LABEL THE NEXT 2 PAGES CELLULAR ENERGY AND COMPLETE THE QUESTION BELOW ON THE LEFT SIDE

Four friends were comparing their ideas about plant processes. This is what they said:

Hildy: I think plants carry on photosynthesis but not cellular respiration.

Flo: I think plants carry on cellular respiration but not photosynthesis.

Al: I think plants carry on both cellular respiration and photosynthesis.

Tamir: I think plants carry on neither photosynthesis nor cellular respiration.

With whom do you agree most? _____ Explain why you agree with that person.

- Tim & Moby!

Photosynthesis & Respiration

What is Photosynthesis?

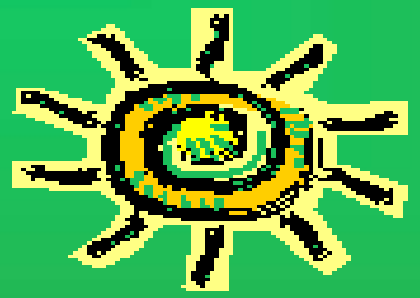
The ***process*** of photosynthesis is a **chemical reaction**.

Organisms, such as plants, use photosynthesis to make food

What do plants need for photosynthesis?
REACTANTS

- Water H_2O
- Carbon dioxide CO_2
- Light
- Chlorophyll – green pigment in chloroplasts

What is the equation for the chemical reaction of photosynthesis?



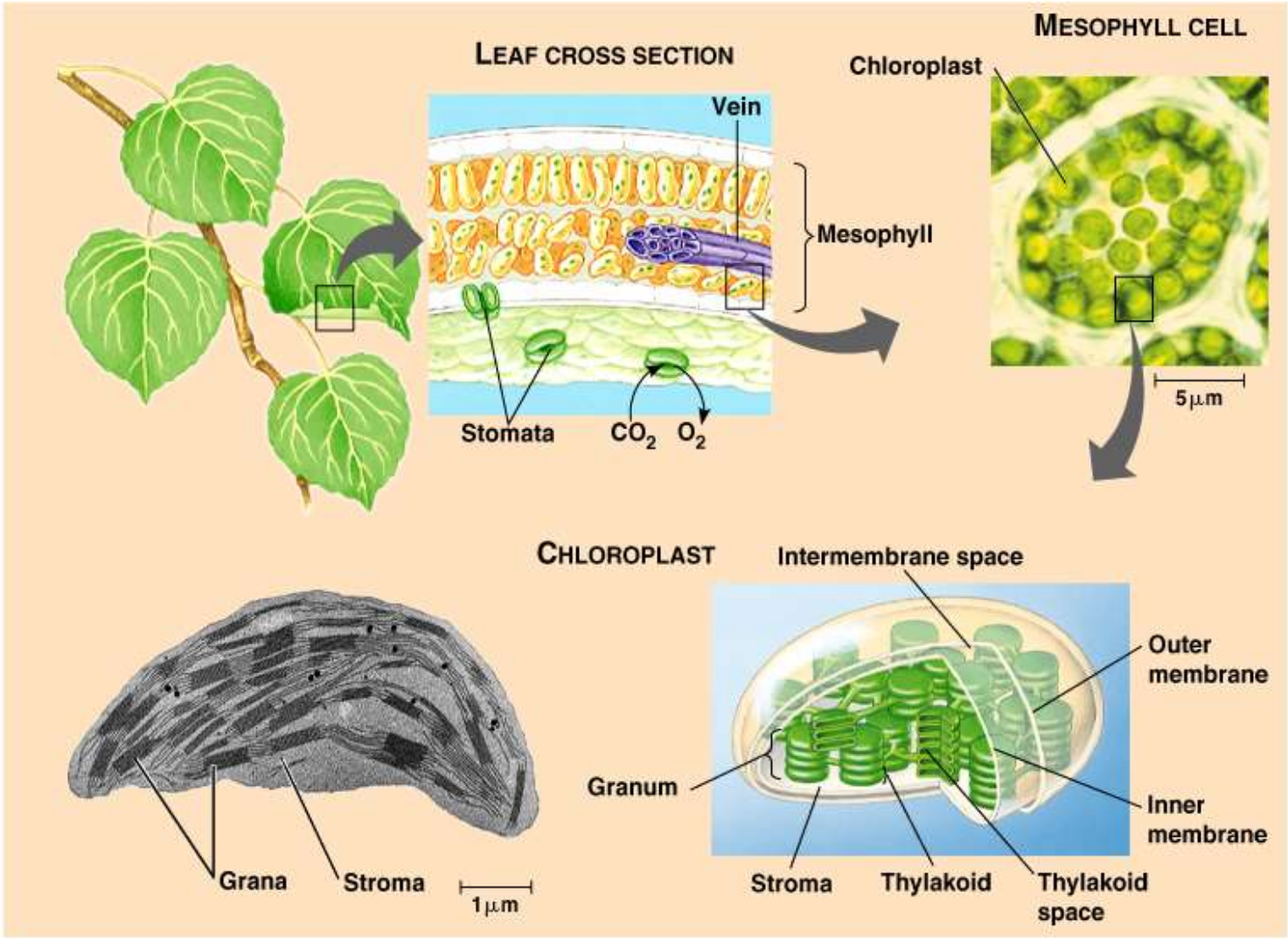
Light Energy

Carbon Dioxide + Water → Glucose + Oxygen

$$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$$

Describe Photosynthesis

- The process of changing light energy to chemical energy
- Energy stored as sugar
- Occurs in plants and some algae
- Plants need light energy, CO_2, and H_2O
- Takes place in the **chloroplasts**, using **chlorophyll**, the green pigment in plants



What are the PRODUCTS of photosynthesis?

- High-energy sugars (FOOD) $C_6H_{12}O_6$
- Oxygen O_2

Why is this important to us?

- We cannot make our own food (glucose, energy), we must get our food from plants.
- Plants are the first step in the food chain.
- The oxygen released during photosynthesis is necessary for all living things.

What is Cellular Respiration?

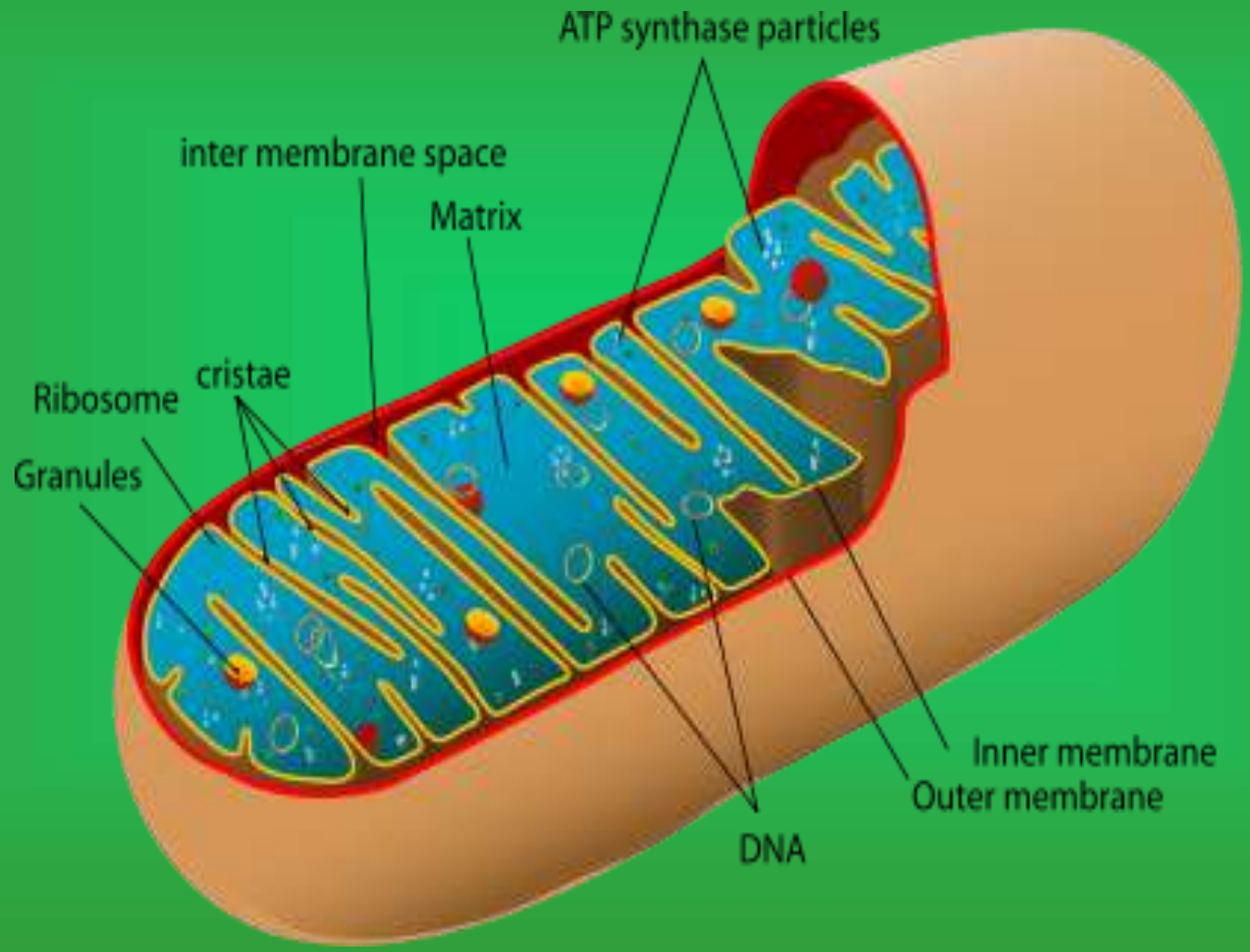
- **Cellular respiration is the process that releases energy by breaking down food molecules in the presence of oxygen.**

Describe Cellular Respiration

- The breakdown of glucose molecules to release energy
- Takes place in all living things

Where does cellular respiration happen?

- **In the mitochondria of living things.**


ATP synthase particles
inter membrane space
Matrix
cristae
Ribosome
Granules
Inner membrane
Outer membrane
DNA

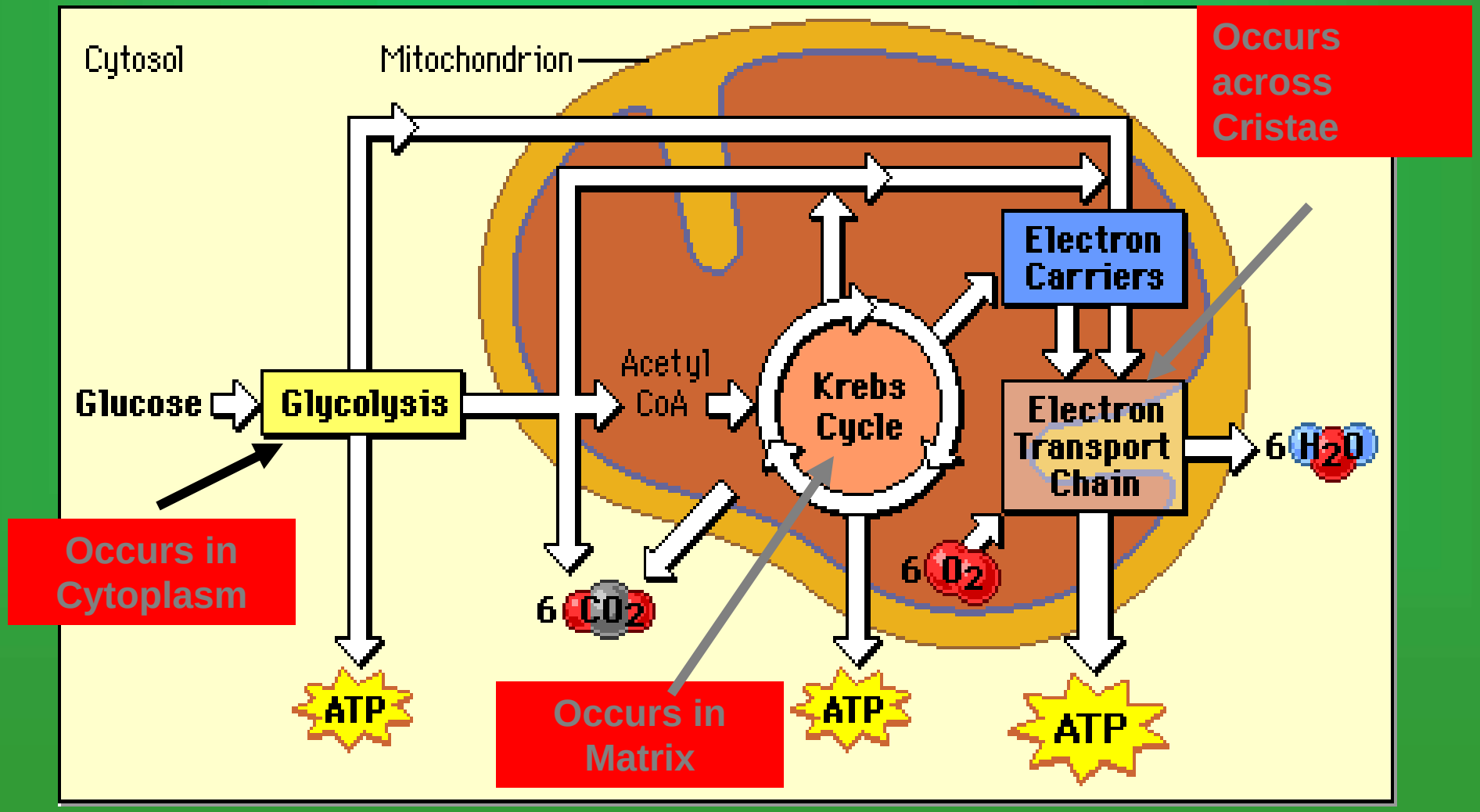
What is the chemical equation for cellular respiration?

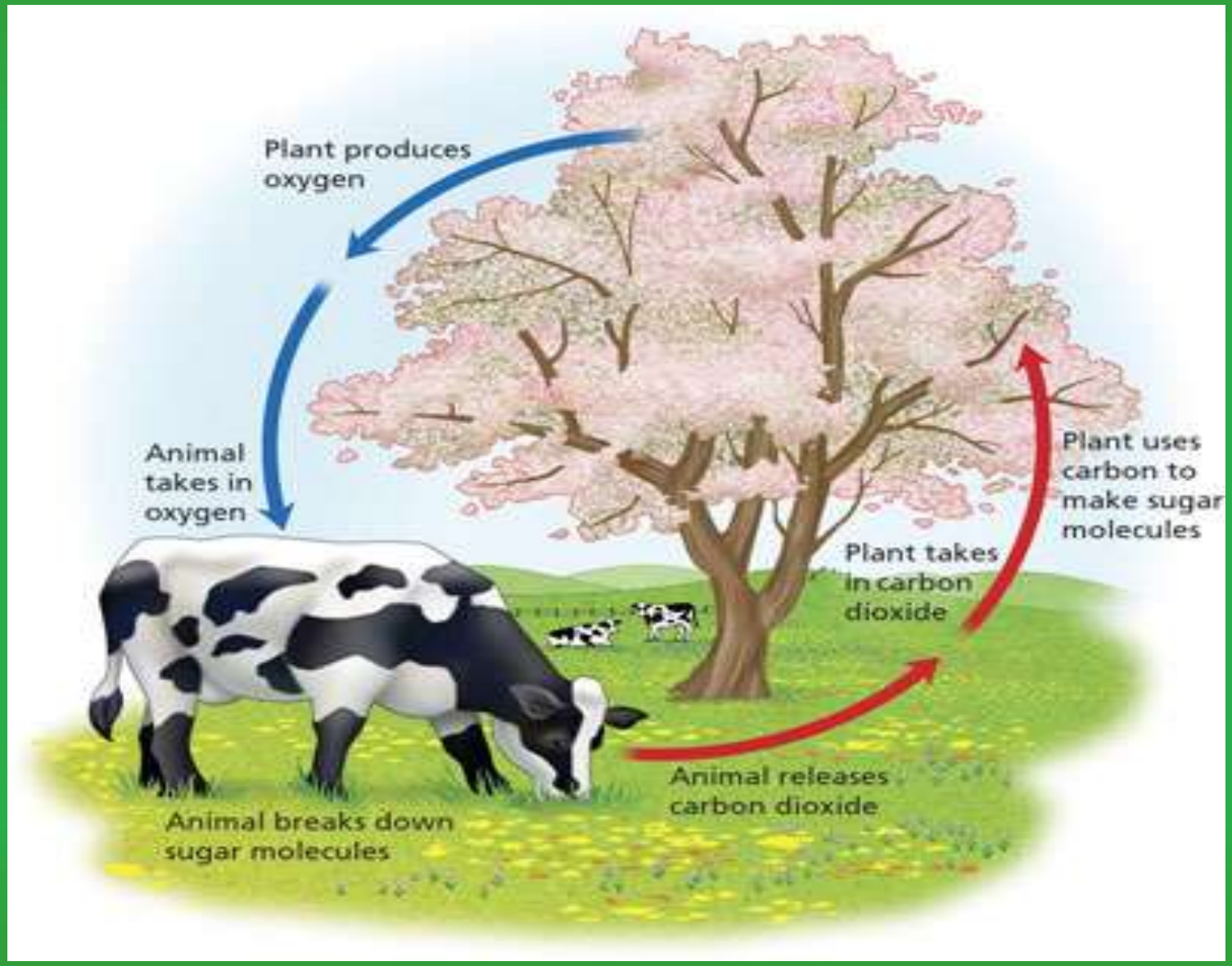
The chemical equation for respiration is:

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

Glucose + Oxygen → Carbon Dioxide + Water

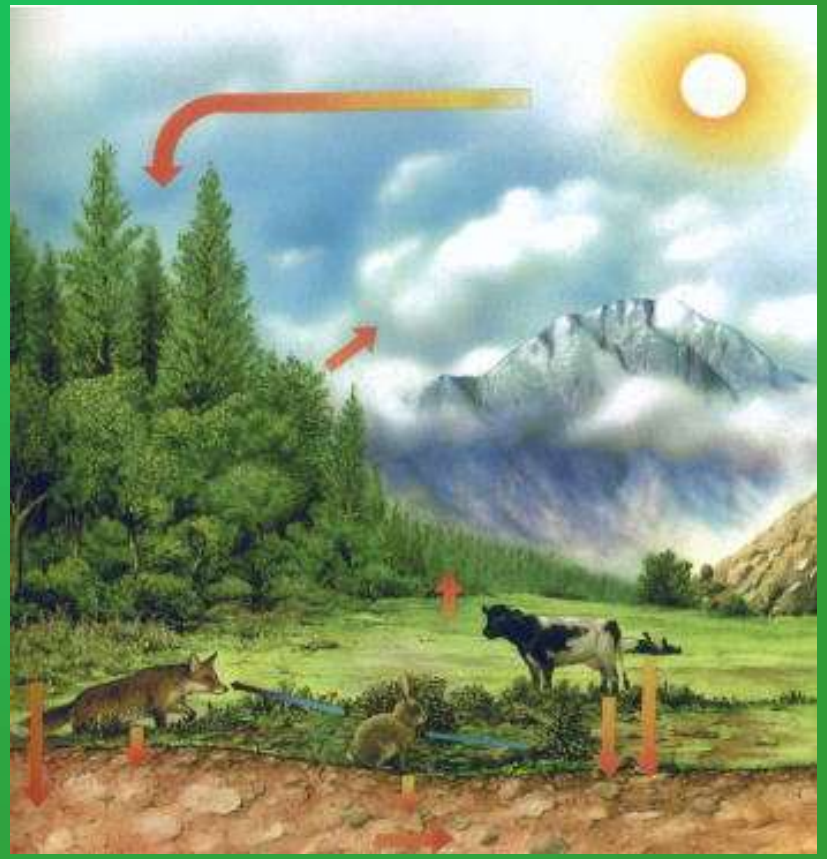
Diagram of the Process




Plant produces oxygen
Animal takes in oxygen
Plant uses carbon to make sugar molecules
Plant takes in carbon dioxide
Animal releases carbon dioxide
Animal breaks down sugar molecules

Complementary processes

- Photosynthesis is an important part of the carbon cycle.
- The processes of photosynthesis and cellular respiration are complementary processes



Laws of Conservation of Energy & Mass

- No mass is created or destroyed in Photosynthesis or Cellular Respiration!
- No energy is created or destroyed in Photosynthesis or Cellular Respiration
  - Sunlight makes glucose (sugar) chemical energy.
  - Cellular Respiration releases energy stored in glucose (sugar)

Identify the cell parts. Hint: blue arrows are organelles in animals. Yellow arrows are for organelles in plants only.
(Click to check your answers)