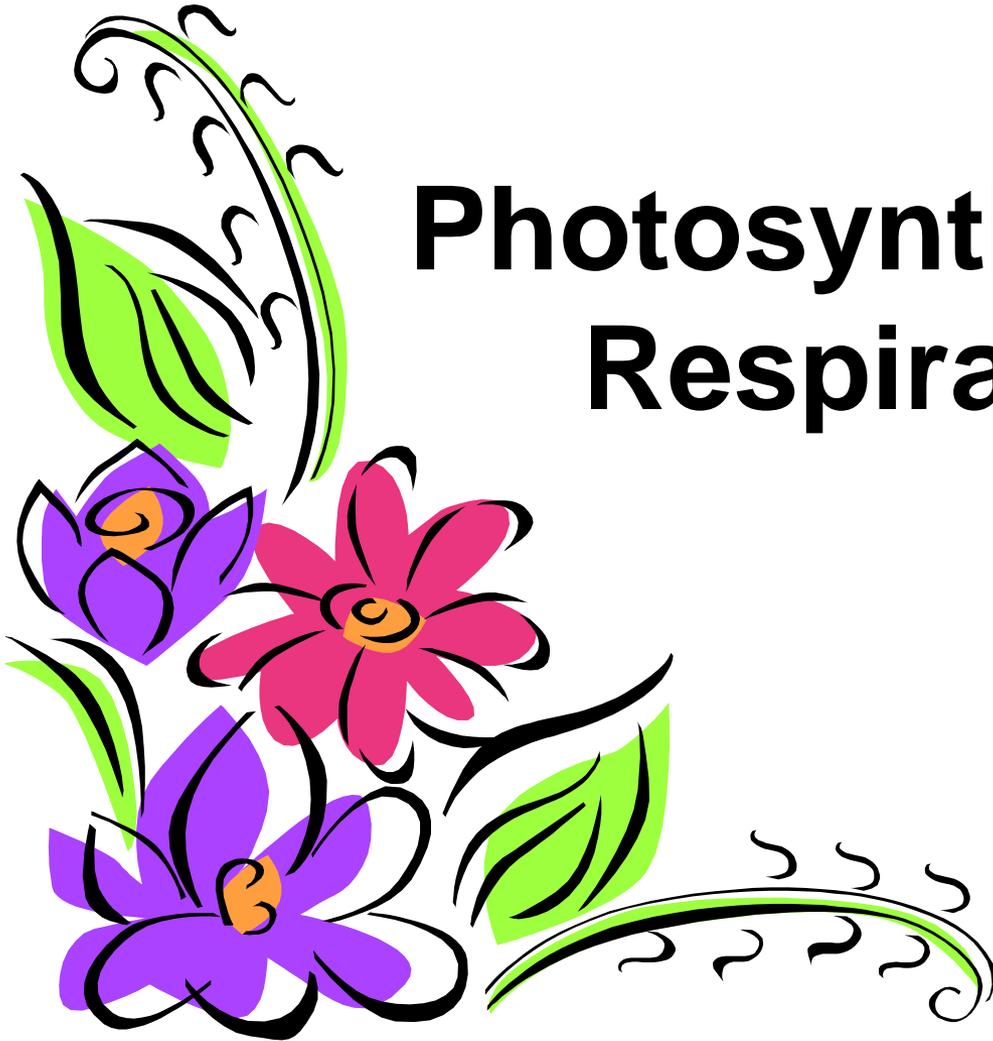


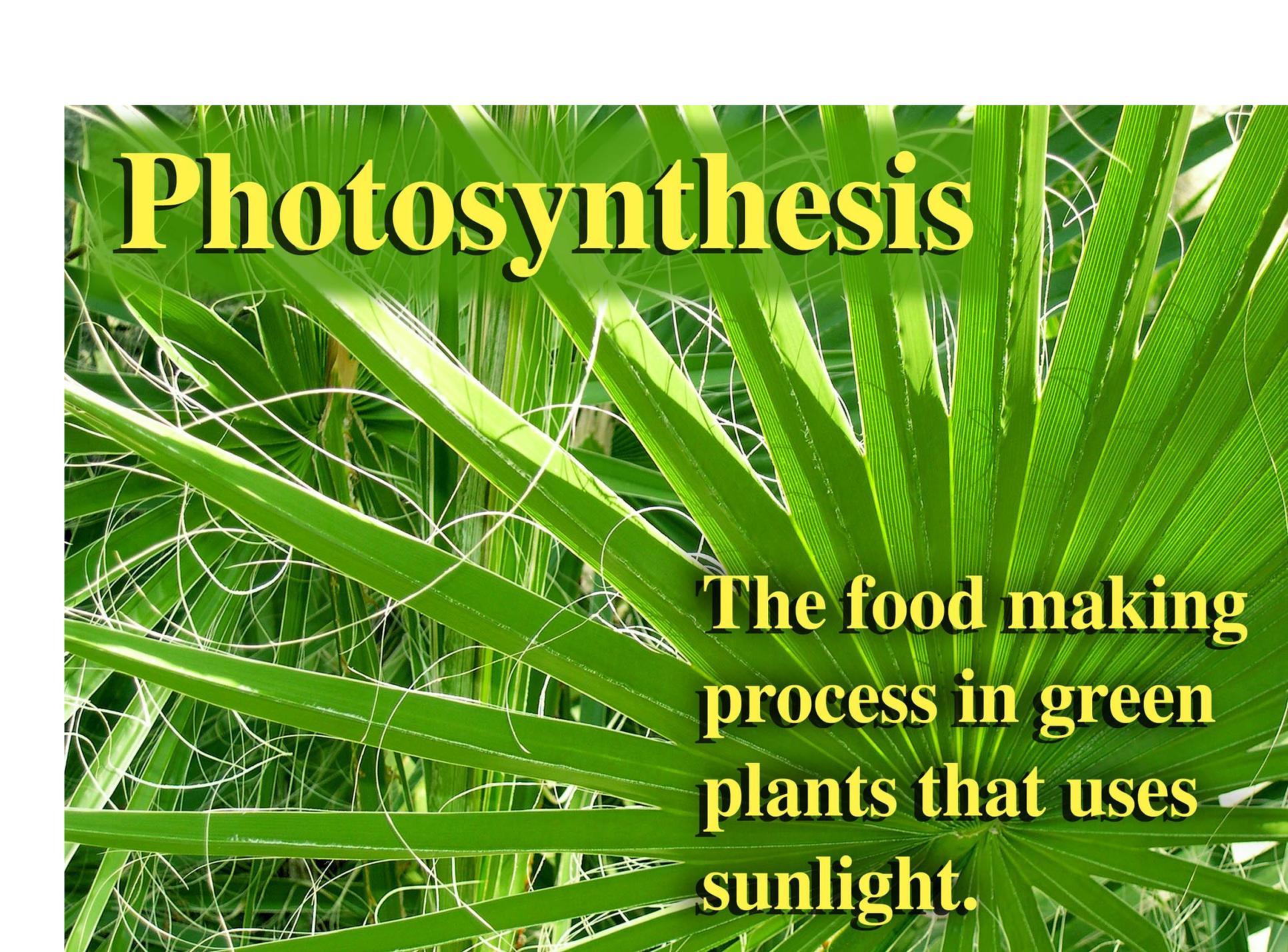
Photosynthesis & Respiration



WHAT IS PHOTOSYNTHESIS?

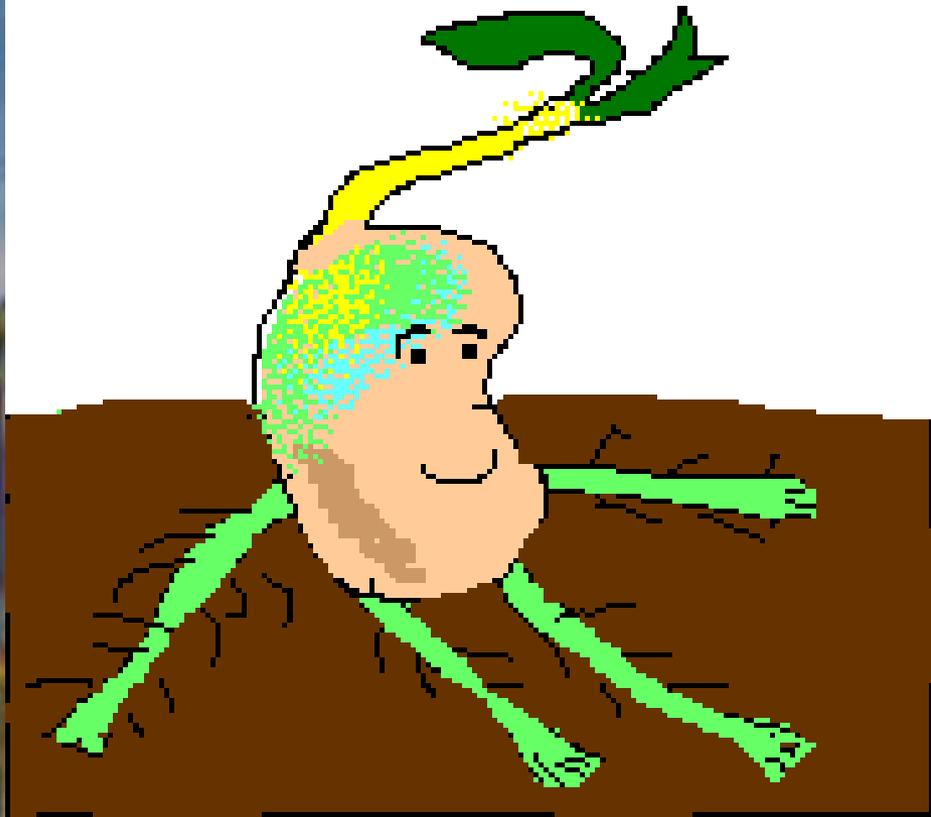


Photosynthesis

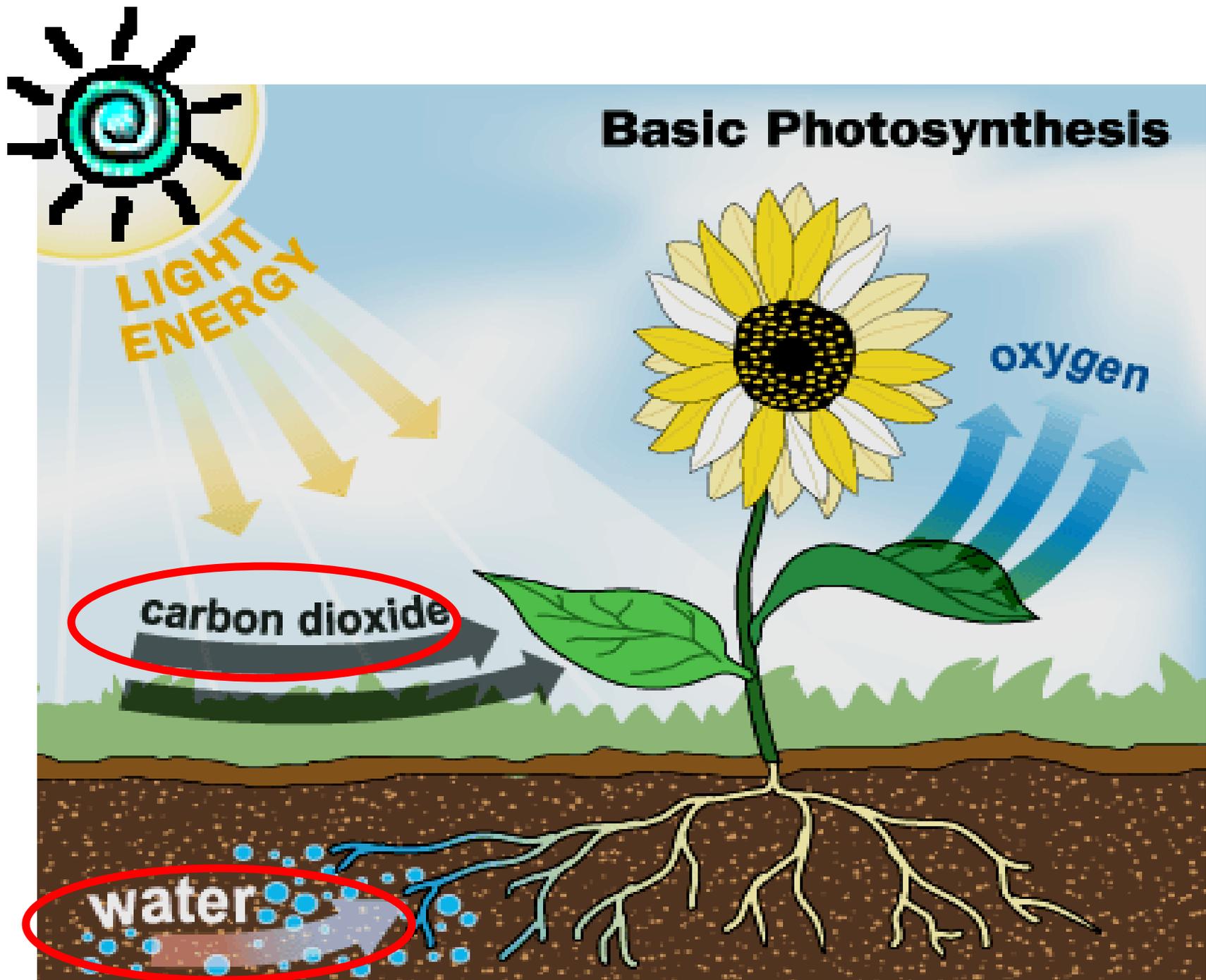
A close-up photograph of green palm fronds, showing the intricate vein structure of the leaves. The fronds are layered and create a dense, textured background. The word 'Photosynthesis' is written in a large, bold, yellow serif font across the upper portion of the image.

The food making process in green plants that uses sunlight.

WHAT DO PLANTS NEED FOR PHOTOSYNTHESIS?



Basic Photosynthesis



PHOTOSYTHENSIS

$$\text{WATER} + \text{LIGHT} = \text{CHEMICAL ENERGY}$$

Photosynthesis

1. Chloroplasts trap light energy.

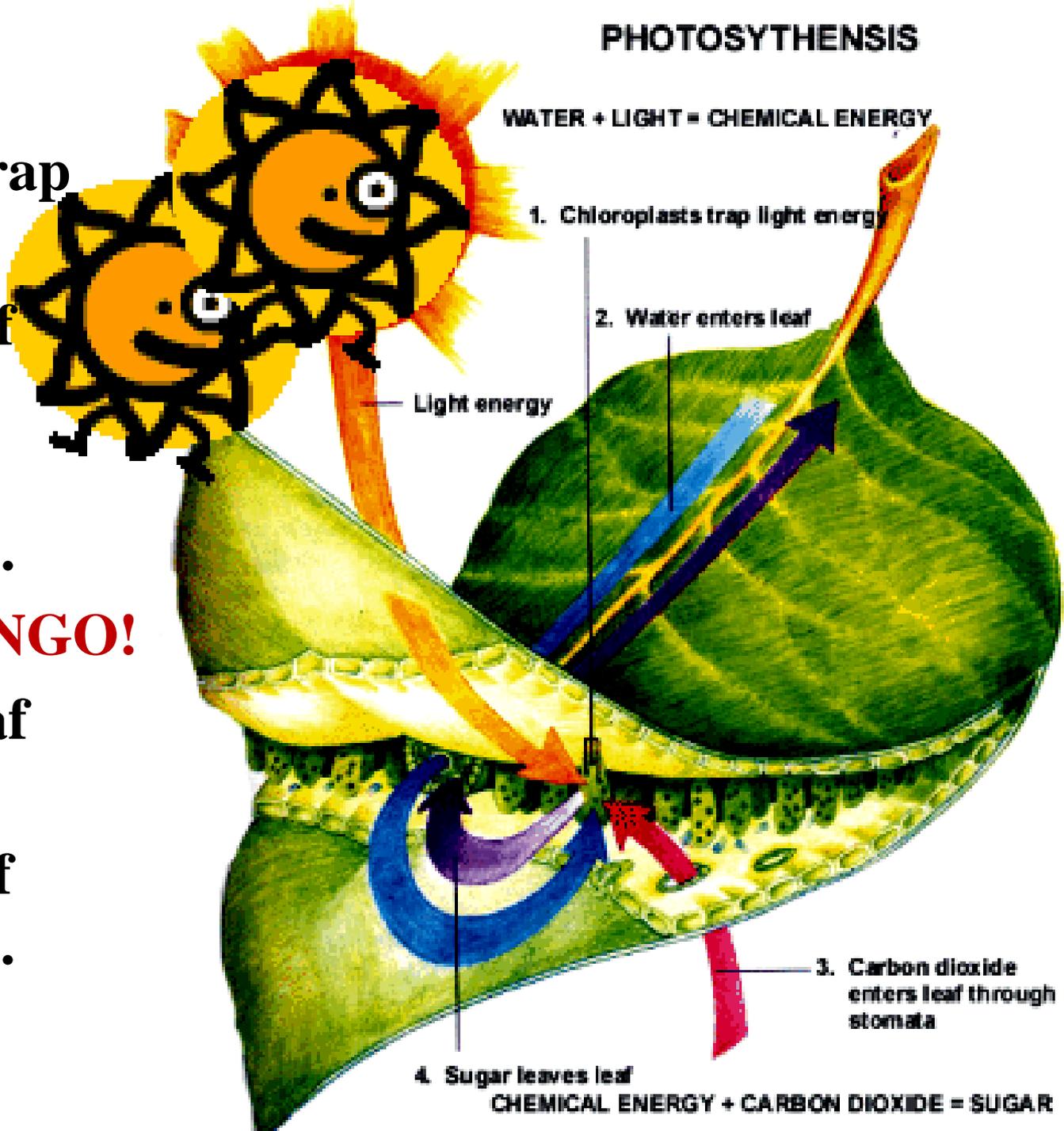
Water enters leaf through xylem.

CO₂ enters leaf through stomata.

-PRESTO CHANGO!

2. Sugar exits leaf through phloem.

Oxygen exits leaf through stomata.



PHOTOSYTHENSIS

WATER + LIGHT = CHEMICAL ENERGY

Photosynthesis

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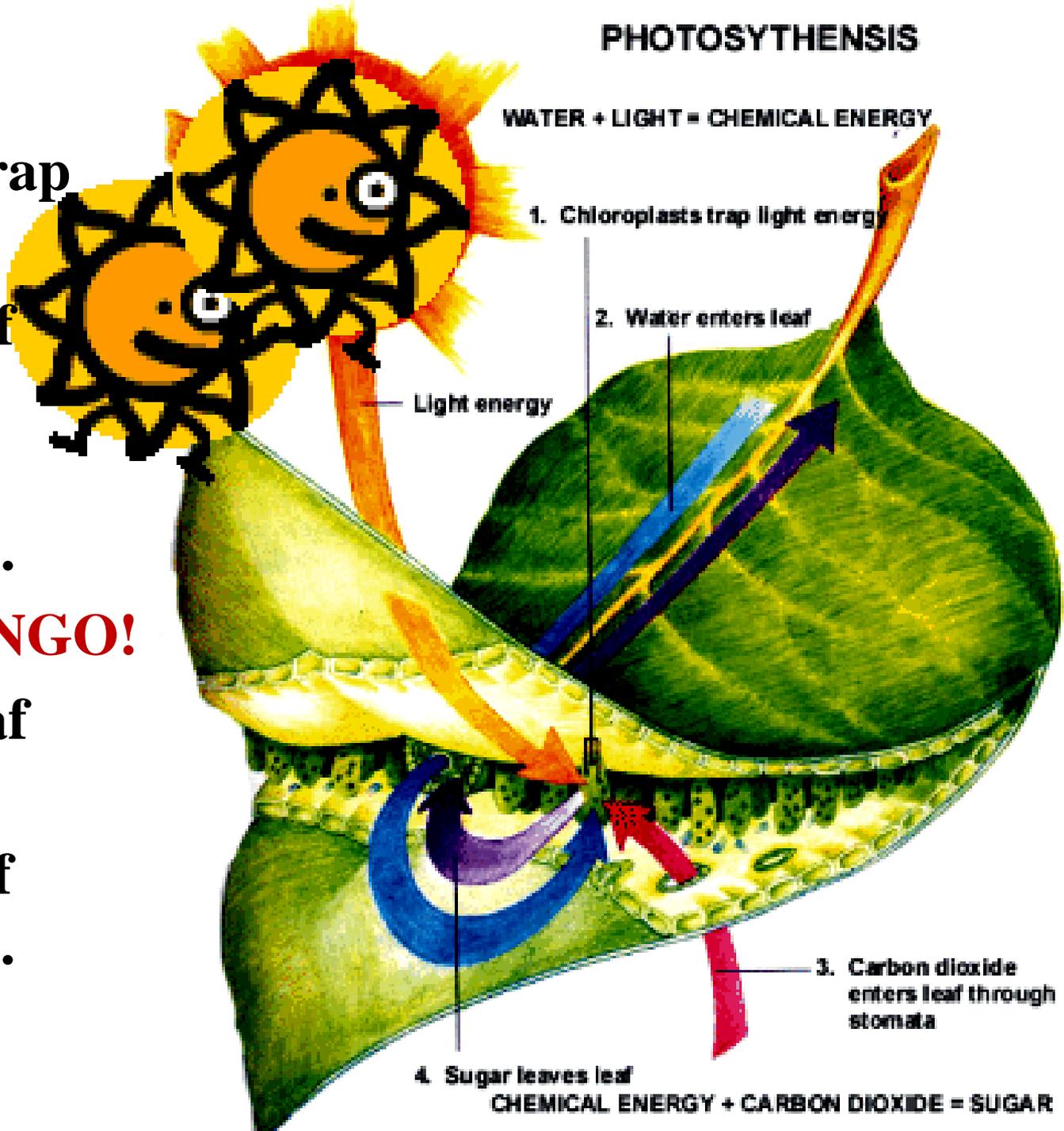
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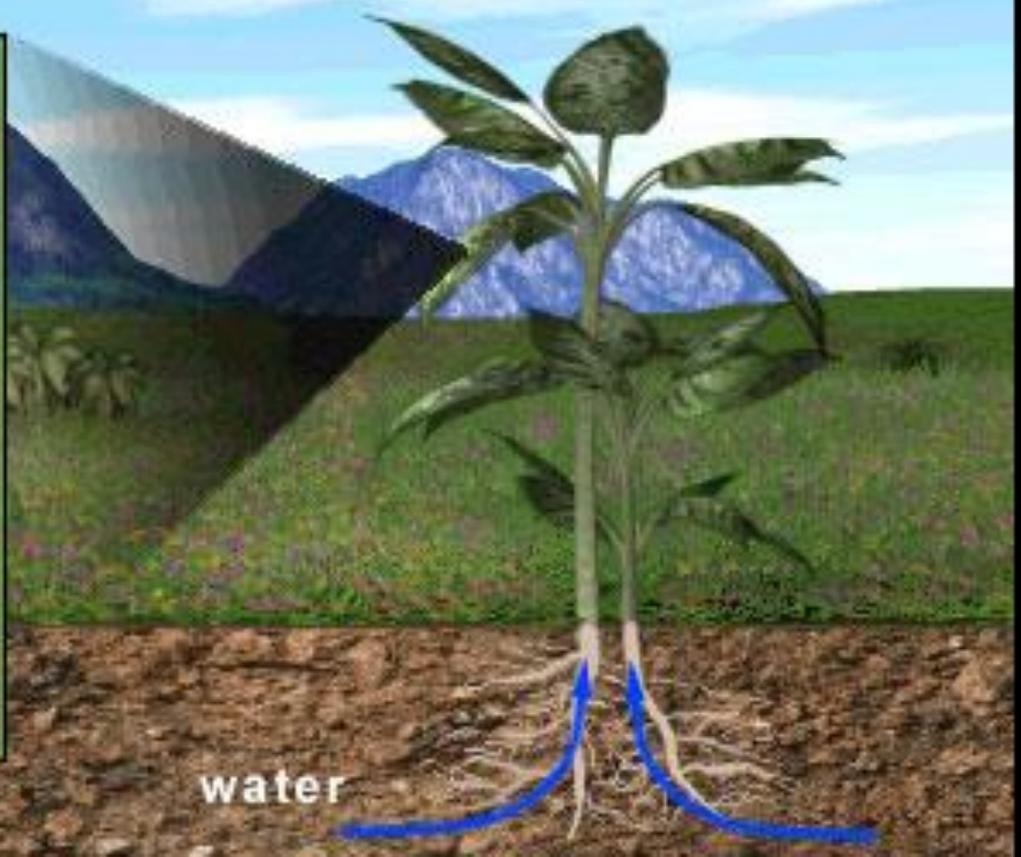
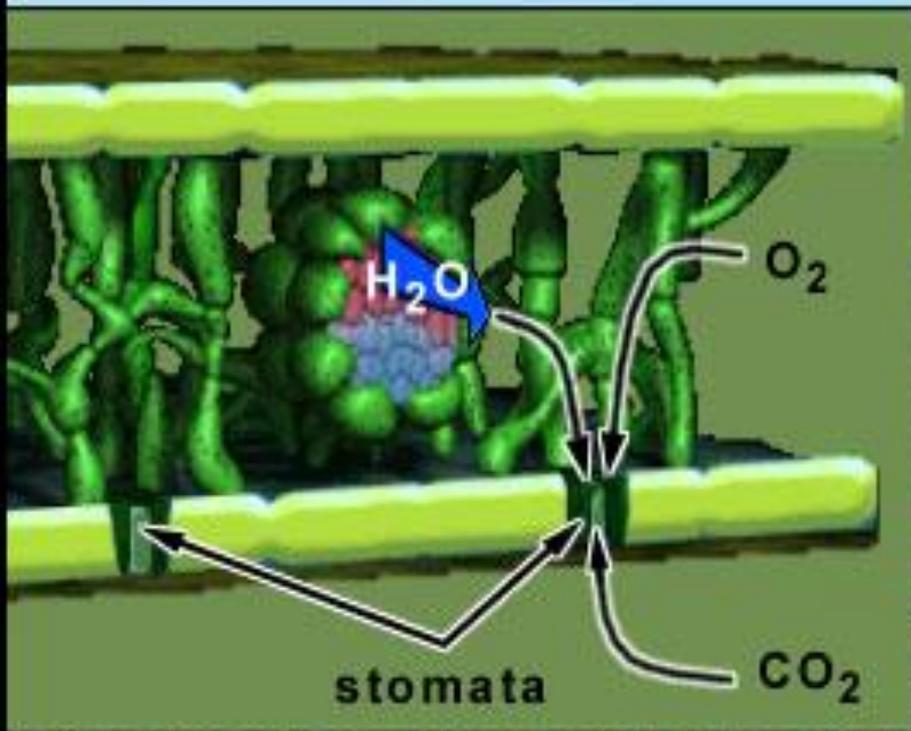
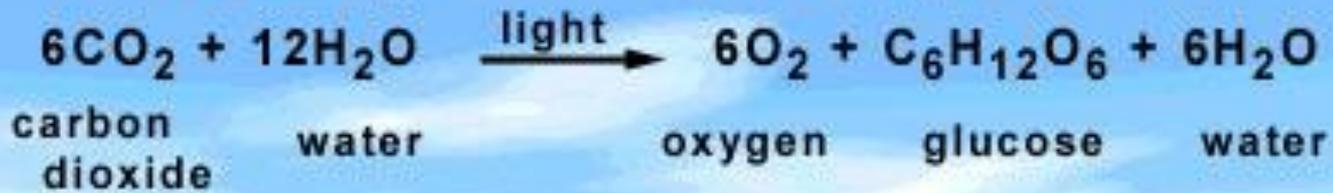


What was that chemical reaction?

- Water, carbon dioxide
- → Presto-Chango →
- Sugar, oxygen



Photosynthesis Equation

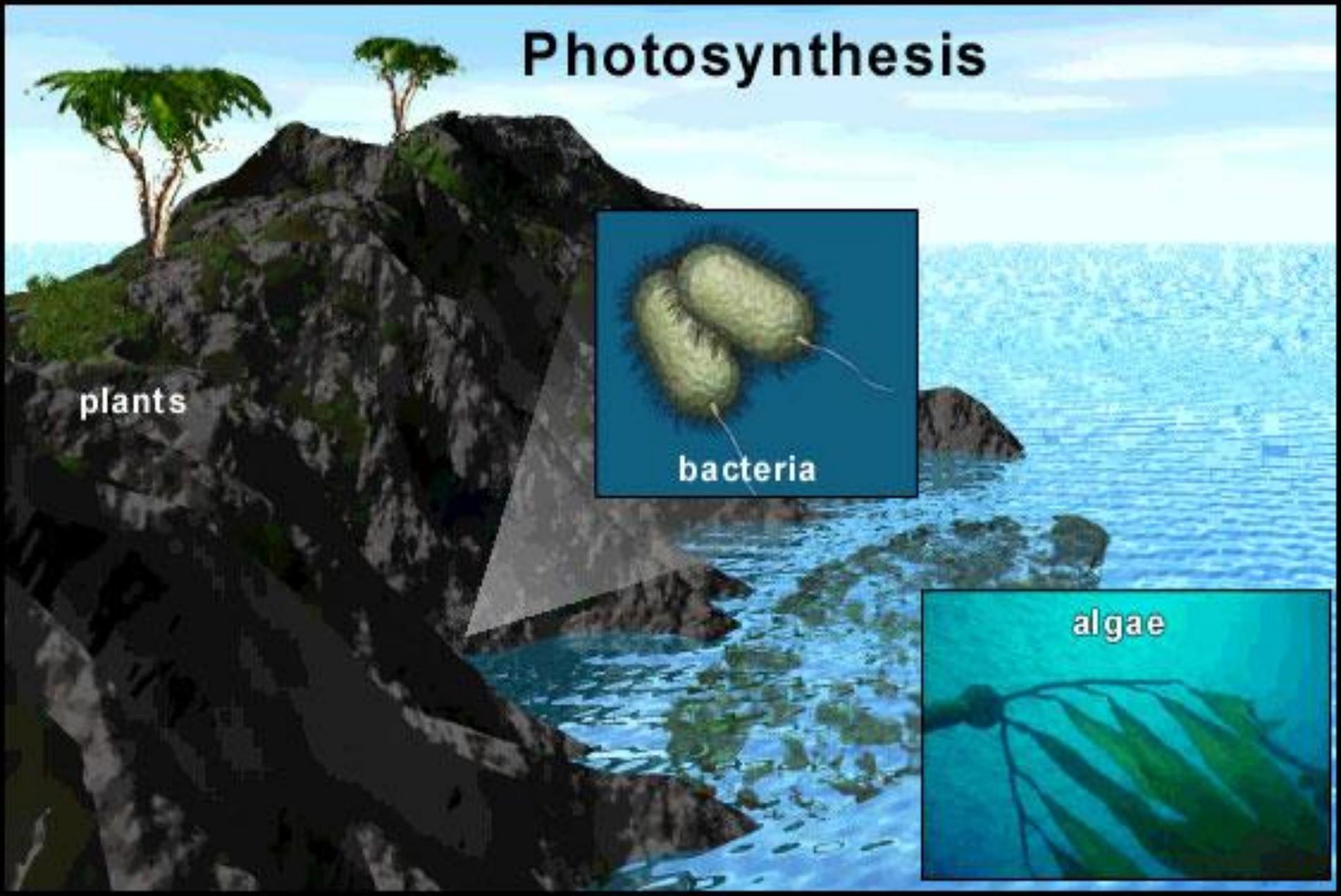


Photosynthesis

plants

bacteria

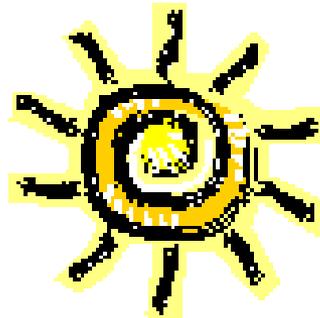
algae



Note Set #1

- 1 What do plants need for photosynthesis?
- 2 What do plants make?
- 3 What traveled through stomata?
- 4 What traveled through vascular tissues?
- 5 What traveled through space?
- 6 What organisms photosynthesize?

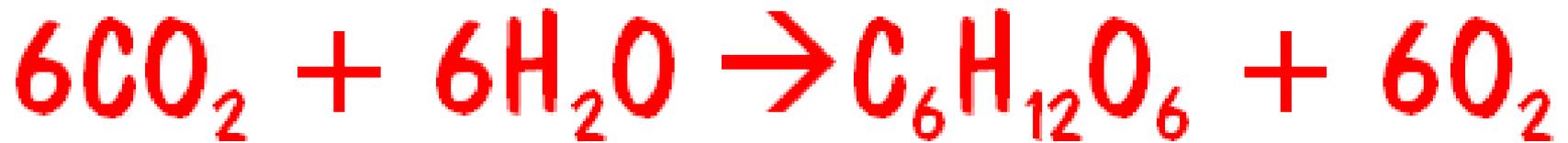
What is the equation for the chemical reaction of photosynthesis?



Light Energy



What is the equation for the chemical reaction of photosynthesis?



Six molecules of carbon dioxide react with six molecules of water to form 1 molecule of glucose and six molecules of oxygen.

Photosynthesis

- The process of changing light energy into chemical energy
- Energy is stored as sugar
- Occurs in plants, algae, some protists, and some bacteria
- Takes place in the chloroplasts of cells, using chlorophyll, the green pigment in plants
- .

What happens during photosynthesis?

- Chlorophyll of plants captures light energy and use that energy to change molecules of carbon dioxide and water into glucose and oxygen

What happens during photosynthesis?

- Carbon dioxide enters the leaf through holes called stomata . Oxygen goes out the same holes.
- CO₂ combines with water through a chemical reaction to make glucose (a sugar) and oxygen (a waste product)
- The sugar is moved through tubes (phloem) in the leaf to the roots, stems and fruits of the plants
- Some of the sugar is used right away by the plant for energy; some is stored as starch; and some is built into plant tissue
- ∴

Note Set #2

7. What is the equation for the chemical reaction of photosynthesis?
8. Photosynthesis--The process of changing _____ into _____ energy
9. Energy is stored as _____
10. Occurs in plants, algae, some protists, and _____ bacteria
11. Takes place in the _____ of cells, using _____, the green pigment in plants
12. What happens during photosynthesis? _____ of plants captures light energy and use that energy to change molecules of _____ and _____ into _____ and _____
13. Carbon dioxide _____ the leaf through holes called stomata . Oxygen _____ the same holes.
14. _____ combines with _____ through a chemical reaction to make _____ (a sugar) and _____ (a waste product)
15. The sugar is moved through tubes (_____) in the leaf to the _____, stems and _____ of the plants
16. Some of the _____ is used right away by the plant for energy; some is stored as _____; and some is built into _____

Why is this important to us?

- Plants are producers, the first step in the food chain.
- We cannot make our own food; we must get our food from plants.

Why is this important to us?

- The oxygen released during photosynthesis is necessary for almost all living things.
- Oxygen enters the human through holes called mouth and nose. Carbon dioxide goes out the same holes.

This can happen because...

- Carbon dioxide enters the leaf through holes called stomata . Oxygen goes out the same holes.

More about stomata—Transpiration

- Unfortunately for most plants, water vapor escapes from leaves through the stomata. This is called **transpiration**.
- **Guard cells** surround the stomata and close them at times to prevent too much water loss.

**So photosynthesis is
required for respiration, and
vice versa.**

Learn more about photosynthesis at:

<http://www.ftexploring.com/me/photosyn1.html>

Note Set #3

17. Why is this important to us? Plants are _____, the first step in the food chain.
18. We cannot make our own food; we must get our food from _____.
19. The oxygen released during photosynthesis is necessary for _____
_____.
20. Oxygen _____ the human through holes called _____ and _____. Carbon dioxide _____ the same holes.
21. This can happen because...Carbon dioxide _____ the leaf through holes called stomata . Oxygen _____ the same holes.
22. So _____ is required for _____, and vice versa.

Learn more about photosynthesis at:

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What is Cellular Respiration?

The release of chemical energy for use by cells.

What is Cellular Respiration?

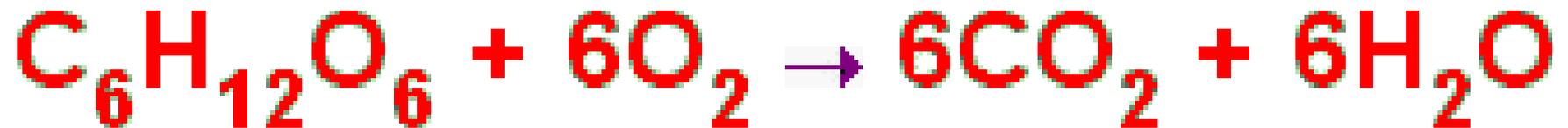
- Once the energy that was in sunlight is changed into chemical energy (glucose) by photosynthesis, an organism has to transform the chemical energy into a form that can be used by the organism.
- This process is cellular respiration.
- We need respiration because we can't use sunlight to move our cells and bodies.
- .

Cellular Respiration

- The breakdown of glucose molecules to release energy
- Takes place in all organisms (though some organisms don't use oxygen. You will study those in high school biology.)
- Respiration, like photosynthesis, is a step-by-step process.
- .

What is the chemical equation for cellular respiration?

The chemical equation for respiration is:



Glucose + Oxygen \rightarrow Carbon Dioxide + Water

Note Set #4

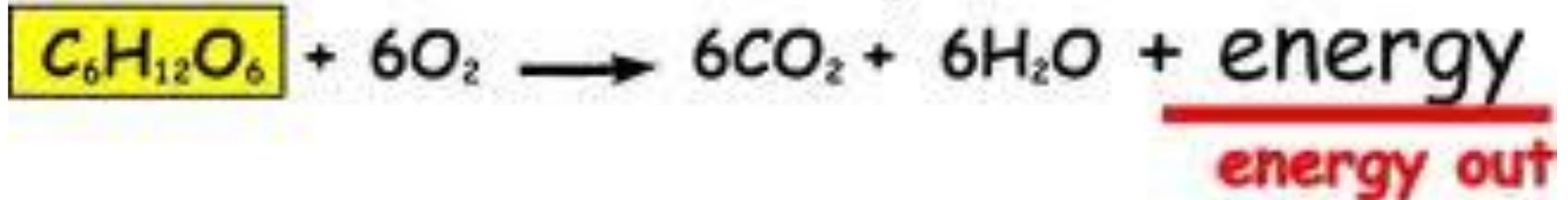
24. What is Cellular Respiration? The release of _____ for use by _____.
25. What is Cellular Respiration? Once the energy that was in sunlight is changed into chemical energy (_____) by _____, an organism has to transform the chemical energy into _____ that can be used by the organism.
26. This process is _____.
27. We need respiration because we can't use sunlight to move our cells and bodies.
28. Cellular Respiration: The _____ of glucose molecules to _____ energy
29. Cellular respiration takes place in _____ organisms (though some organisms don't use oxygen. You will study those in high school biology.)
30. Respiration, like _____, is a step-by-step process.
31. What is the chemical equation for cellular respiration? (Use words or chemical symbols.)

How do the chemical reactions of photosynthesis and respiration complement each other?

photosynthesis

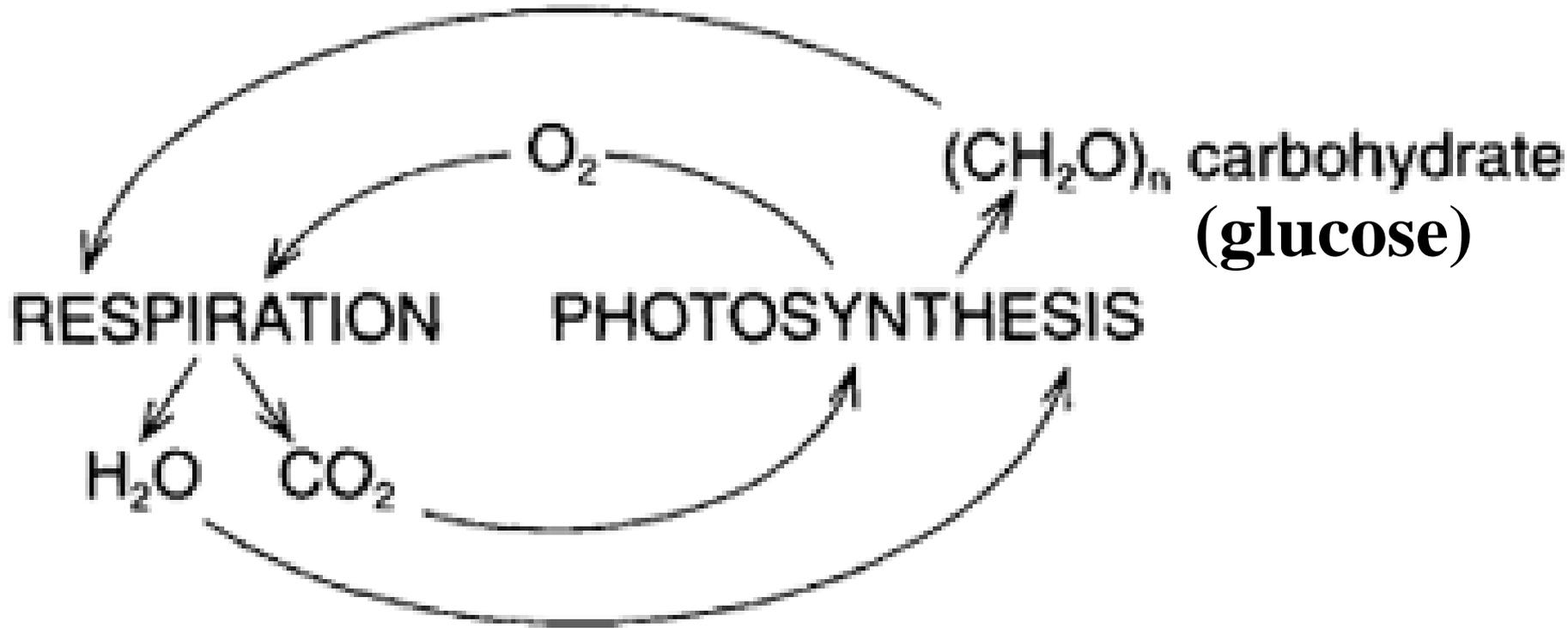


aerobic respiration



- The products of one process are the reactants of the other.

How do the chemical reactions of photosynthesis and respiration complement each other?



- The products of one process are the reactants of the other.
- Do you see the reversal?

Note Set #5 –Review

32. How do the chemical reactions of photosynthesis and respiration complement each other?
33. The _____ of one process are the _____ of the other.
34. Do you see the reversal?
35. What related questions do you still have?