How Do Plants Get Food for their Growth?

A. Fill in the Blanks

Complete the sentences with the correct word from the word bank.

chemical glucose light carbon dioxide chlorophyll

1. The green pigment in leaves that absorbs energy from the sun is called _____.
2. Plants take in _____ from the air through tiny pores in their leaves.
3. The food that plants produce is a type of sugar called _____.
4. Photosynthesis converts _____ energy into _____ energy.
5. (This question uses a word not in the bank) The tubes that transport water up the stem are called the _____.

B. Match the Following;

Match the term in Column A with its correct description or function in Column B.

Column A (Structure)	Column B (Function)
1. Chloroplast	A. The sugar/food produced by the plant.
2. Stomata	B. The green pigment that captures sunlight.
3. Xylem	C. The organelle where photosynthesis occurs.
4. Glucose	D. Tiny pores on the leaf for gas exchange.
5. Chlorophyll	E. Tubes that transport water from roots to leaves.
6. Phloem	F. Tubes that transport food (glucose) to other parts of the plant.

C. Practice Problems

Answer the following questions in more detail. Use complete sentences where necessary.

1. Write the full word equation for photosynthesis. _____ + _____ --- (in the presence of Sunlight & Chlorophyll) --> _____ + _____
2. What are the two main products that result from photosynthesis?
3. What is the function of the stomata on a leaf?
4. Explain how water travels from the soil all the way up to the leaves.
5. What are two things a plant might do with the glucose (sugar) it produces?
    - _____
    - _____
6. Why is sunlight essential for photosynthesis to occur?
7. What is the difference between an autotroph (like a plant) and a heterotroph (like an animal)?
8. What is the name of the specific organelle (part of the cell) where photosynthesis takes place?
9. Why are the leaves of most plants broad and flat?
10. What gas is released by plants as a waste product of photosynthesis?

D. Warm-up Questions

Answer the following basic questions to get your brain warmed up!

1. What is the scientific name for the process by which plants make their own food?
2. What part of the plant is the primary location for making food?
3. What is the green-colored substance in leaves that captures energy from the sun?
4. What do plants absorb from the soil through their roots that is essential for this process?
5. What gas do plants take in from the atmosphere to make their food?

E. Challenge Questions

Think critically to answer these more difficult questions.

1. If a plant's stomata were completely blocked by a layer of vaseline, how would this affect its ability to survive? Explain your reasoning.
2. Some plants, like the Venus flytrap, are carnivorous and eat insects. Why do they still need to perform photosynthesis if they can get nutrients from insects?
3. Explain the relationship between photosynthesis and cellular respiration in a plant. Do plants only photosynthesize, or do they respire too?

4. A scientist observes that a plant in a sealed container stops growing after a few days, even with plenty of light and water. What essential ingredient for photosynthesis has the plant likely used up?
5. Why is photosynthesis often called the most important chemical reaction on Earth? Give two reasons.

F. Word Problems & Application

Apply your knowledge to solve these real-world scenarios.

1. A gardener keeps one of her potted plants in a dark, windowless closet for two weeks, but she remembers to water it every day. Predict what will happen to the plant and why.
2. You are looking at an aquatic plant (like Elodea) in a fish tank on a sunny day. You notice tiny bubbles rising from its leaves. What gas are these bubbles most likely made of, and what process is creating them?
3. A farmer wants to grow lettuce faster in his greenhouse during the winter. Besides providing water and good soil, what is one thing he could change in the greenhouse environment to increase the rate of photosynthesis?
4. If you cover one leaf on a healthy geranium plant with aluminum foil for a week (blocking all light), what difference would you expect to see between that leaf and the other leaves on the plant?
5. Large-scale deforestation is the cutting down of huge forests. How could this practice affect the balance of oxygen and carbon dioxide in the Earth's atmosphere?

G. True or False

1. Plants get their food by absorbing it from the soil. _____
2. Photosynthesis can happen 24 hours a day. _____
3. The main purpose of photosynthesis is to produce oxygen for humans. _____
4. All parts of a plant (roots, stem, and leaves) can perform photosynthesis. _____
5. During photosynthesis, plants release carbon dioxide as a waste product. _____