

Leaf Food Factory

Trace how a leaf uses matter and energy to make food.

SC.8.L.18.1 "Describe and investigate the process of photosynthesis, such as the roles of light, carbon dioxide, water and chlorophyll; production of food; release of oxygen."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each input photosynthesis needs, circle each product it makes, and put a star beside the sentence that explains chlorophyll's role.

A Bean Plant at Work

- ① On a sunny morning, a bean plant does more than stand still. Inside the green parts of its leaves, cells contain chlorophyll, a pigment that absorbs light energy. The leaf also has tiny openings that let carbon dioxide from the air move into internal spaces. Water travels upward from the roots through tubes in the stem and into the leaves. There, water and carbon dioxide meet captured light energy, and photosynthesis can occur.
- ② Within chloroplasts, chlorophyll captures energy from light. That energy helps rearrange carbon dioxide and water into glucose, a sugar the plant can use as food. Glucose stores chemical energy that can support growth, repair, and other cell activities. The plant may use some glucose right away or combine it into larger substances for storage or structure. Photosynthesis does not create energy; it changes light energy into chemical energy held in food. This transformation makes leaves important food-making sites.
- ③ As glucose forms, oxygen is produced and can move out of the leaf through its tiny openings. This oxygen enters the air, where animals and many other organisms can use it for cellular respiration. Photosynthesis needs suitable conditions. Without light, chlorophyll cannot capture the energy needed for the process. Without enough water or carbon dioxide, the plant lacks reactants for making glucose. A wilted plant may have trouble moving water to its leaves. At night, light is absent, so photosynthesis stops.

2 ANSWER WITH EVIDENCE Use the passage

1 How do carbon dioxide and water reach the leaf for photosynthesis?

2 What does chlorophyll do during photosynthesis?

3 How does photosynthesis change light energy into food for the plant?

4 What happens to the oxygen produced during photosynthesis, and why is its release important?

3 YOUR TURN Your own words

Make a three-panel sketch that traces photosynthesis in one leaf. Use arrows and labels to show where light, carbon dioxide, and water come from, how glucose forms, and where oxygen goes.

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PART 1 • READ AND MARK

Underline each input photosynthesis needs, circle each product it makes, and put a star beside the sentence that explains chlorophyll's role. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How do carbon dioxide and water reach the leaf for photosynthesis?	Carbon dioxide enters through tiny leaf openings. Water travels from the roots through tubes in the stem to the leaves.
2	What does chlorophyll do during photosynthesis?	Chlorophyll absorbs or captures light energy.
3	How does photosynthesis change light energy into food for the plant?	Captured light energy helps rearrange carbon dioxide and water into glucose. The glucose stores chemical energy as food.
4	What happens to the oxygen produced during photosynthesis, and why is its release important?	Oxygen moves out of the leaf through tiny openings and enters the air. Animals and many other organisms can use it for cellular respiration.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: Light reaches chlorophyll in a leaf. Carbon dioxide enters from the air, and water arrives from the roots. Panel 2: Chlorophyll uses light energy to help make glucose from carbon dioxide and water. Panel 3: Glucose becomes food for plant cells, and oxygen leaves the leaf and enters the air.

Accept equivalent descriptions of inputs, chlorophyll's light-capturing role, glucose production, and oxygen release. In the sketch, check that arrows show all three inputs entering the process, glucose as food, and oxygen moving to the air.