Erasmus+
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ALIVE

Plant respiration

World of plants

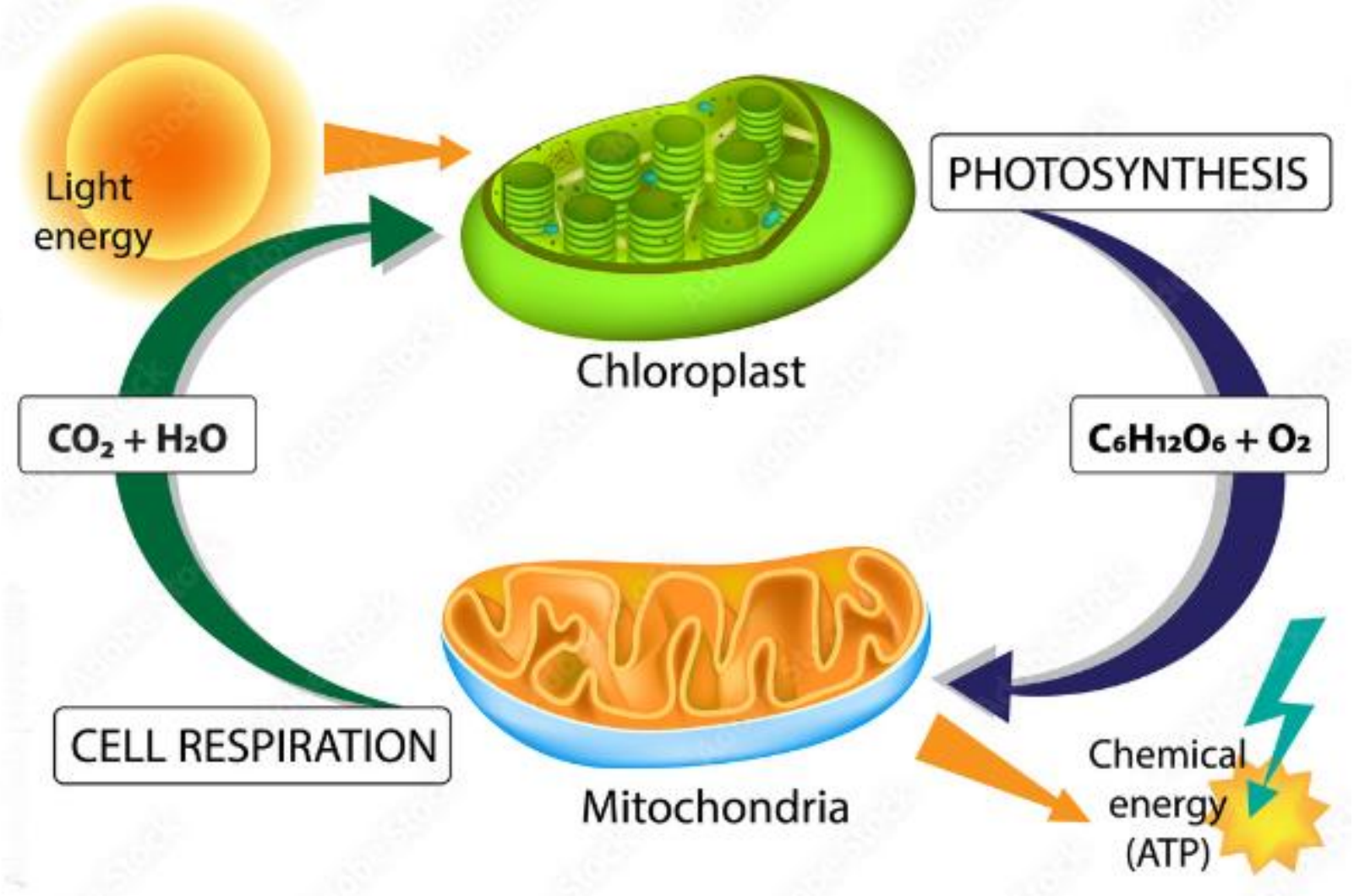
HOW DO PLANTS BREATHE?

ALIVE

- Plants are characterized by photosynthesis = intake of CO_2 and release of O_2 to form glucose
- In addition to the special feature (photosynthesis), plants also carry out another gas exchange - they breathe similarly to other organism

ALIVE

PLANT RESPIRATION



CHEMICAL NOTATION

- The chemical reaction of respiration is the opposite reaction of photosynthesis
- The plant receives oxygen and glucose is broken down, producing CO_2, H_2O and energy, which is used for the plant's metabolic and physiological processes

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

Breathing = respiration

= gas exchange between organisms and the external environment

By breathing we mean the intake of oxygen and the output of carbon dioxide and water

Energy is released during breathing

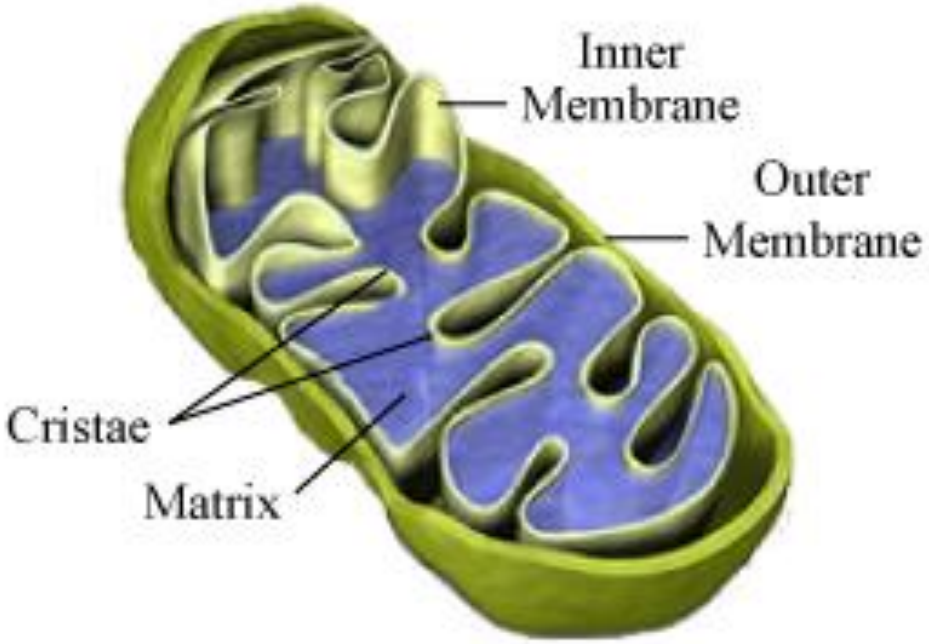
Breathing is called respiration

THE PROCESS OF BREATHING

- The process of respiration is accompanied by the splitting of complex substances into simple ones
- It is a multi-step process and contains many intermediate products
- Respiration of plants takes place under aerobic conditions - in the presence of oxygen (they receive it in the process of breathing)

AEROBIC RESPIRATION

- It takes place in the mitochondria, which are considered the energy-respiration center of the cell

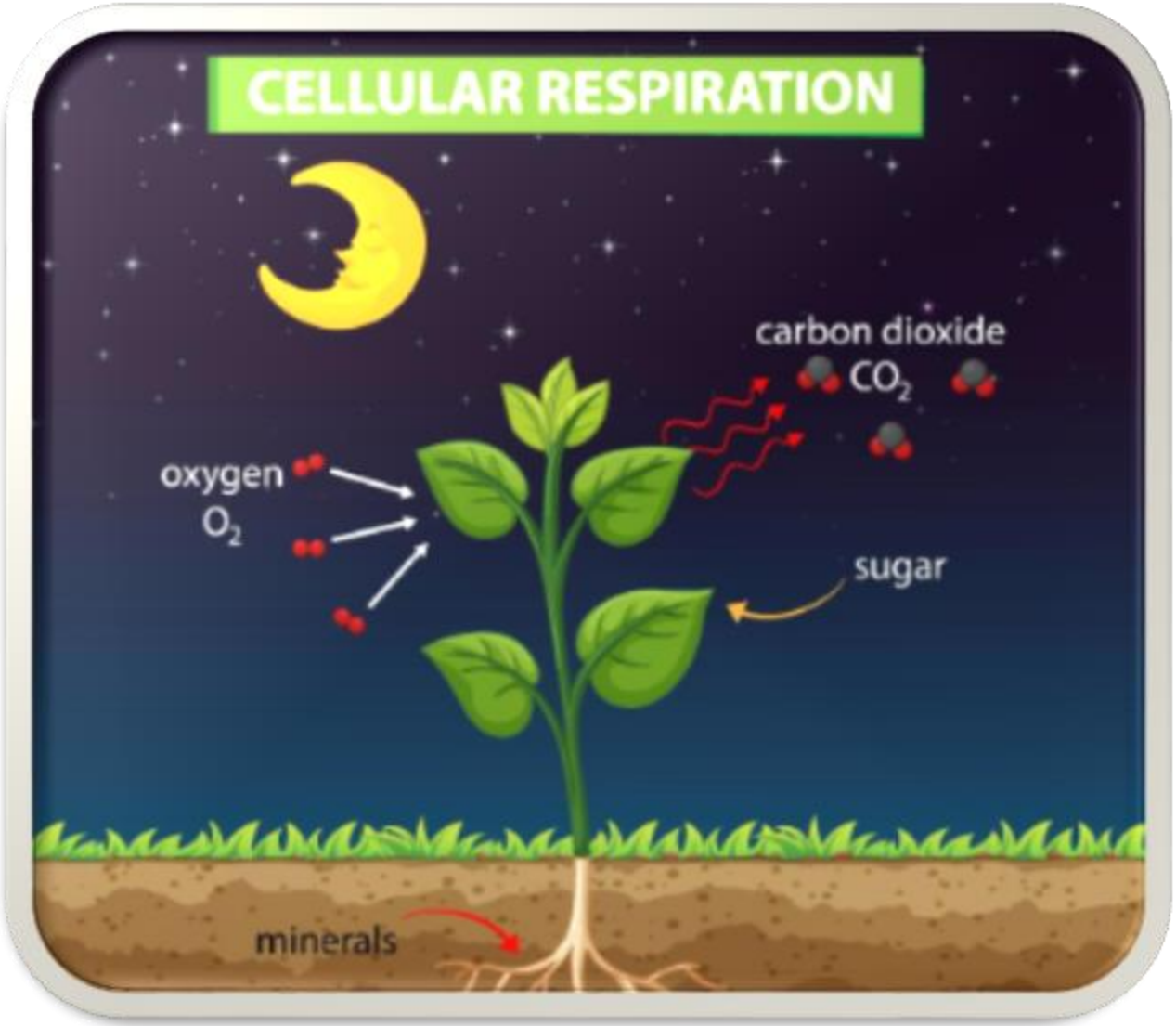


AEROBIC RESPIRATION

- Glucose is split into 2 three-carbon compounds = pyruvic acid (it still has a lot of energy) - transport to the mitochondria - formation of acetyl coenzyme A - a complex reaction of the Krebs cycle follows, in which an electron is released and the acetyl group is oxidized to CO_2

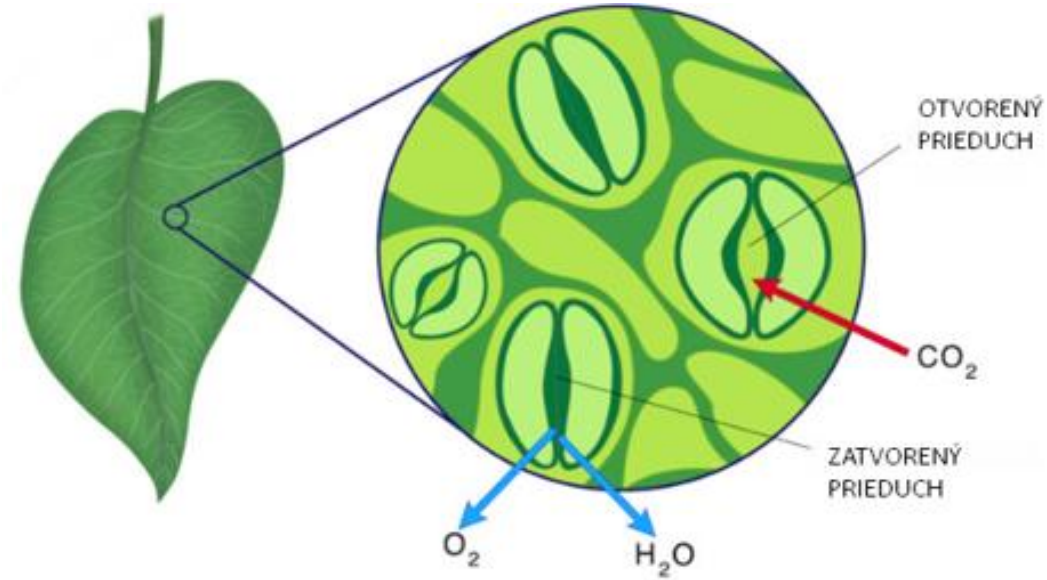
CELLULAR RESPIRATION

ALIVE



WHAT DO PLANTS BREATHE?

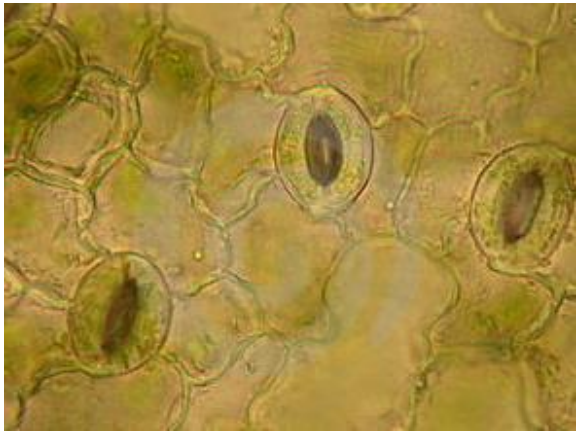
- The plant organs that ensure respiration = gas exchange are mainly LEAVES
- Leaves have vents on the underside



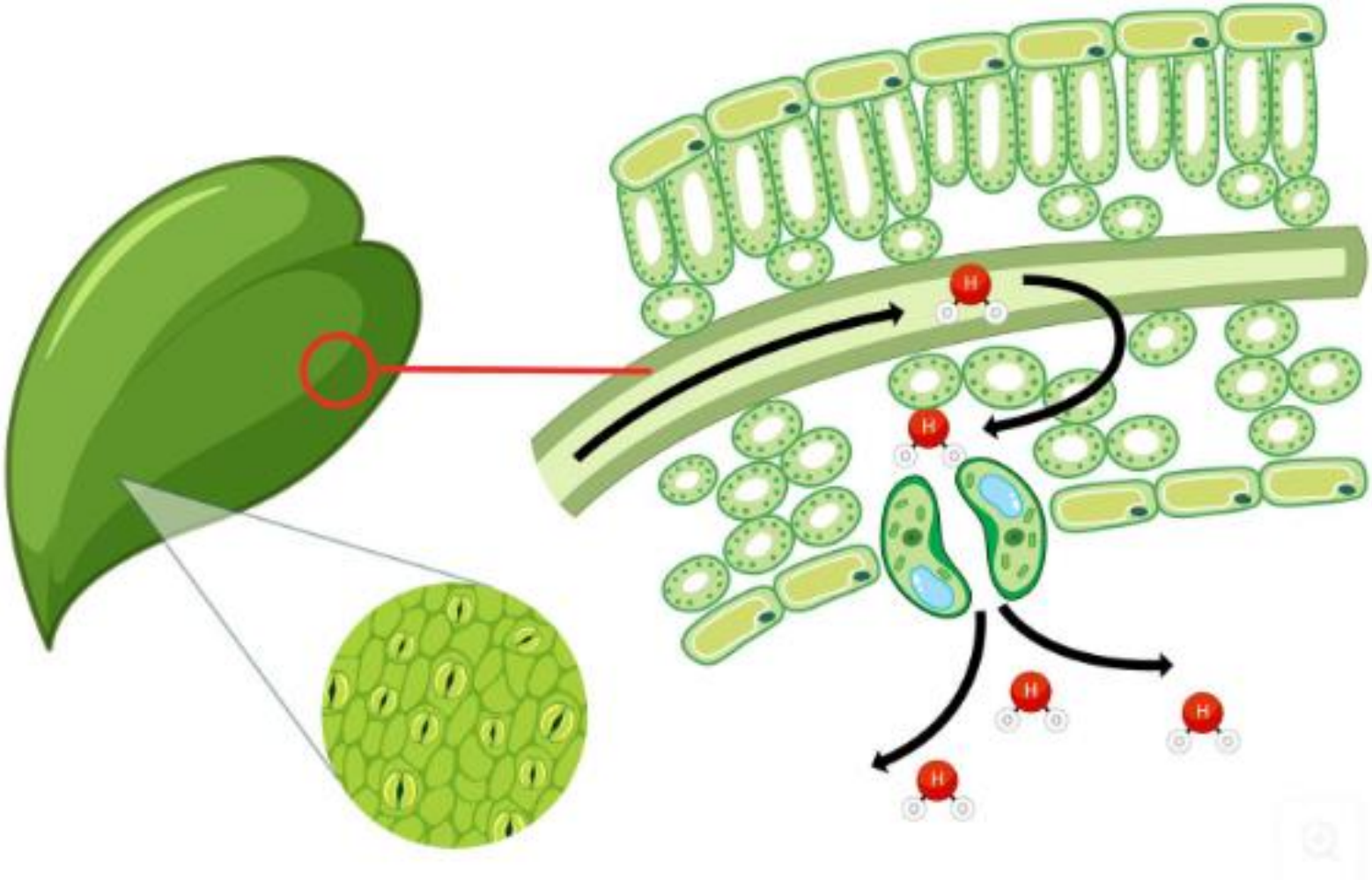
WHAT DO PLANTS BREATHE ?

- Vents:

- are formations on the underside of the leaves
- they allow gas exchange
- they are bean-shaped
- they can open and close, and thus
- they regulate gas exchange



WHAT DO PLANTS BREATHE ?

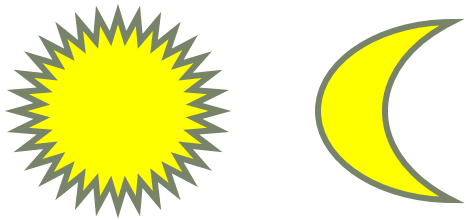


WHY DO PLANTS TO BREATHE?

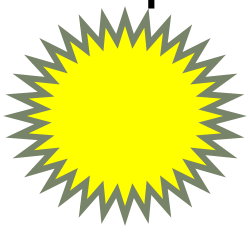
- Because breathing releases the energy necessary for the life of the plant
- Without this energy, all vital processes such as growth, reproduction, the formation of flowers and fruits, the formation of organic substances, the intake and output of substances could not take place

WHY DO PLANTS HAVE TO BREATHE?

- In order for all vital functions to function properly, the plant breathes CONSTANTLY = day and night, in the light and in the dark



- Unlike photosynthesis - photosynthesis takes place only if solar energy is present = it requires light - so it takes place during the day



- Photosynthesis does not take place at night

DOES A PLANT BREATHE EVEN WHEN IT IS PHOTOSYNTHESIZING AT THE SAME TIME?

- Photorespiration = respiration that takes place in the presence of light at the same time as photosynthesis
- During photorespiration, part of the organic substances produced in the process of photosynthesis is immediately consumed

FACTORS INFLUENCING PLANT RESPIRATION

ALIVE

- External factors:

Light, temperature, amount of water, nutrients and minerals

- Internal factors:

Anatomical, morphological and structural characteristics of the assimilation organs (type of plant and type of leaves)

PICTURES - USED SOURSES:

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