

Specification points to cover:

the reactants in, and products of, photosynthesis, and a word summary for photosynthesis

Key teaching points:

Label plant organs – basic function

Draw a leaf and think what needs to go in and out of the leaf – label oxygen, CO₂, water and light

Word equation for photosynthesis (symbol for stretch) – Word roots for ‘photo’ and ‘synth’

Piece of extended writing (or bullet points) explaining the photosynthesis equation – where it happens, what is needed, raw materials, how taken in, useful product and waste product.

Demo or video/simulation of pondweed and light investigation – how does this prove that light is needed for photosynthesis?

Stretch – think of variables (IV, DV, CVs)

Skills points to cover:

How to set out a word equation

Pondweed practical can be unreliable, Reading university has a good simulation

<https://www.reading.ac.uk/virtualexperiments/ves/preload-r-photosynthesis-full.html>

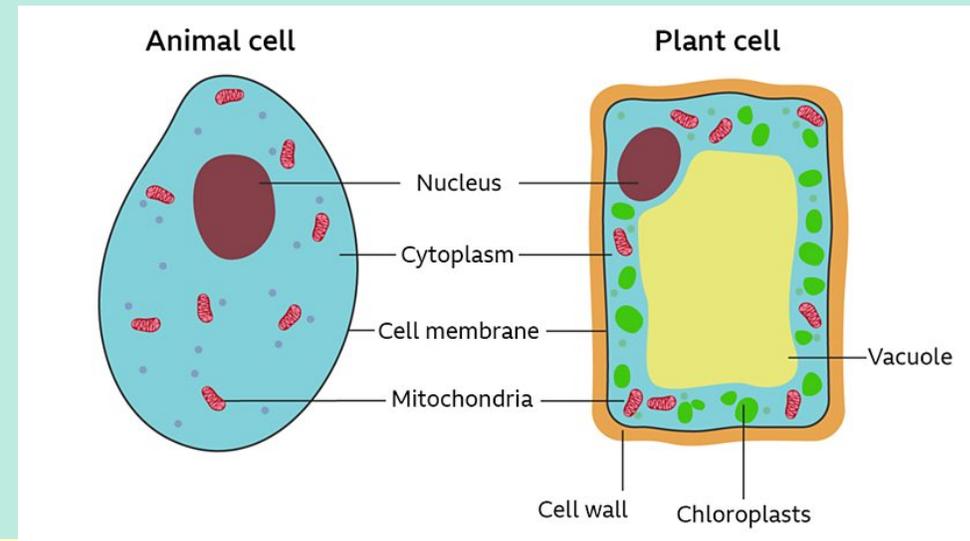
Title: Photosynthesis

Date: 19/11/2020

Underline
date and
title!

DO NOW:

1. What do the mitochondria do?
2. What does the cell wall do?
3. What does the nucleus do?



B
E
P
R
O
U
D

Challenge: 3. What does the vacuole do?



Learning Intent

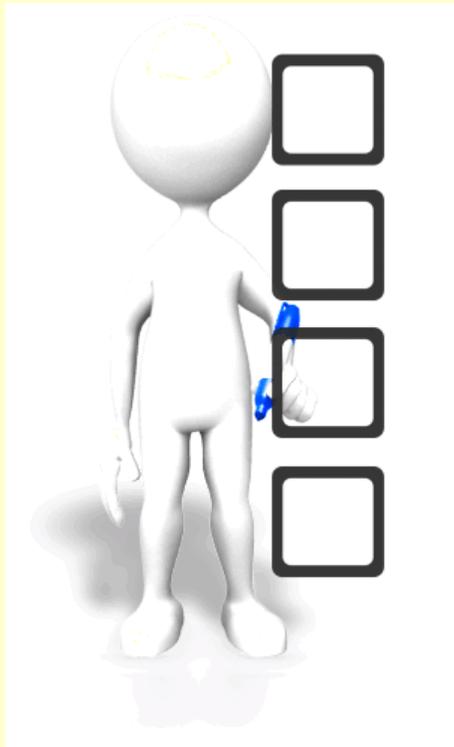
What is photosynthesis and where does it happen in plants?

Success Criteria

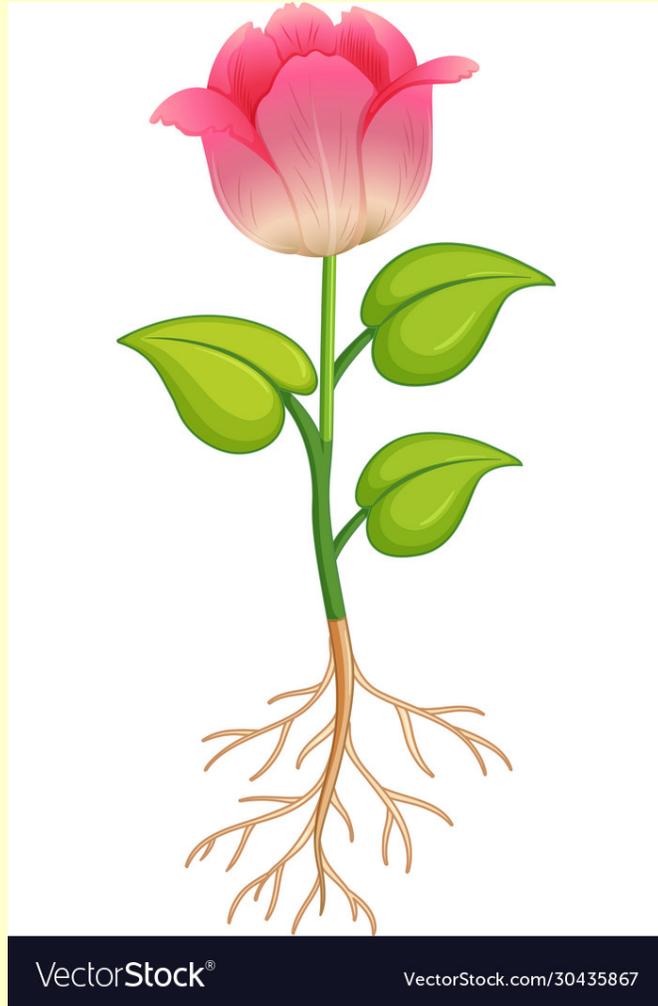
Say where photosynthesis happens in a plant cell

Describe the process of photosynthesis

Explain how we can prove that plants need light for photosynthesis



Draw a plant and label the key parts



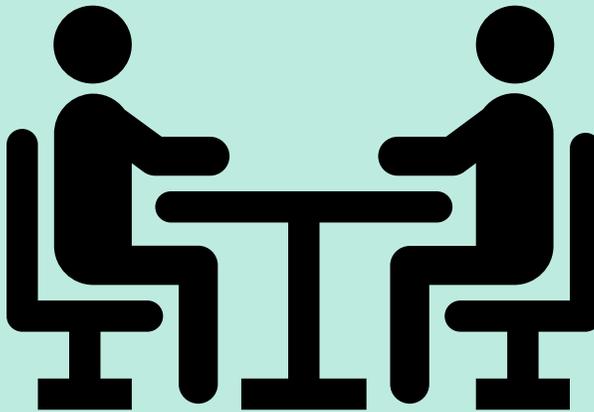
- Roots
- Leaves
- The stem
- Flower

What do you think each part does?

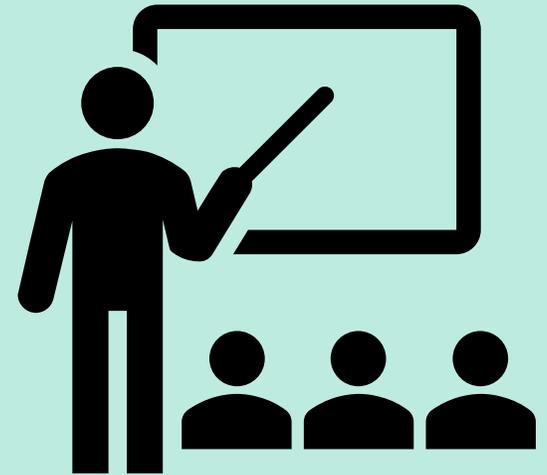
Success criteria:



Think for 1 minute in silence.



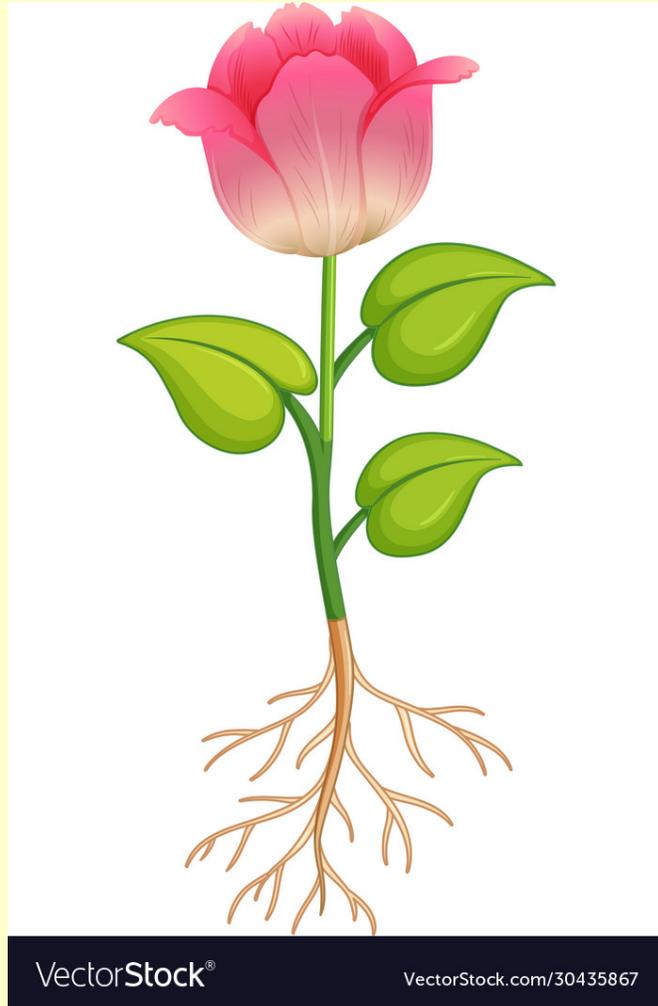
Work as a pair to discuss your ideas.



Share your ideas with the class

Keywords:

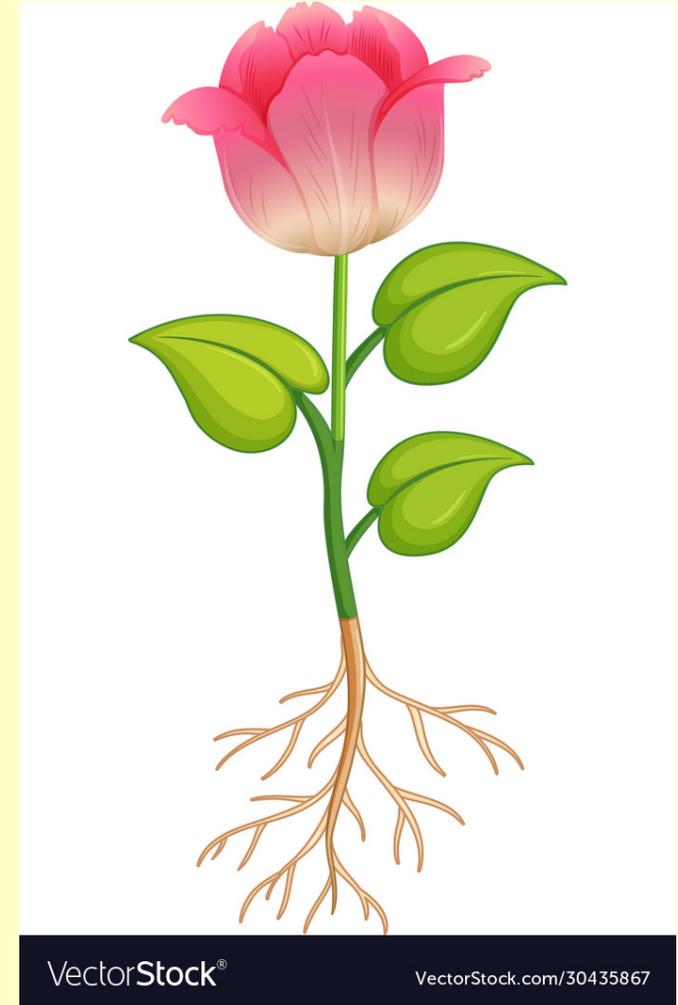
Roots



Roots keep a plant in the ground. They also take in water and nutrients from the soil.

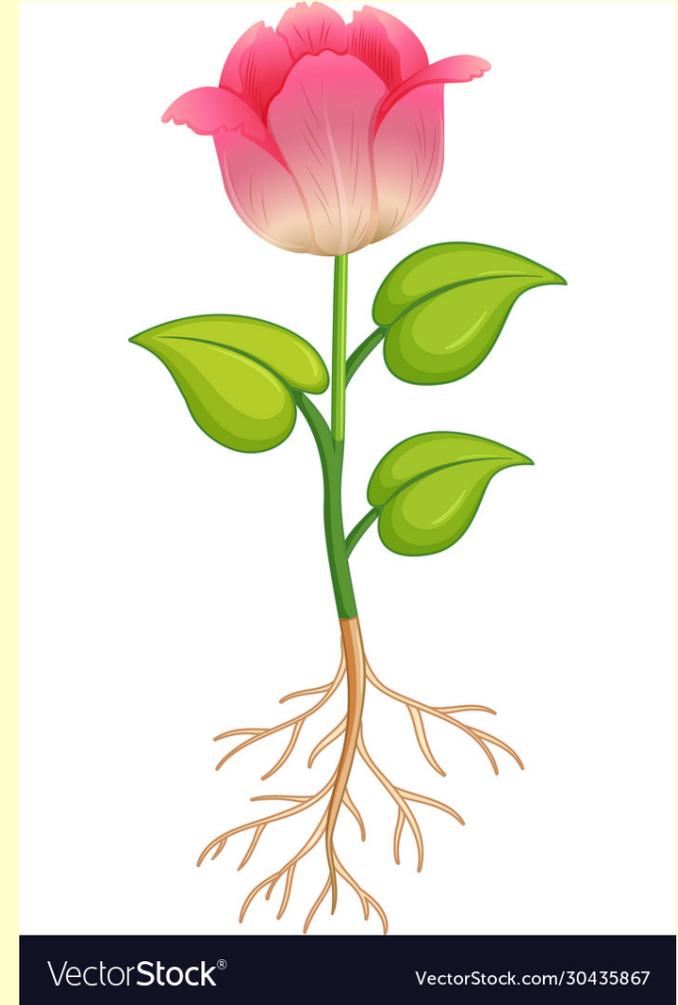
Leaves

Leaves take in sunlight to make their own food.
They also have little holes in the bottom to let oxygen out.



Stem

The stem holds the plant up. It also transports water and food from the roots upwards.

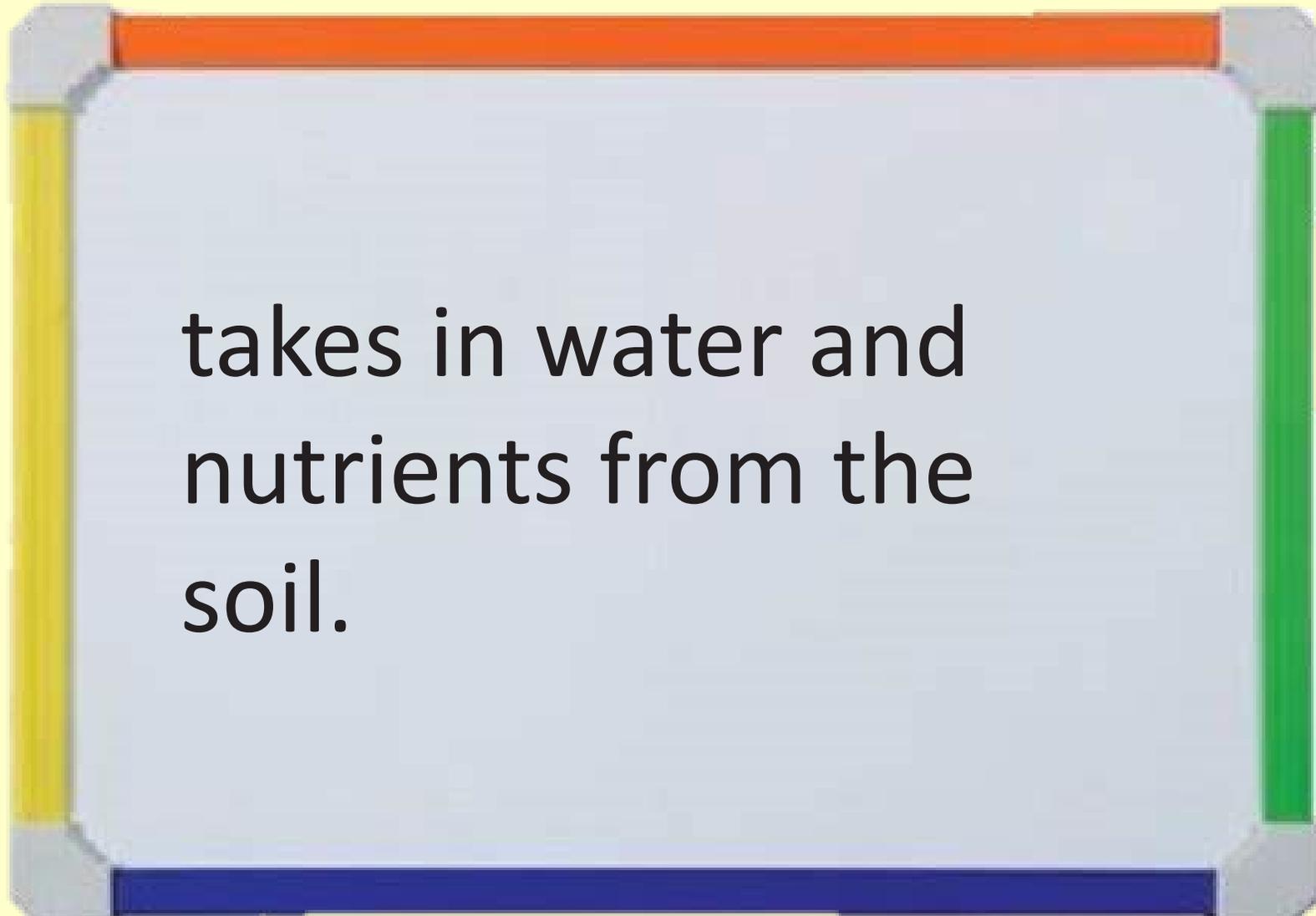


Flowers

Flowers are used to make new plants.



Which part...



takes in water and
nutrients from the
soil.

3

2

1

Hold up
your
whiteboard!

Which part...



3

2

1

Hold up
your
whiteboard!

Which part...



3

2

1

Hold up
your
whiteboard!

Which part...



3

2

1

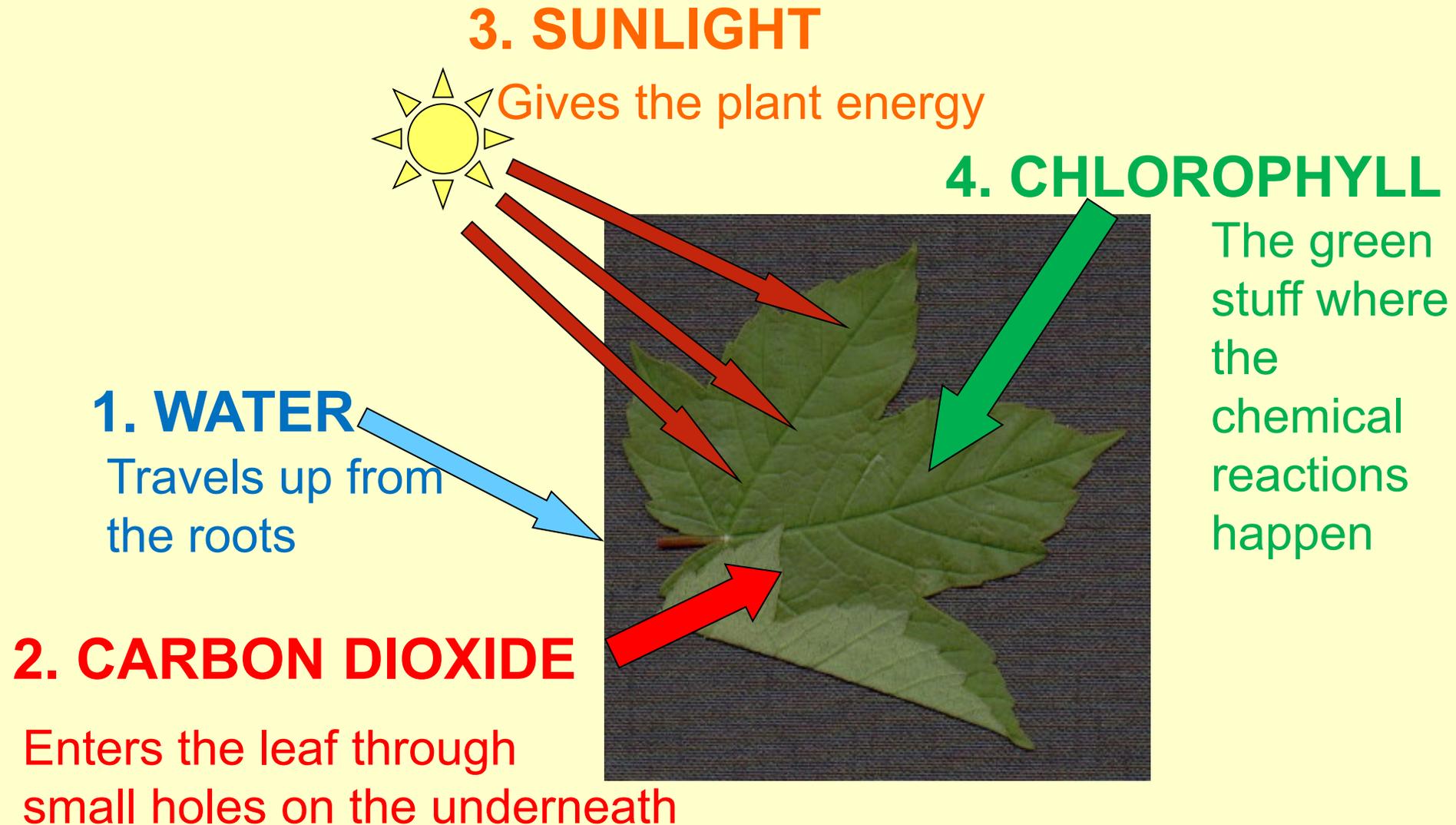
Hold up
your
whiteboard!

Draw a leaf

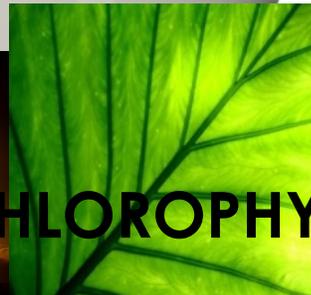


0:30

Photosynthesis happens in the palisade cells of a leaf.



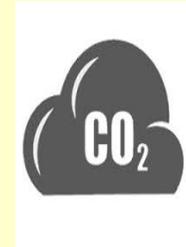
A plant making food by photosynthesis is a bit like cooking.
They take some things mix them together and make something else!



CHLOROPHYLL

Activity: Using your knowledge of photosynthesis add in the correct details into the table below

EXT: Make an equation for photosynthesis



| Raw materials (what we start with) | Things we need... | Products (what we end with) |
|--|----------------------|-----------------------------------|
| | | |
| | | |

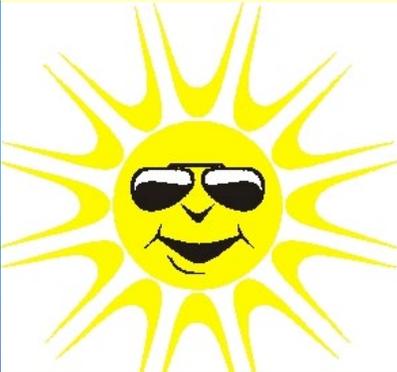
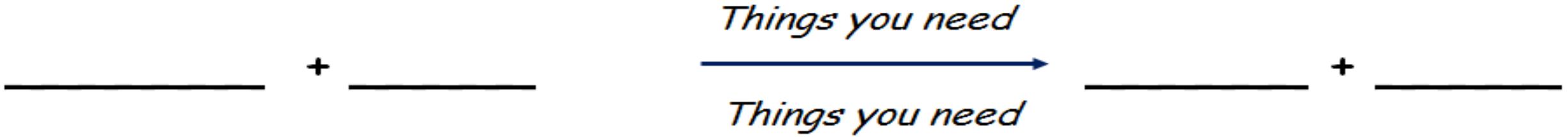


Plants convert carbon dioxide and water into glucose and oxygen.

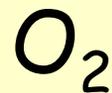
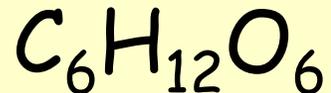
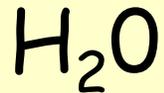
The glucose is stored as starch in the cells on the plant

| Raw materials (what we start with) | Things we need... | Products (what we end with) |
|---------------------------------------|-------------------|--------------------------------|
| Carbon dioxide (CO_2) | Sunlight | Glucose ($C_6H_{12}O_6$) |
| Water (H_2O) | Chlorophyll | Oxygen (O_2) |

TASK: Use the pictures to write out the equation for photosynthesis
It should look like this below.



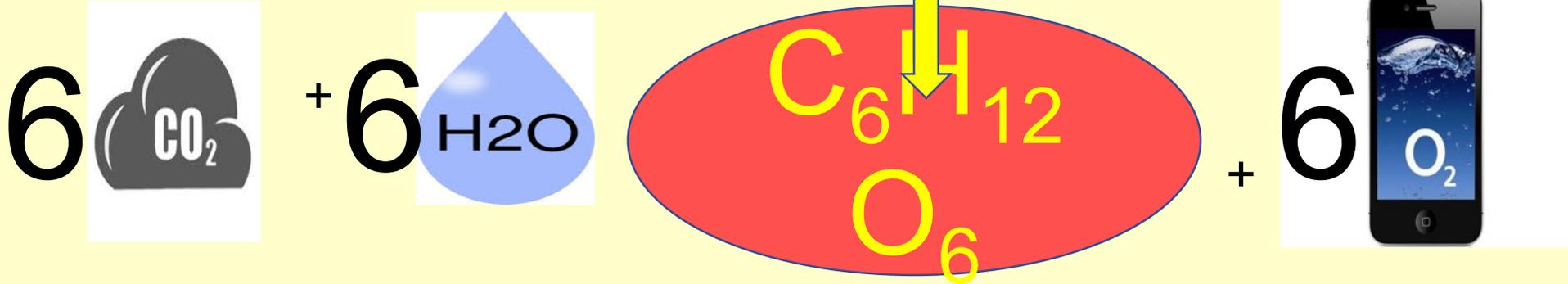
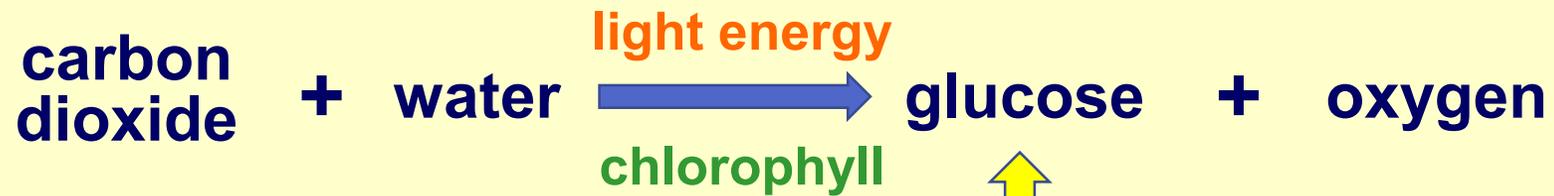
EXT: Can you match the symbol to the substances of photosynthesis?



Review

Reactants

Products



We can balance the equation by putting in numbers before the symbols
Remember this equation

Product , Reactant or something we need?

PRODUCT

REACTANT

SOMETHING
WE NEED

Product , Reactant or something we need?

Carbon dioxide

PRODUCT

REACTANT

SOMETHING
WE NEED

Product , Reactant or something we need?

Oxygen

PRODUCT

REACTANT

SOMETHING
WE NEED

Product , Reactant or something we need?

Sunlight

PRODUCT

REACTANT

SOMETHING
WE NEED

Product , Reactant or something we need?

Water

PRODUCT

REACTANT

SOMETHING
WE NEED

Product , Reactant or something we need?

Glucose

PRODUCT

REACTANT

SOMETHING
WE NEED

Product , Reactant or something we need?

Chlorophyll

PRODUCT

REACTANT

SOMETHING
WE NEED

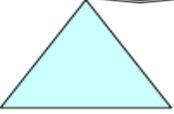
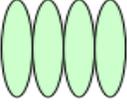
Activity: 1. Carefully read the information on your sheet

2. Answer the questions

How do plants make food ?

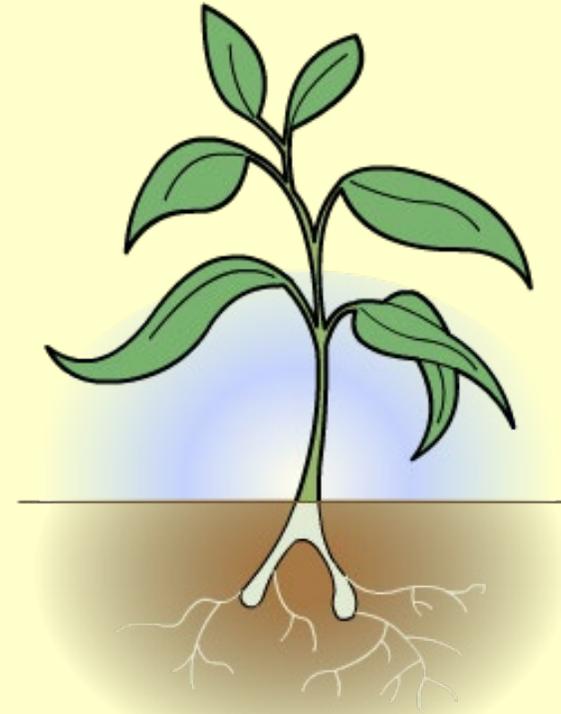
Plants make their own food in their leaves. They do not get food from the soil or from water. The leaves can make food for the plant because they are green. The green chemical in a leaf is called CHLOROPHYLL. Plants make food in a process called PHOTOSYNTHESIS. Photosynthesis can take place slowly or quickly. It depends on the temperature of the air. Photosynthesis takes place more quickly when it is warm.

Here are the 4 things needed for photosynthesis to take place:

| | | | |
|---|--|--|--|
|  sunlight |  water |  carbon dioxide |  chlorophyll |
|---|--|--|--|

Now see if you can answer these questions with TRUE or FALSE.

1. Plants get food from the soil. _____
2. Plants make food in their green leaves. _____
3. Water gives the plant the food it needs. _____
4. It is the green chemical in leaves that helps make the food. _____
5. To make food a plant needs oxygen. _____
6. Chlorophyll is green. _____
7. Photosynthesis makes chlorophyll. _____
8. Photosynthesis is when the plants makes food in its leaves. _____
9. A plant needs water to make food. _____
- 10 The plant gets food from the sun. _____
- 11 Sunlight is needed for photosynthesis. _____
- 12 The speed of photosynthesis is always the same in a leaf. _____
- 13 The speed of photosynthesis depends on the temperature. _____
- 14 It needs to be warm for photosynthesis to take place quickly. _____

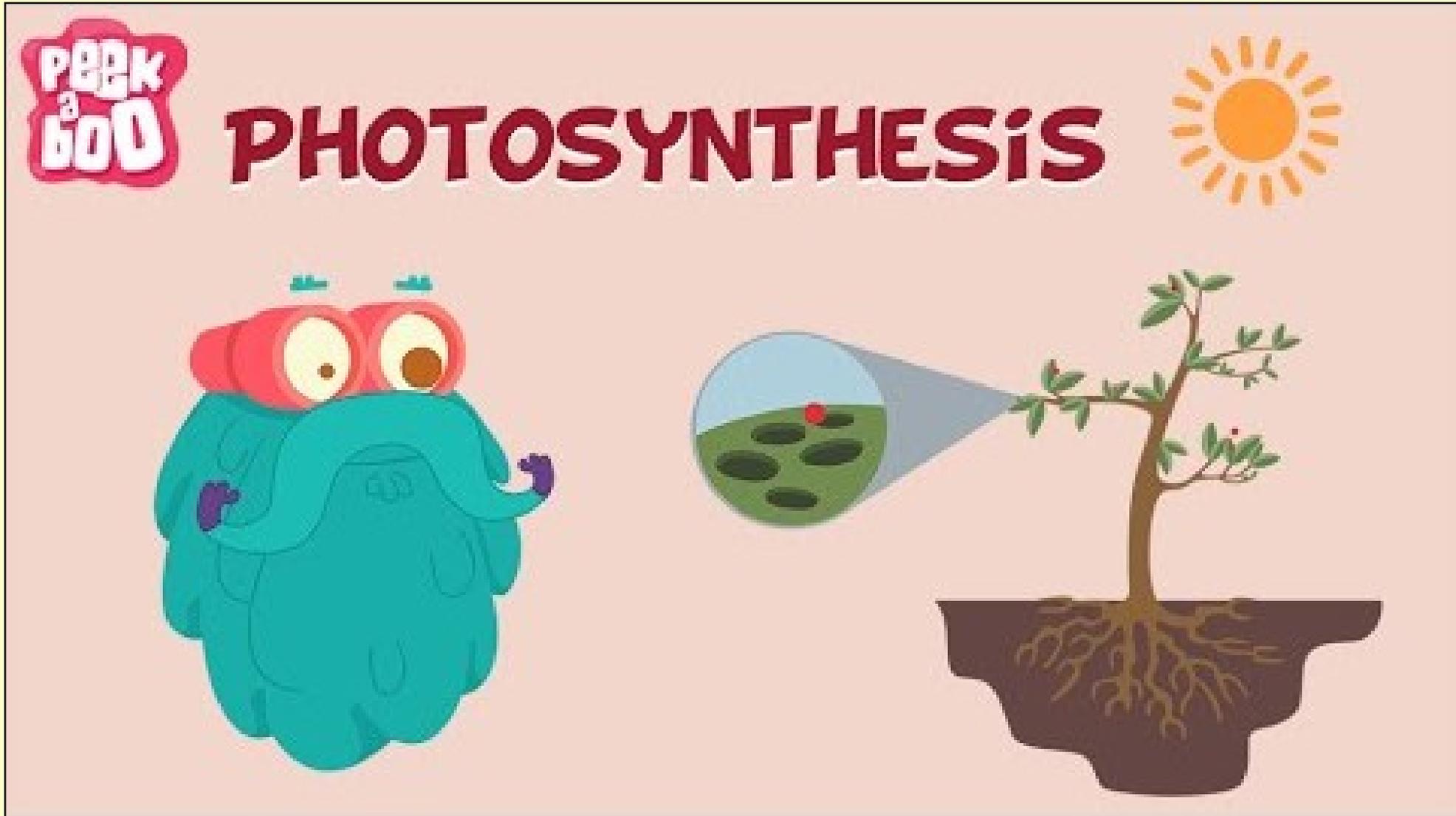


Review

Now see if you can answer these questions with TRUE or FALSE.

1. Plants get food from the soil. F
2. Plants make food in their green leaves. T
3. Water gives the plant the food it needs. F T
4. It is the green chemical in leaves that helps make the food. T
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- 14 It needs to be warm for photosynthesis to take place quickly. T

Watch the video!



With the person next to you think about how you could experiment to see how light affects rate of photosynthesis.

Think about...



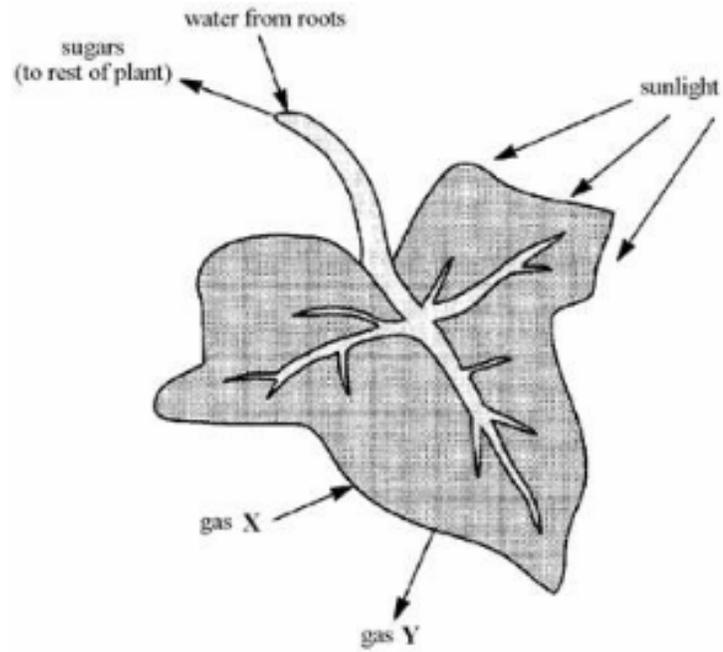
What you'll measure (Dependent)

What you'll change (independent)

Equipment to use



The diagram shows a plant leaf during photosynthesis.



(a) Name:

(i) gas X; _____

(ii) gas Y. _____

(2)

(b) Why is sunlight necessary for photosynthesis?

(1)

(Total 3 marks)

- 
- (a) (i) carbon dioxide / CO_2 (reject CO)
(ii) oxygen / O_2 / O (reject water vapour)
for 1 mark each

2

- (b) (provides) energy
for 1 mark

1

[3]