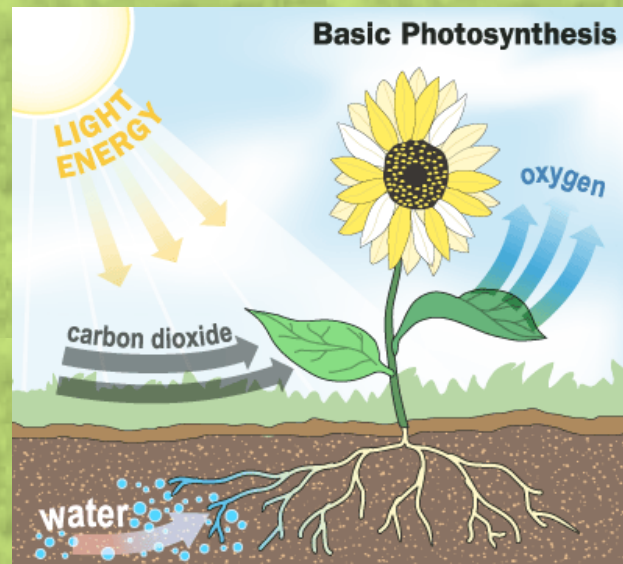


PHOTOSYNTHESIS AND CELL RESPIRATION

[HTTP://WWW.YOUTUBE.COM/WATCH?V=PFSTY-XYLZC](http://www.youtube.com/watch?v=PFSTY-XYLZC)

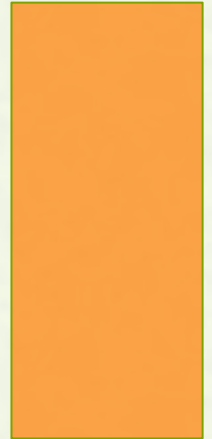


PHOTOSYNTHESIS - IS ONE OF THE MOST IMPORTANT BIOLOGICAL EVENTS THAT OCCURS ON THIS PLANET. THE ROOTS OF THE WORD ARE:

PHOTO = "LIGHT"

SYNTHESIS = "MAKING"

PHOTOSYNTHESIS



PHOTOSYNTHESIS

-Photosynthesis – is the process by which **plants** use solar energy to convert carbon dioxide (CO_2) and water (H_2O) into glucose or sugar ($\text{C}_6\text{H}_{12}\text{O}_6$) as an energy source.

Plants cannot eat, they are **producers** – which means they make their own food

-During this process, oxygen gas (O_2) is produced as a bi-product/waste

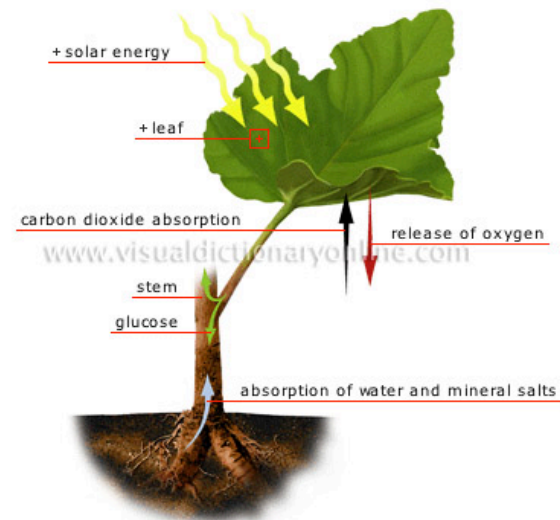
- <https://www.youtube.com/watch?v=eJQxHoqIPIM>

QUESTION 1

- **What are the two molecules plants need to start the process of photosynthesis?**

PHOTOSYNTHESIS

- Glucose ($C_6H_{12}O_6$) , a sugar is used as energy/food by plants to help them:
- 1. Grow
- 2. Reproduce
- 3. Make starches, proteins, and fats



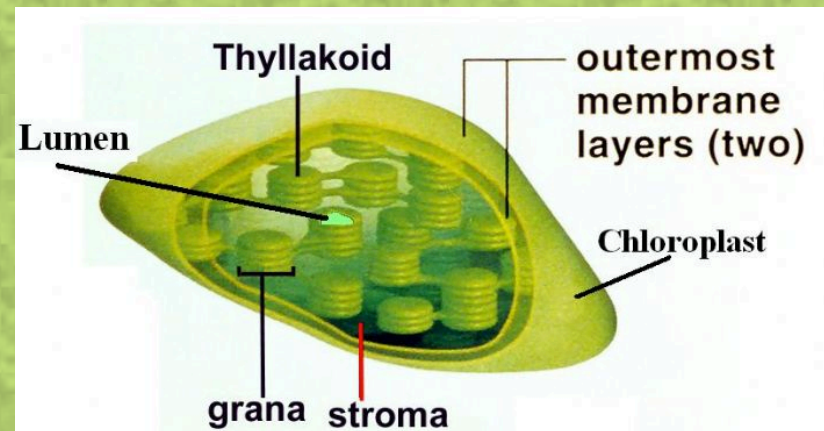
QUESTION 2

- **What are the two things that are made once photosynthesis occurs?**

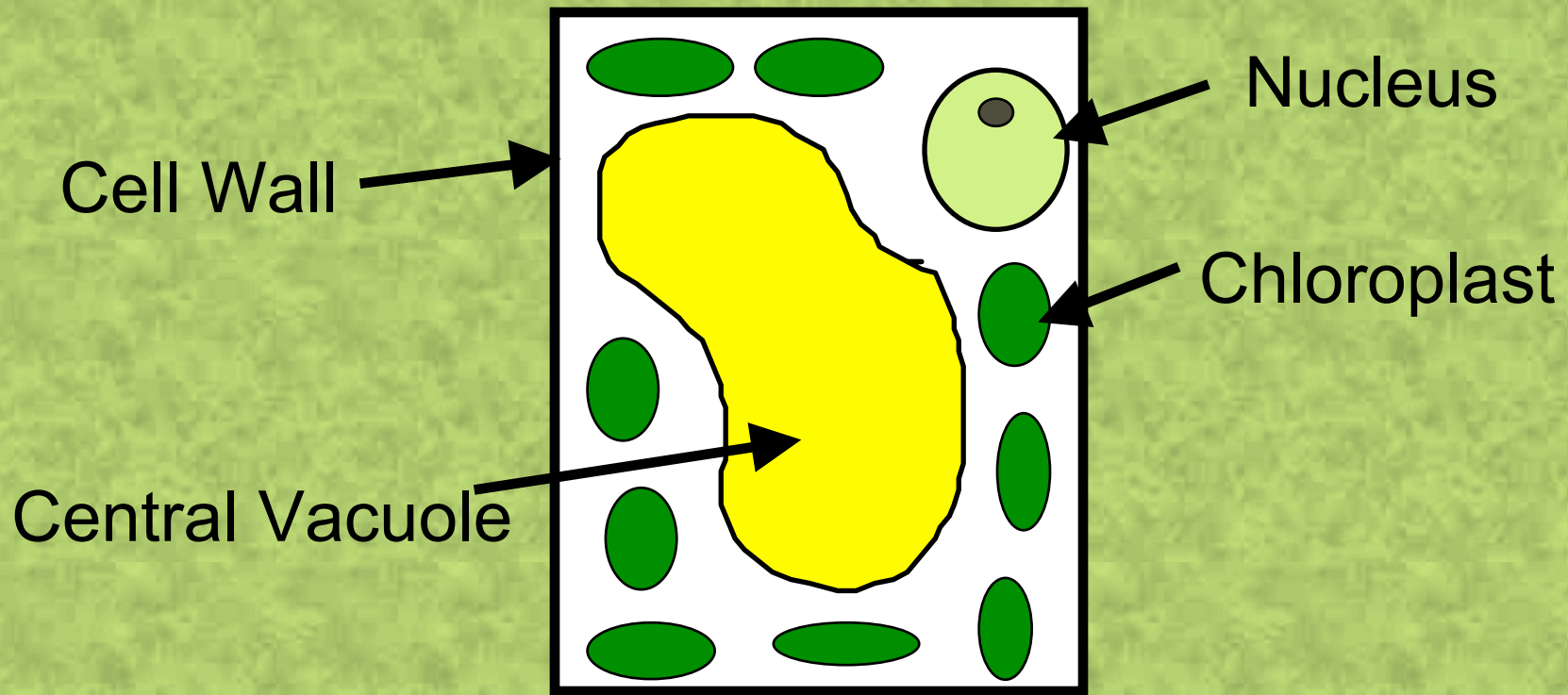


WHERE DOES PHOTOSYNTHESIS HAPPEN?

- Photosynthesis happens in the **chloroplast** of plant cells
- Chloroplasts are organelles found in all higher plant and some bacteria cells.
- Chloroplasts contain chlorophyll which is responsible for the plant's green color and the plant's ability to absorb and store energy from sunlight.



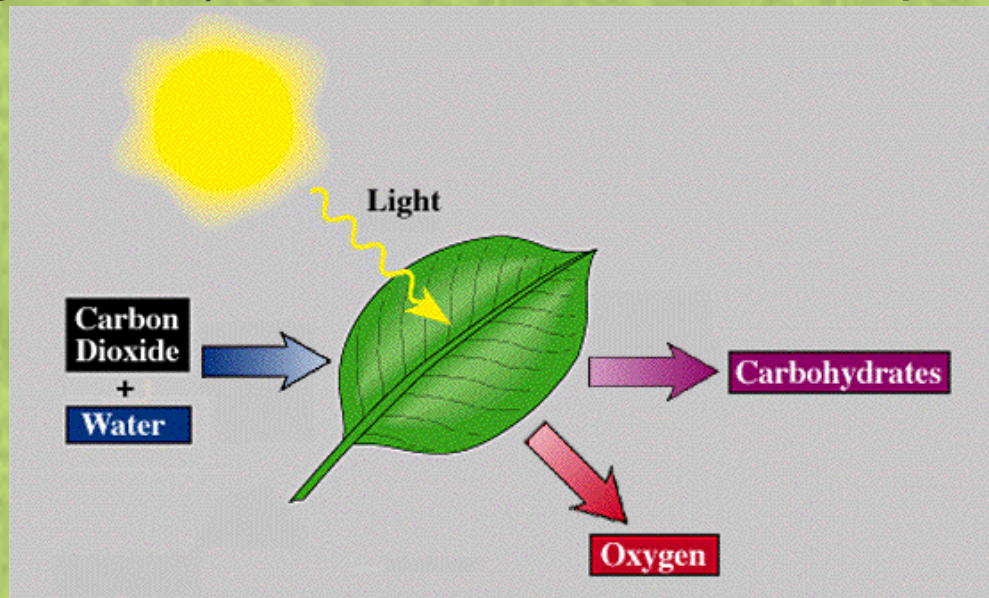
CELL OF LEAF



Photosynthesis occurs in these cells!

When does Photosynthesis happen?

- Photosynthesis can **only** happen **during the day** because it requires the sun start the process
- Sunlight energy is **transformed** into chemical energy(glucose) which is **stored** for the plant



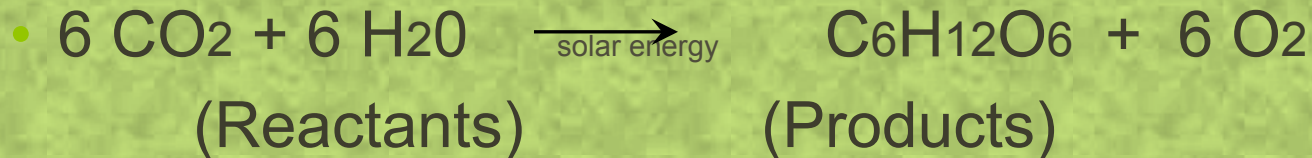
QUESTION 3

- **Where does photosynthesis happen?**



PHOTOSYNTHESIS FORMULA

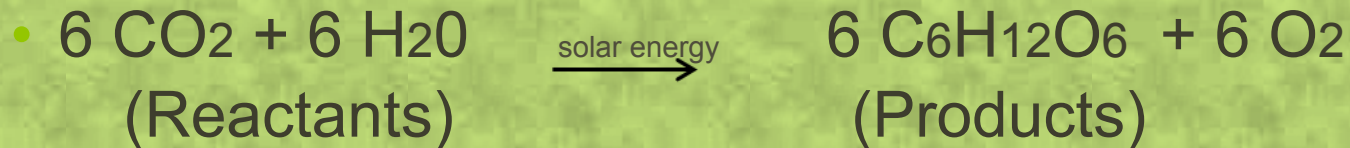
- Photosynthesis can be expressed using a simple formula:



- Reactants: the substances you start with, or the substances that react with one another
- Products: The substances you end with, or what is produced after the reaction happens

PHOTOSYNTHESIS FORMULA

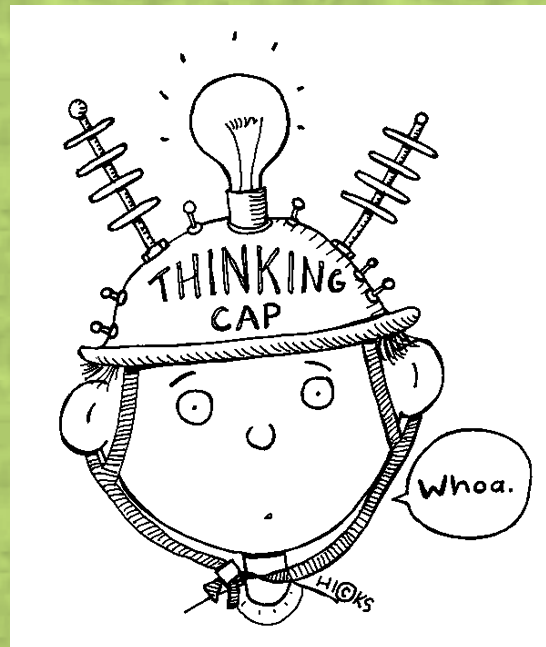
- Reactants: Carbon Dioxide and Water
 - With solar energy
- Products: Glucose and Oxygen



- **Glucose is stored in bonds that are created in the form of glucose**
- Oxygen is a bi-product, a product not used by plants that they release into the atmosphere

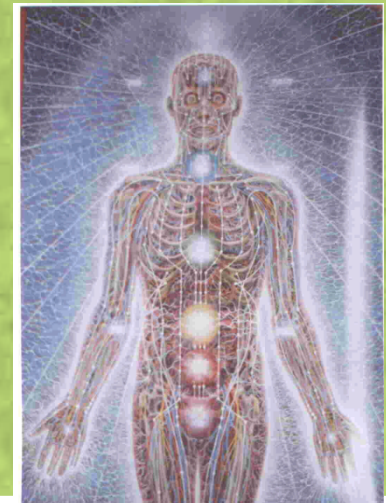
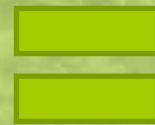
THINK AHEAD

- Why would it be important to us and animals that plants release oxygen as its bi-product ?



CELL RESPIRATION

- Cell Respiration- is the process by which **animal cells** and **plant cells** convert oxygen (O_2) and food (glucose ($C_6H_{12}O_6$)) into energy for cellular activities
- The **creation of Energy** is the main and most important product of this reaction and Carbon Dioxide (CO_2) and water (H_2O) are its bi-products



QUESTION 4

- **What is the main purpose of cell respiration?**



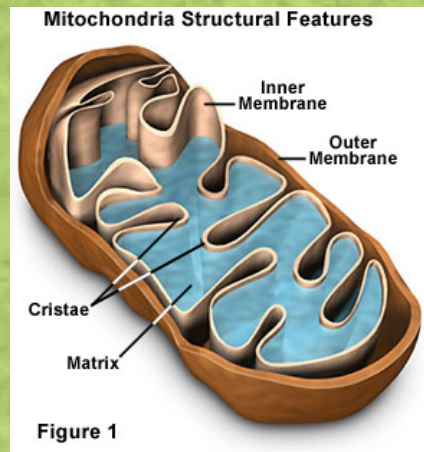
2 Types of Cellular Respiration

- Aerobic – occurs when there is oxygen (very efficient)
 - -animals/plants that live in an oxygen rich environment use this most of the time
 - - however if there is not enough oxygen entering the lungs the body can switch over to anaerobic (like at the peak of exercising!)
- Anaerobic – occurs when there is a lack of oxygen
 - - animals/plants that live in environments oxygen evolved to use this type of
 - respiration



WHERE DOES CELL RESPIRATION HAPPEN?

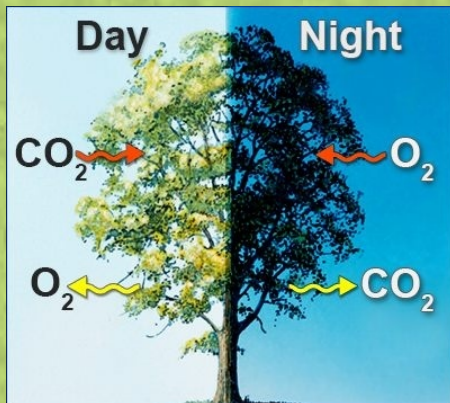
- **Cell respiration happens in the mitochondria** (powerhouse) of animal, plant, and bacterial cells.
- Plants need both chloroplasts and mitochondria to make useable energy for their cells: Chloroplasts to convert sunlight to glucose and mitochondria changes glucose into chemical energy the plant cells can use



When does cellular respiration happen?

- **Cellular Respiration happens all the time!** Both night and day plants and animals do cellular respiration
- Cellular respiration occurs at a faster rate during the day for most plants and animals because they are more active during the day

Except nocturnal organisms!





QUESTION 6

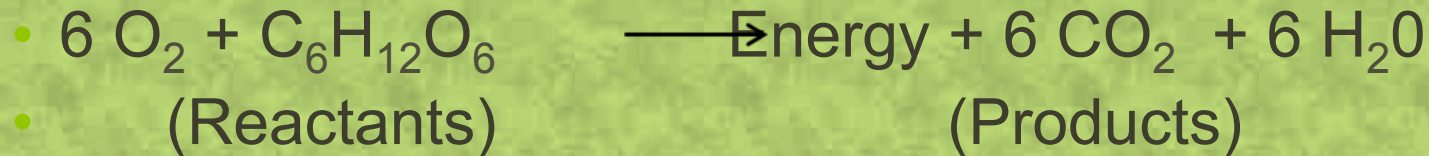
- **Where does cellular respiration happen?**



CELLULAR RESPIRATION FORMULA

- Cell Respiration can be expressed in a simple formula:
- $6 \text{ O}_2 + \text{C}_6\text{H}_{12}\text{O}_6 \longrightarrow \text{ATP}(\text{Energy}) + 6 \text{ CO}_2 + 6 \text{ H}_2\text{O}$
 - (Reactants) (Products)
- Reactants: Oxygen (O_2) and Glucose(from food you eat) ($\text{C}_6\text{H}_{12}\text{O}_6$)
- Products: Energy(ATP), Carbon Dioxide (CO_2 ,) and Water (H_2O)

CELLULAR RESPIRATION FORMULA



- **Energy** is the most important Product of cell respiration
- Energy can be in the form of heat, light, ATP, etc
- Energy is made by **breaking the bonds** in glucose
- Carbon Dioxide and water are bi-products that are release into the atmosphere: animals by exhaling, plants by transpiration (loosing water through the leaves)

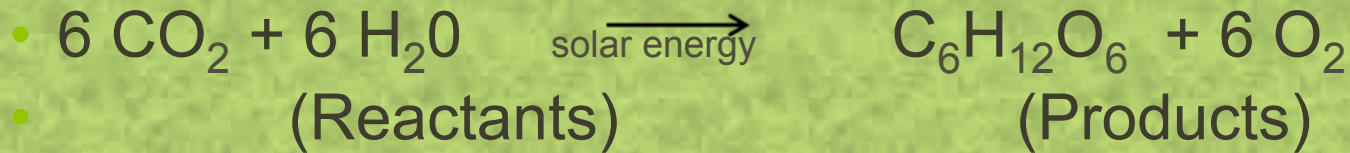
QUESTION 7

- What is the most important product of cell respiration?

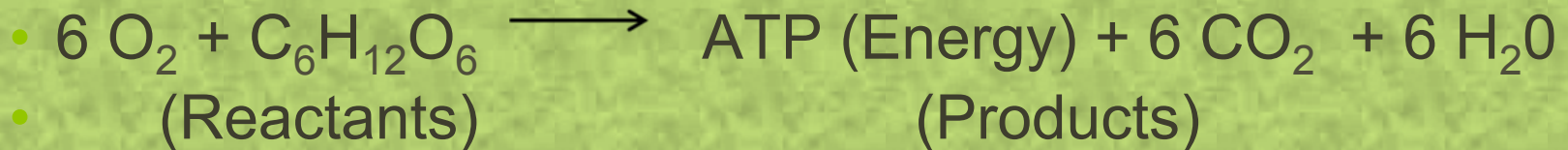


NOTICE!!!!

- Photosynthesis



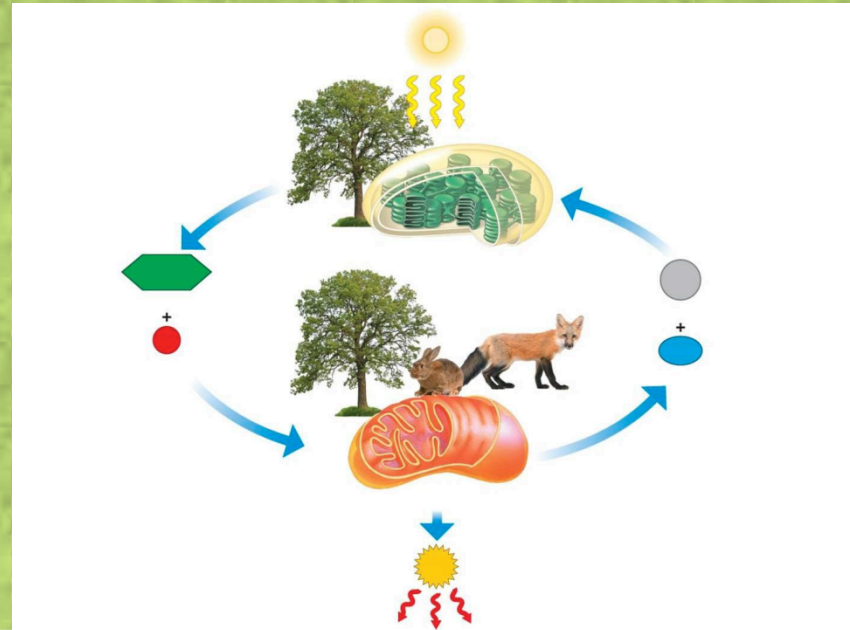
- Cell respiration



- What do you notice about the two formulas??
- -- They're opposite of one another

IN CONCLUSION

- Photosynthesis and Cellular Respiration occur in a cycle.
- Plants release oxygen into the atmosphere that animals need to make energy.
- Animals release carbon dioxide into the atmosphere that plants need to make energy



IT'S A CYCLE!!!

