



3 Processes Necessary for Plants to Survive

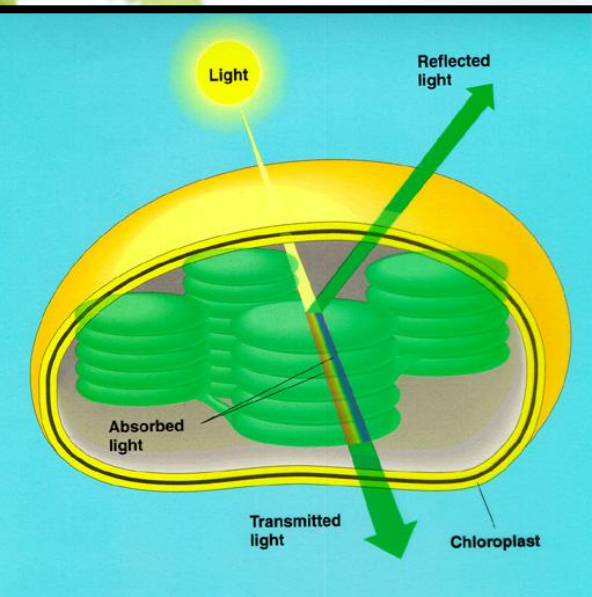
6-2.7 Summarize the processes required for plant survival (including photosynthesis, respiration, and transpiration).

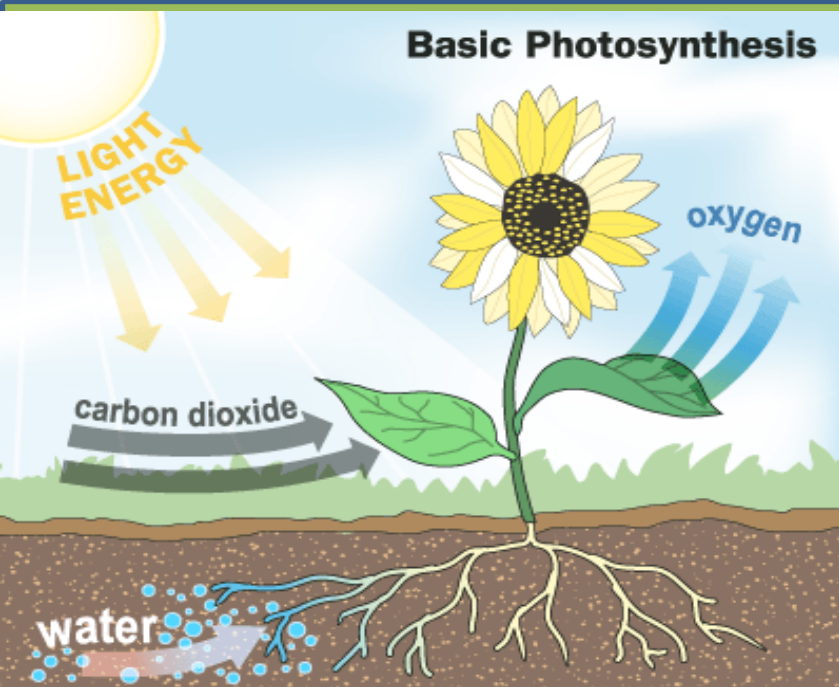
Photosynthesis

(make food)

Photosynthesis is the process by which plants make their own food, a simple sugar, for survival.

- **Chloroplasts** in the cell contain the **chlorophyll**.
- The chlorophyll is a **green pigment** that absorbs the light energy from the sun.
- **Sunlight** provides the **energy** for the process of photosynthesis.





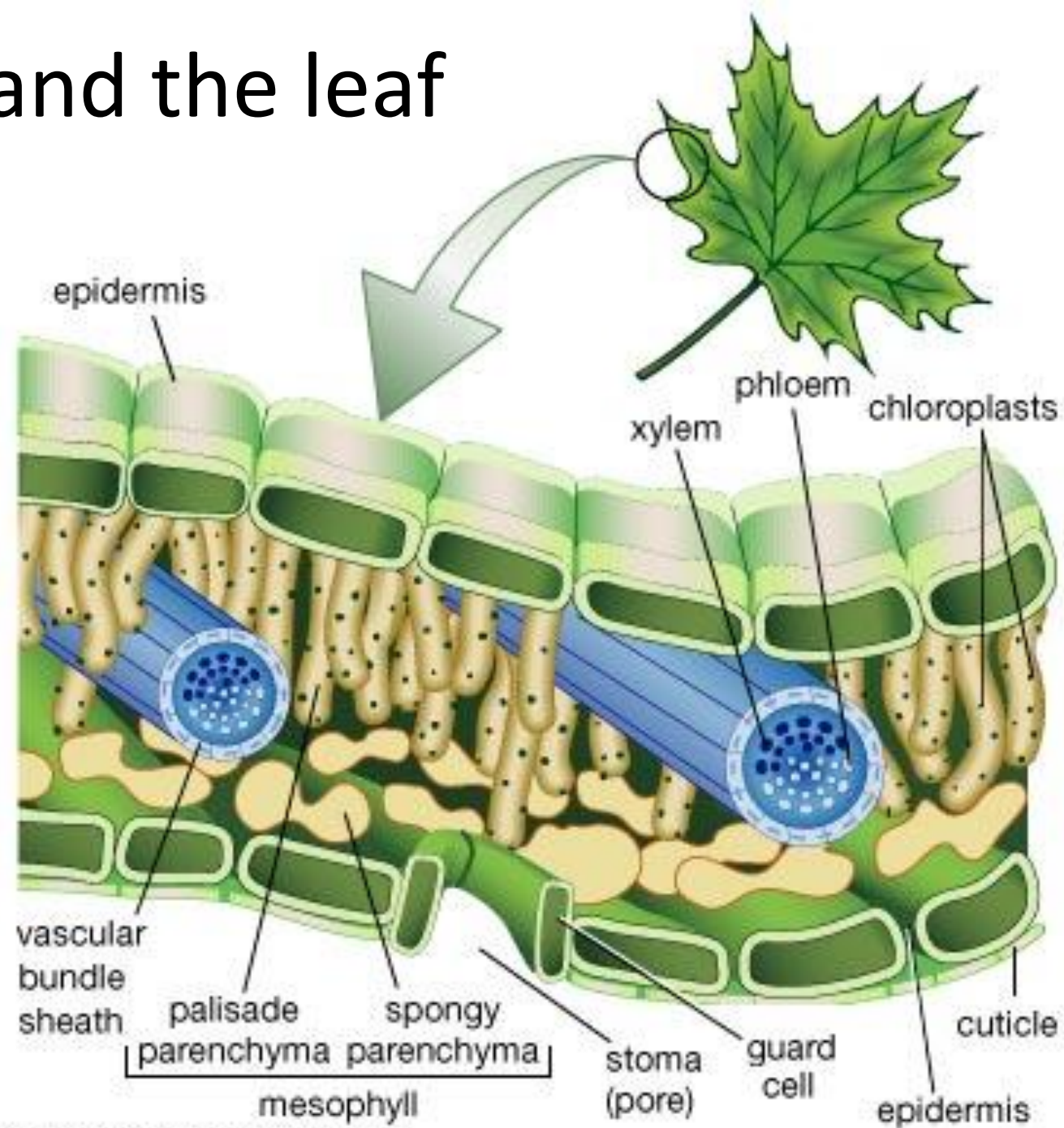
Photosynthesis

(make food)

- **Water** and **carbon dioxide** are used to make the **sugar** and **oxygen**.
- Oxygen is released through openings in the leaf called **stomata**.
- Photosynthesis provides the **oxygen** in the atmosphere that living things need.

Stomata and the leaf

Stomata are pores found mostly on the underside of leaves. **Gasses** pass through these pores during **photosynthesis** and **respiration**. **Guard cells** on either side of the pore **open** and **close** to prevent the escape of water during **transpiration**.



Respiration

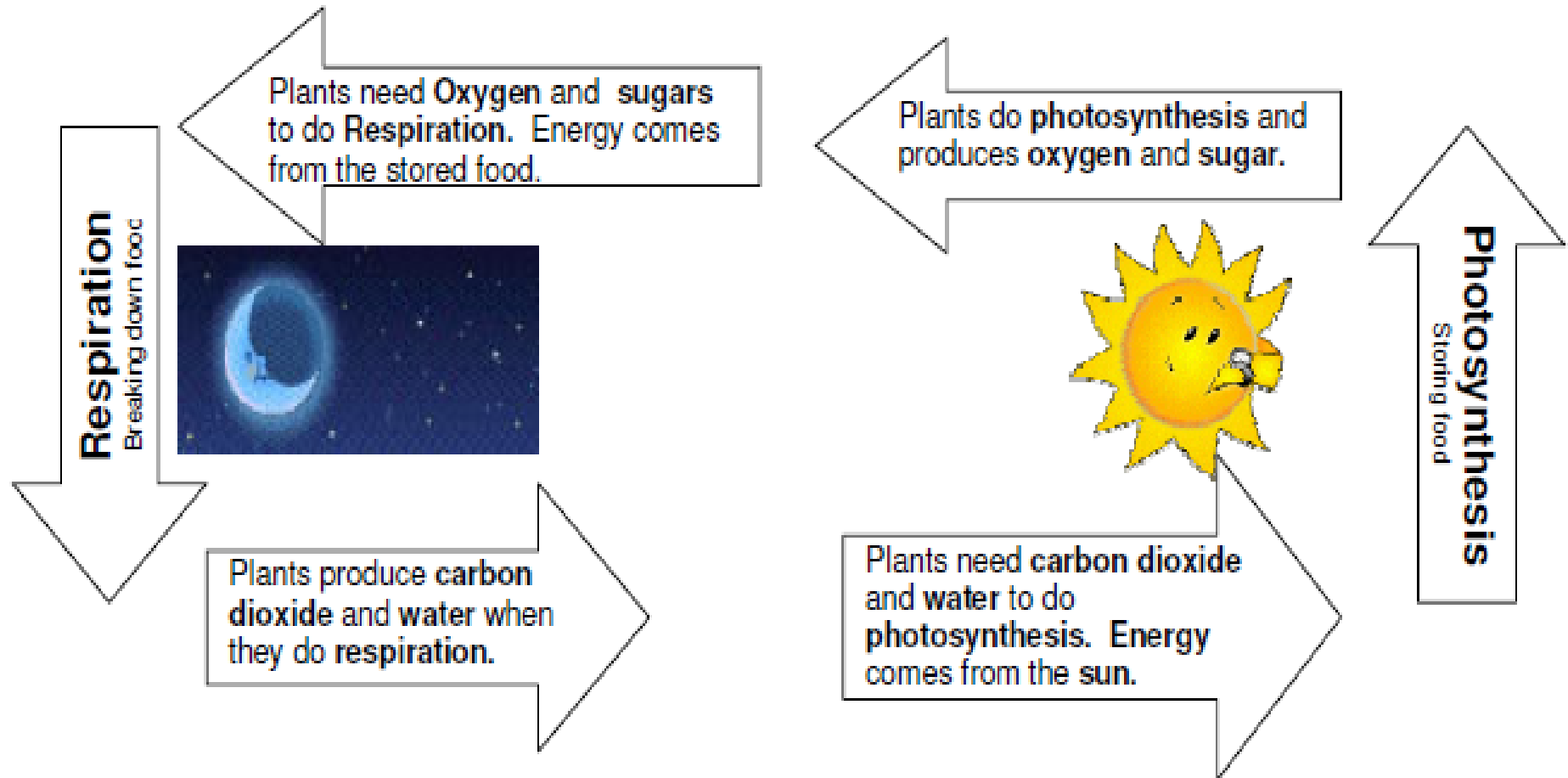
(break down food)

Respiration is when plants or animals break down sugar and use the energy to perform life functions

- The food (**sugar**) created through photosynthesis provides the plant with energy to perform life functions.
- To get energy from the food it produces, plants must **break down the sugar** through **respiration**.
- **Oxygen** from the air combines with the **sugar** and produces **carbon dioxide and water**. **Energy** is released so it can be used by the plant.
- **Carbon Dioxide** and **water** are given off through the **leaves**. (This process is the opposite of photosynthesis.)



Photosynthesis and Respiration





Comparison of Photosynthesis & Respiration

Photosynthesis

Produces sugars from energy

Energy is stored

Occurs only in cells with chloroplasts

Oxygen is produced

Water is used

Carbon dioxide is used

Requires light

Respiration

Burns sugars for energy

Energy is released

Occurs in most cells

Oxygen is used

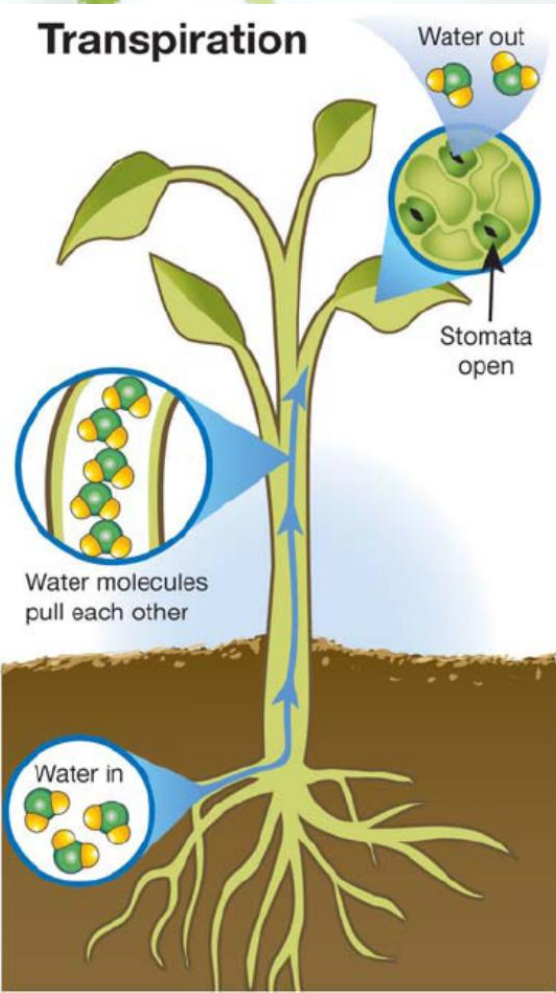
Water is produced

Carbon dioxide produced

Occurs in dark and light



Transpiration



Transpiration

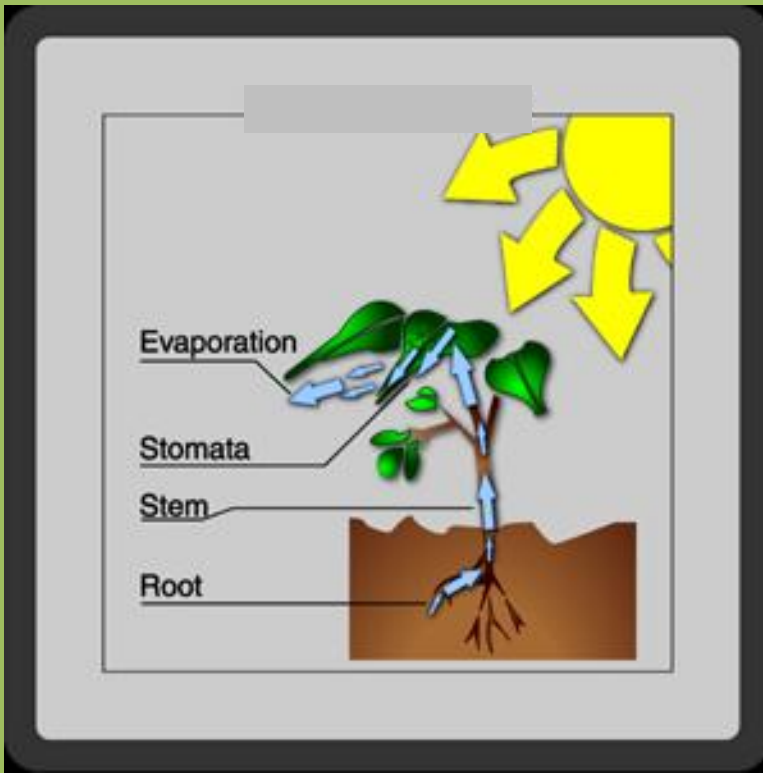
(save water)

Transpiration is when plants lose water through the leaves.

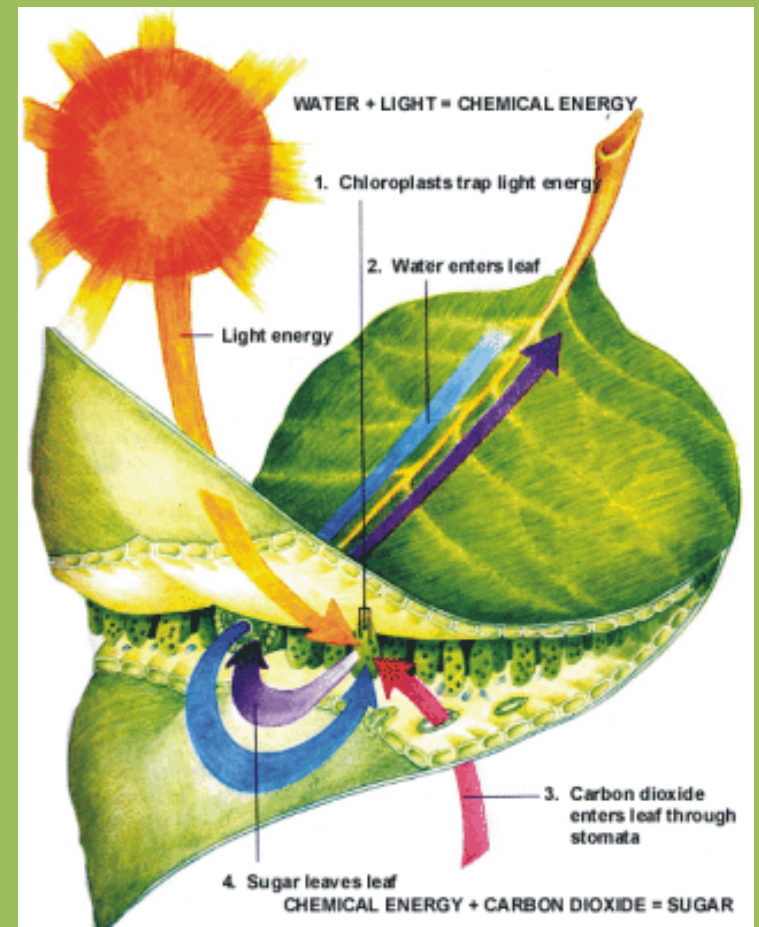
- Plants lose most of their water through their **leaves**, the other water is used in photosynthesis.
- Plants must **control** the amount of water they lose through leaves or they would **wither and die**.
- Plants slow down transpiration by closing **stomata (pores)** on the underside of the leaves.
- **Guard cells** open and close the stomata to keep water from escaping from the leaf. Closed **stomata** keep water from escaping from the leaf.

How does respiration and transpiration effect photosynthesis?

Transpiration



Photosynthesis



Review Questions

1. Which statement about photosynthesis and respiration is accurate?

- a. Photosynthesis stores energy and respiration releases energy.
- b. Respiration stores energy and photosynthesis releases energy.
- c. Photosynthesis and respiration are the same process.
- d. Photosynthesis and respiration do not have anything to do with energy.

2. The main function of the leaf is to:

- a. use sunlight to make food.
- b. to store water and minerals.
- c. to transport water and minerals.
- d. to make plants green.

Review

Photosynthesis

Two short videos