salts for plants** from the Coursebook.

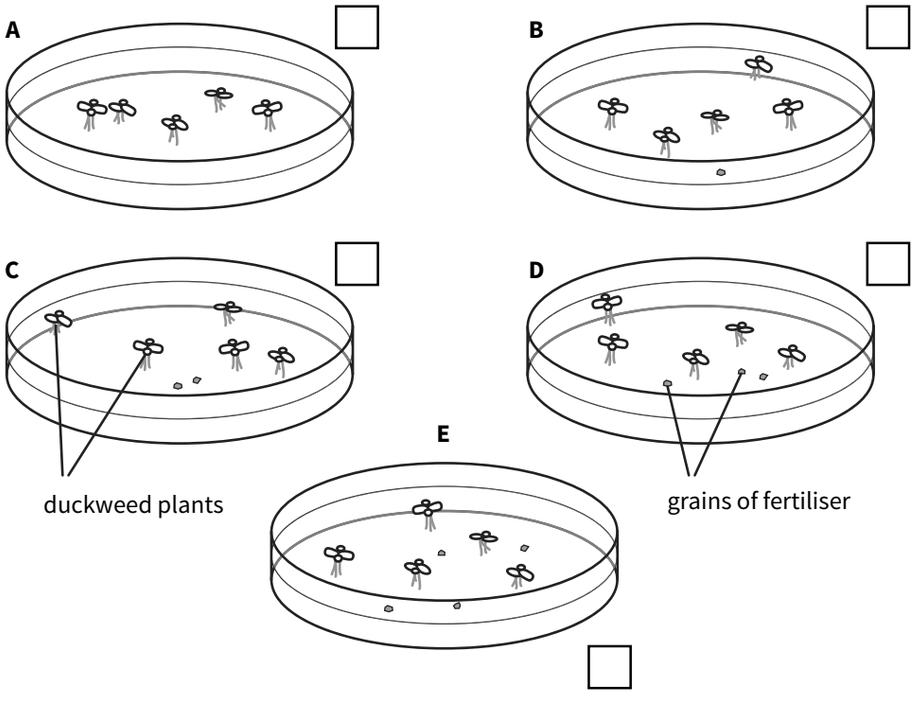
In this exercise, you practise planning experiments, recording results and making conclusions.

Anna does an experiment to find out if extra nitrate fertiliser helps duckweed plants to grow faster.

She takes five dishes and puts distilled water into them. She labels the dishes **A**, **B**, **C**, **D** and **E**.

She adds one grain of fertiliser to dish **B**, two grains to dish **C**, three grains to dish **D** and four grains to dish **E**.

She puts five duckweed plants into **each** dish.



1 Write the number of grains of fertiliser that Anna puts into each dish in the boxes next to each diagram.

2 Which variable does Anna change in her experiment?
Tick the correct answer.

number of duckweed plants ☐ volume of water ☐ quantity of fertiliser ☐

3 Which variables should Anna keep the same in her experiment?
Tick **all** the correct answers.

number of duckweed plants ☐ quantity of fertiliser ☐ light intensity ☐

volume of water ☐ temperature ☐

After two weeks, Anna counts the number of duckweed plants in each dish.

She writes the results in her notebook.

4 Complete the results chart.

Dish	Number of grains of fertiliser	Number of plants at end of experiment
A	0	5
B		
C		
D		
E		

A 5 plants

B 9 plants

C 10 plants

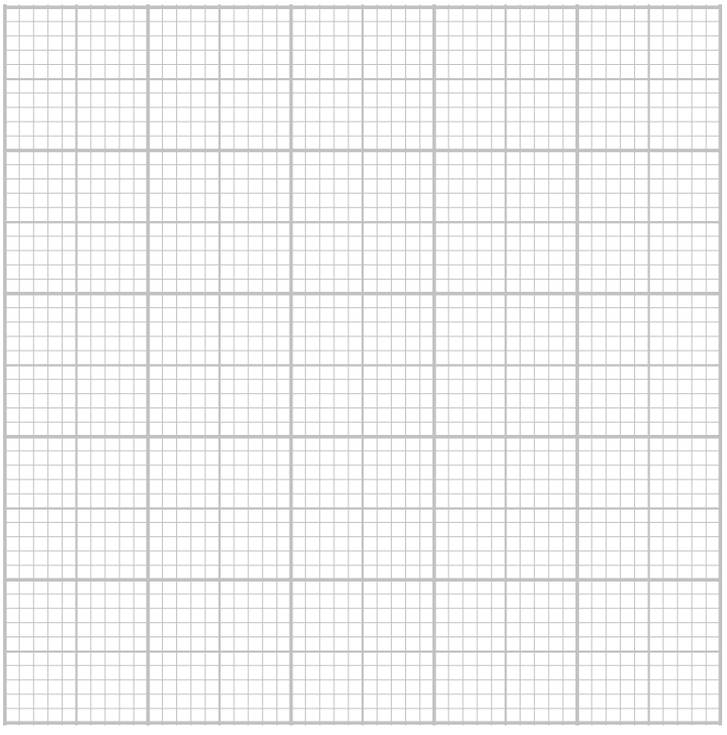
D 8 plants

E no plants

5 Draw a bar chart to display Anna's results.

Put 'number of grains of fertiliser' on the *x*-axis.

Put 'number of plants at end of experiment' on the *y*-axis.



Anna says:

6 Explain how Anna's results support her conclusion.

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7 How can Anna improve her experiment?
Tick the correct answer.

Use three sets of dishes for each quantity of fertiliser. ☐

Use a different kind of water plant in each dish. ☐

Put each dish in a different temperature. ☐

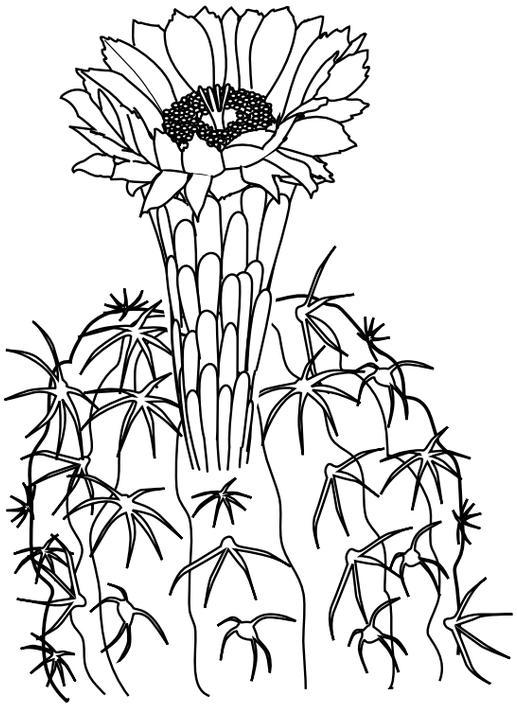
1.3 Saguaro cactus pollination

This exercise relates to **1.5 Pollination** from the Coursebook.

In this exercise, you practise finding information in a written passage and using it to answer questions. You also need to use your own knowledge and understanding of pollination.

The saguaro cactus grows in the desert in Arizona, USA. It produces many white flowers at the ends of the branches on its tall stems.

In the cooler times of the year, some of the flowers open each night. Each flower is about 8 cm wide. Its petals form a tube about 10 cm long. There is sweet nectar at the bottom of the tube.



At night, bats are attracted by the sweet smell of the flowers and the shining white petals.

The bats have long tongues. These can reach down to the bottom of the tube, where the nectar is. The bats' heads brush against the anthers. Pollen grains stick to the bats' hair.

When a bat flies to another cactus flower, some of the pollen grains stick to the stigma. The flower has been pollinated.

Each open flower closes the next day, and never opens again.

1 List **two** features of the saguaro flowers that attract bats.

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2 Suggest why the flowers are produced high up, at the tips of the cactus stems.

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3 Explain how the structure of the flower makes sure that the bats get pollen on their hair.

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4 Suggest why not all of the cactus flowers open on the same night.

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5 Pollen grains contain the male gametes of the flowers. Explain how the bats help the saguaro flowers to reproduce. Use these words in your answer:

pollinate **sexual reproduction**

fertilise **male gametes** **female gametes**

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1.4 Adaptations of fruits for dispersal

This exercise relates to **1.7 Fruits** from the Coursebook.

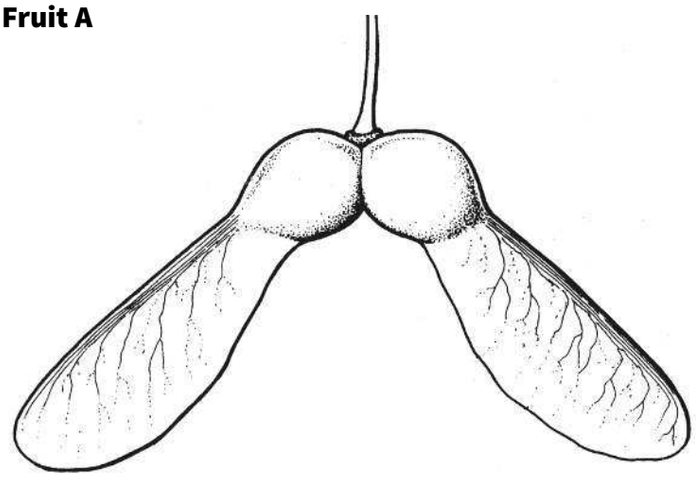
In this exercise, you practise explaining your ideas.

Fruits contain seeds.

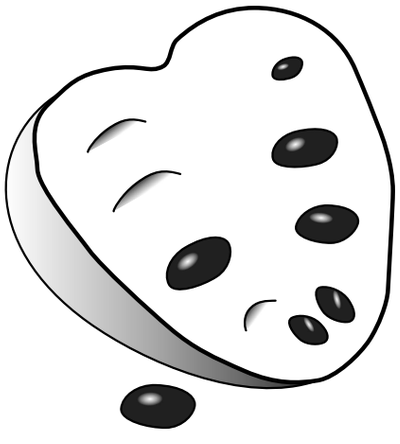
Fruits have adaptations that help their seeds to be carried far away from the parent plant. This is called dispersal.

The drawings show three different fruits. Two of them are dispersed by animals. One of them is dispersed by the wind.

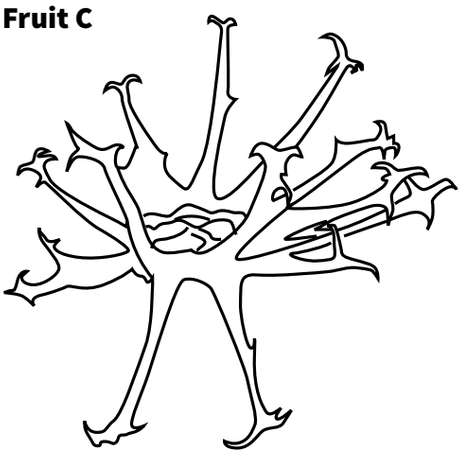
Fruit A



Fruit B



Fruit C



Remember

Study the drawings and think carefully before you write each answer.

1 How is fruit **A** dispersed?
Draw a circle around the correct answer.

by animals / by the wind

Explain your answer.

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2 How is fruit **B** dispersed?
Draw a circle around the correct answer.

by animals / by the wind

Explain your answer.

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3 How is fruit **C** dispersed?
Draw a circle around the correct answer.

by animals / by the wind

Explain your answer.

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4 Explain why it is useful for fruits to be dispersed far away from the parent plant.

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