

Topic: How Plants Make and Use Food — Photosynthesis, Respiration & Transpiration

Plants are living things that need energy to grow, repair, and reproduce. They can't hunt like animals, so they make their own food through a process called photosynthesis.

- Where it happens: Inside plant cells are tiny “kitchens” called chloroplasts. These contain chlorophyll, a green pigment that captures sunlight.
- What plants need:
 - 1) Sunlight (energy source)
 - 2) Carbon dioxide (CO₂) (from the air)
 - 3) Water (H₂O) (from the soil)
- What plants make:
 - Glucose (a simple sugar = plant food/energy)
 - Oxygen (O₂) (released into the air)

Simple word equation:

Carbon dioxide + Water + Light → Glucose + Oxygen

How CO₂ and O₂ move in/out:

Leaves have tiny pores called stomata (singular: stoma). They open and close to let gases in and out and to reduce water loss.

What plants do with glucose:

- Use it right away for energy.
- Store it as starch in leaves, stems, roots, or seeds for later.

Do plants also “breathe”?

Yes—plants perform cellular respiration in their mitochondria. Respiration breaks down glucose using oxygen to release energy that cells can use. Plants do respiration all the time (day and night).

- Photosynthesis: stores energy *in* glucose (needs light).
- Respiration: releases energy *from* glucose (happens 24/7).

Transpiration:

Plants also lose water vapor through the stomata—this is called transpiration. It helps pull water upward from roots and cools the plant, but too much transpiration can dry a plant out, so stomata balance gas exchange and water loss.

Big picture:

- Daytime: Photosynthesis (big), respiration (always).
- Night: No photosynthesis without light, but respiration continues.
- Result: Plants feed themselves, release oxygen, and form the base of most food chains.