ملخص وشرح الدرس الأول Cellular and Photosynthesis المتقدم المسار الخلوي والتنفس الضوئي البناء Respiration

تاريخ إضافة الملف على موقع المناهج: 2024-09-24 14:02:11

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المزيد من الملفات بحسب الصف السادس والمادة علوم في الفصل الأول

1	ملخص وشرح الدرس الثاني and Structure Cell المتقدم المسار ووظيفتها الخلية بنية Function
2	ملخص وشرح الدرس الأول Life Exploring المسار المتقدم
3	ملخص وشرح الدرس الرابع Materials Moving نقل المواد المسار المتقدم

المزيد من الملفات بحسب الصف السادس والمادة علوم في الفصل الأول	
4	ملخص وشرح الدرس الثالث and energy Obtaining المسار النفايات وإزالة الطاقة على الحصول removing waste المتقدم
5	ملخص وشرح الدرس الثاني Support and Structure التركيب والدعم المسار المتقدم

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Matter and Energy in Ecosystems

L1: Photosynthesis and cellular respiration

Inspire Science

Organelle	Function	Plant, animal, or both?
Nucleus		
Mitochondria		
Chloroplasts		
Cell Wall		
Cell Membrane		

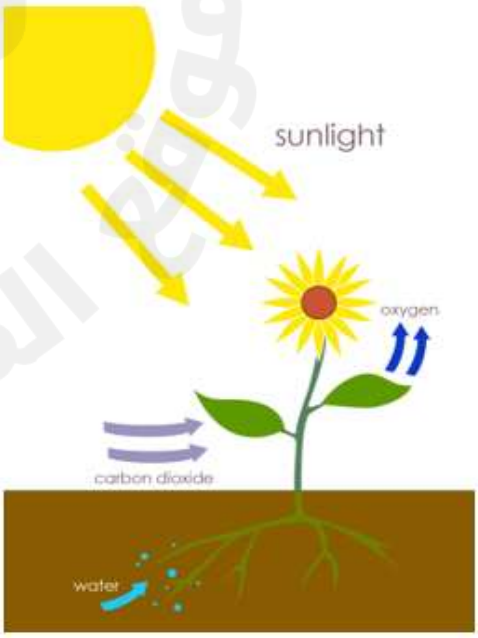
Why do plants needs sunlight ?!

Plants needs to eat , but they can not make eat food lie the human . So they make there own food .

leaves are the major food producing organ in the plant.

Leaves gets the energy for making the food from the sunlight

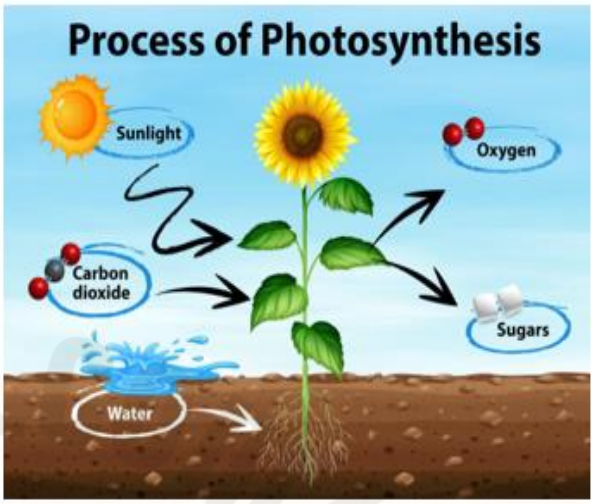
That's why you can notice in some plants the leaves are turned towards the sun light



Photosynthesis

Leaves are the sites of photosynthesis in plants.

Plants and some unicellular organisms such as algae , phytoplankton (العوالق النباتية) and other microorganisms obtain energy from the sunlight through a process we call it PHOTOSYNTHESIS .



It is a series of chemical reactions that convert LIGHT ENERGY , WATER , AND CARBON DIOXIDE into the glucose (sugar in the plant) . And give off the oxygen .

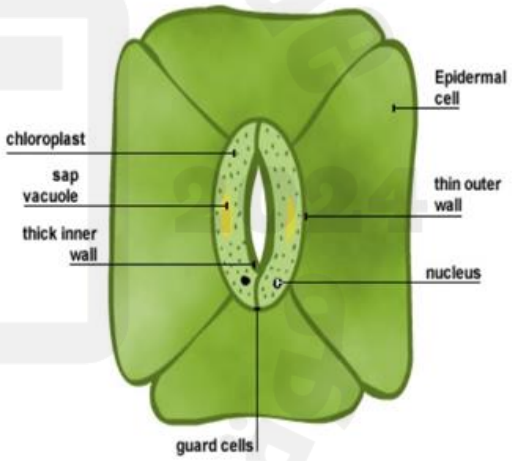
The glucose can be used immediately or stored for growth or late use

Leaves contain many types of cells

1) EPIDERMAL : it is the cell that makes the top and the bottom layers of the leaf
2) it is flat , irregular shaped
3) On the bottom epidermal of most leaves are small openings called STOMATA

CARBON DIOXIDE , WATER VAPOR , AND OXYGEN pass through stomata

4) Epidermal cell can produce a waxy covering cell called cuticle



Most photosynthesis occurs in tow types of <u>mesophyll</u> (cells inside the leaf)

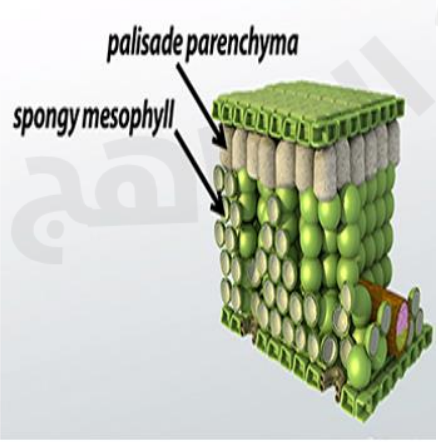
These cells contain chloroplast (the organelles where photosynthesis occurs)

Near of top surface of the leaf are palisade mesophyll cell

They are packed together

This arrangement exposed the most cells to the light

Spongy mesophyll has open spaces between them because photosynthesis needs gas and the gas enters from these spaces



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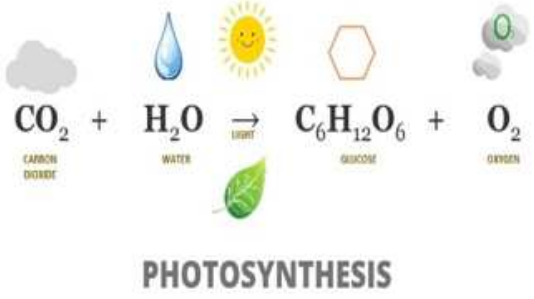
Capturing light energy

1) first step of photosynthesis ,plants capture the energy in the light , this occur in chloroplasts , which contain plant pigments

Pigments are chemicals that can absorb and reflect the light

Most plants appear green because the chlorophyl reflects green light and absorbs other colors of light

2) During photosynthesis water molecules are split apart . This release oxygen in atmosphere



Making sugar

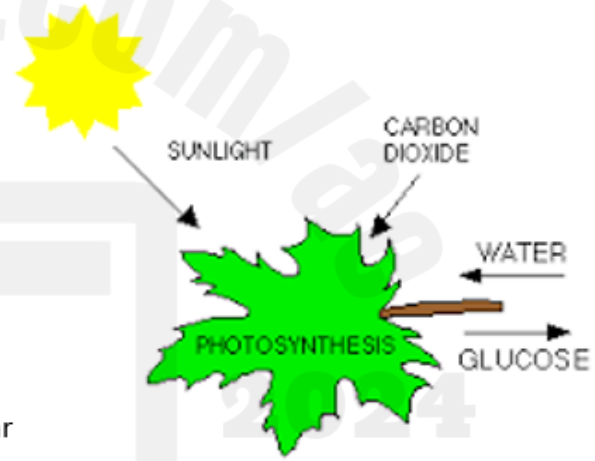
Sugar are made in the second step of photosynthesis , which can occur without light , in chloroplasts .

Carbon dioxide from the air is converted into sugars by using the energy stored and trapped by chlorophyll.

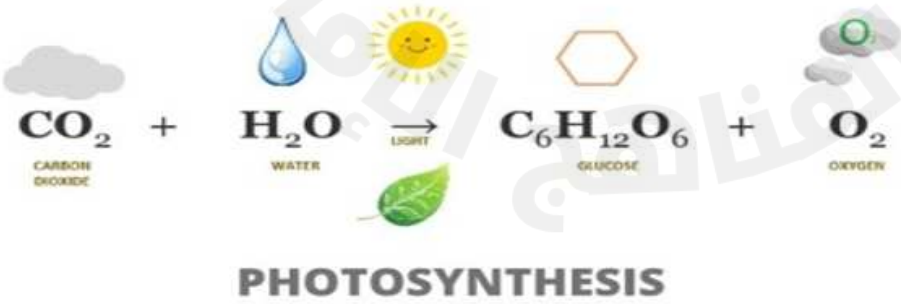
Carbon dioxide combines with hydrogen atoms from the splitting water molecules and form sugar molecules .

Plants can use this sugar as an immediate energy or can store it for later .

Potato and carrot are example for structures where sugar is stored



- Most chemical reactions requires input of energy
- In photosynthesis the light energy absorbed by chlorophyll
- When the light energy is absorbed ,it is used to splits water molecules



- Plants and other photosynthesis organisms absorb carbon dioxide and produce oxygen
- This is important for the ecosystem
- ECOSYSTEM: is all living or nonliving things in a given area

- all organisms requires energy to survive
- Energy is in the chemical bonds of food molecules
- but how can the organism use this energy ?!

Cellular respiration

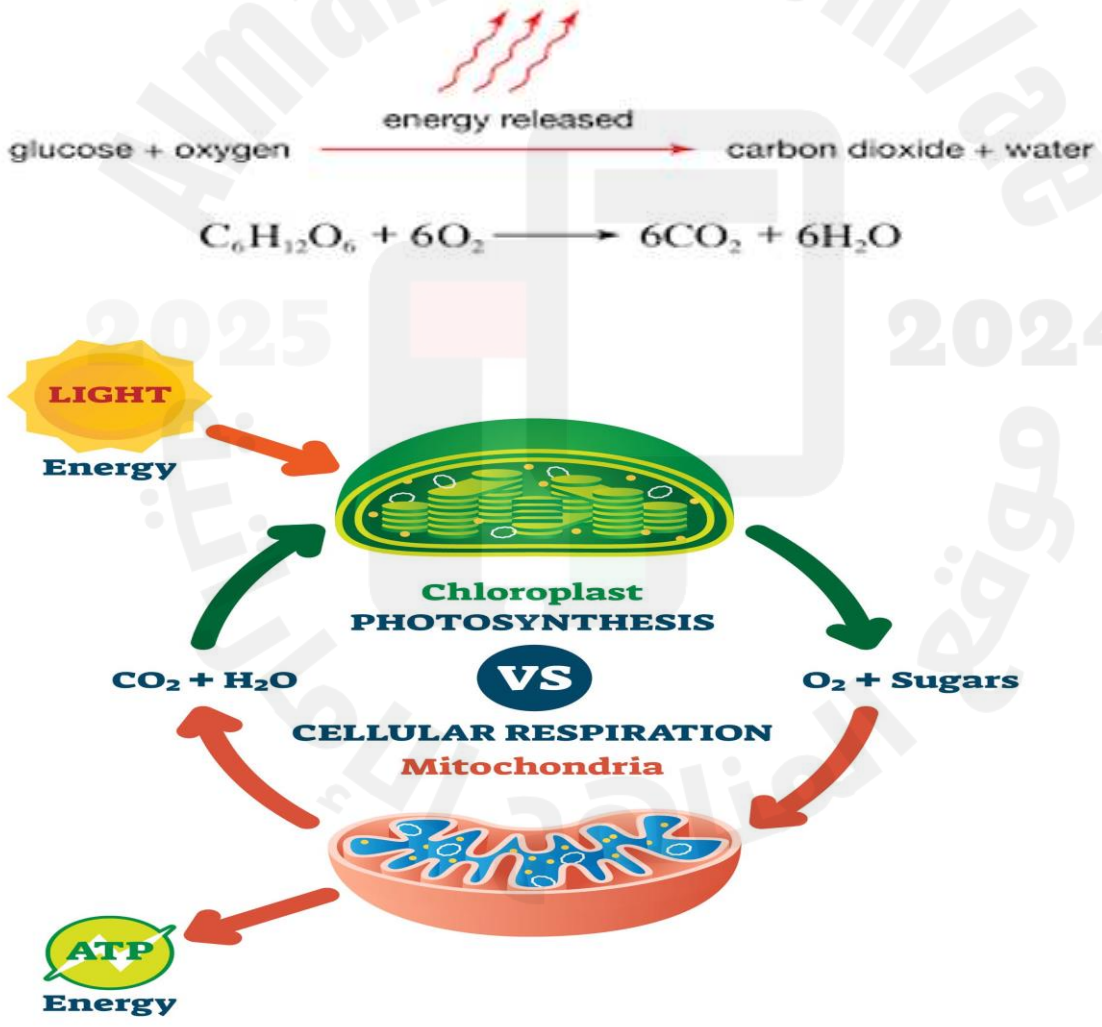
- When we breathe out we breath out carbon dioxide
- The carbon dioxide is a waste came from a process that release energy from molecules
- CELLULAR RESPIRATION : is a series of chemical reactions that convert energy in food molecules into useable form of energy called ATP
- Cellular respiration occur in tow parts of the cell 1) mitochondria 2)cytoplasm

Glycolysis

- It is the first step of cellular respiration
- It occur in cytoplasm of all cells
- Glycolysis : it is a process by which glucose (sugar) is broken down into smaller molecules
- It produces some ATP

- The second step of cellular respiration occur in the mitochondria of eukaryotic cell
- This step requires oxygen
- The smaller molecules made from glucose during glycolysis are broken down into large amount of ATP
- cell use The ATP to power cellule processes
- In this step , tow waste products – water and carbon dioxide .
- The CO2 released by cells as a waste products is used by plants and some unicellular organisms during photosynthesis

The release of energy during cellular respiration



- Photosynthesis requires the reactants carbon dioxide and water . The products are oxygen and glucose

- Photosynthesis is important to maintain the atmosphere we breath , it produce most of the oxygen in the atmosphere

- Cellular respiration requires the reactants glucose and oxygen to produce carbon dioxide and water and release energy
- Most organisms perform cellular respiration , it is important because if your body didn't break down and rearrange the food you eat, you wouldn't have energy to do anything . Same for the other organisms .

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Review

1. Photosynthesis is to chloroplasts as cellular respiration is to

   a) cytoplasm
   b) mitochondria
   c) nucleus
   d) chloroplast

2. Which process uses sunlight?

   a) photosynthesis
   b) cellular respiration

3. Which process makes glucose?

   a) cellular respiration
   b) photosynthesis

4. Cellular respiration occurs in both animal and plant cells.

   a) true
   b) false

5. What role does sunlight play in photosynthesis?

   a) warmth
   b) evaporation
   c) does not play a role
   d) energy

6. What are the inputs (reactants) of photosynthesis?

   a) oxygen and glucose
   b) carbon dioxide, water, sunlight
   c) sugar and yeast
   d) soil and nutrients

7. Which of the following is the best description of the process photosynthesis?

a) Glucose, oxygen, and light are inputs while carbon dioxide and water are outputs.
b) Water, carbon dioxide, and light are inputs while oxygen and glucose are outputs.
c) Water, oxygen, carbon dioxide, and light are inputs and glucose is the output.
d) Water, oxygen, and light are inputs while carbon dioxide and glucose are outputs

8. The process by which sugar is converted into energy (ATP) by living organisms is called

a) photosynthesis
b) cellular respiration

9. The products of cellular respiration are

a) oxygen and sugar (glucose)
b) carbon dioxide, water, energy

10. The products of photosynthesis are

a) sugar (glucose), oxygen, water
b) carbon dioxide, water, energy

11. The reactants in photosynthesis are

a) sugar (glucose), oxygen
b) carbon dioxide, water

12. The green pigment in plants is called

a) chlorophyll
b) melanin

13. In which cell organelle does PHOTOSYNTHESIS take place?

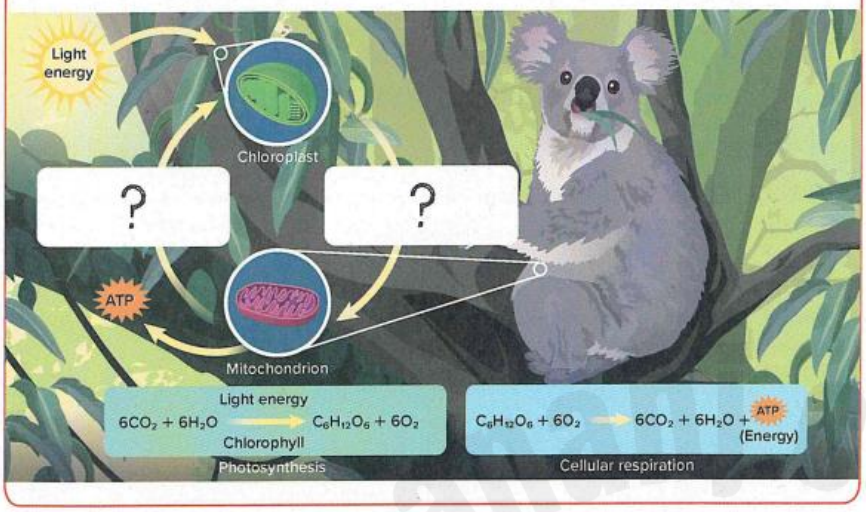
a) The golgi apparatus
b) The cytoplasm
c) The mitochondria
d) The chloroplast

14. Where in the cell does cellular respiration take place?

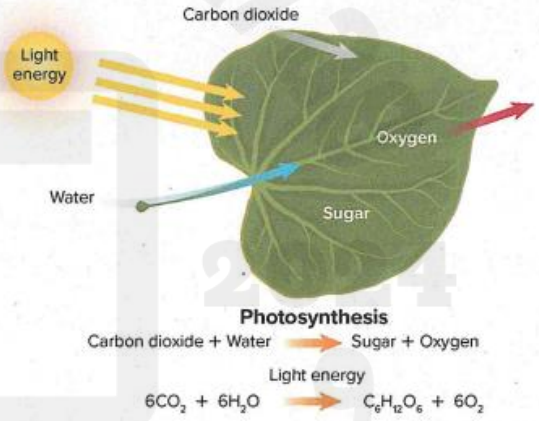
a) The cell wall
b) The chloroplasts
c) The mitochondria
d) The golgi apparatus

THREE-DIMENSIONAL THINKING

Think about how you would label the image of the system below to track the energy transfer in photosynthesis and cellular respiration. Write the labels in your Science Notebook.



Use the model to answer question 2.



2. Which is the best explanation of the change in energy shown in the model?

   A New energy is produced by plants during photosynthesis.

   B Large amounts of energy are released into the environment during photosynthesis.

   C Energy from sunlight is destroyed as it powers photosynthesis

   D Energy input from the environment is stored in food molecules during photosynthesis.

3. **EARTH SCIENCE Connection** In recent decades, average global temperatures have increased significantly. Scientists agree that the widespread destruction of the Amazon rain forest contributes to climate change. Which mechanism might be cited to support that hypothesis?

   A Deforestation causes water on the ground to reflect sunlight.

   B Deforestation reduces the number of plants able to absorb carbon dioxide.

   C Photosynthesis produces energy, which gives off heat.

   D Plants use up energy during cellular respiration.

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