Vocabulary

- Photosynthesis
- Chloroplast
- Grana
- Thylakoids
- Stroma
- Light-Dependent Reactions
- Light-Independent Reactions (Calvin Cycle)
- NADP+
- Chlorophyll
- ATP
- Cuticle
- Xylem
- Phloem
- Stomata
- Guard Cells

Cell Processes: Photosynthesis

1. What is photosynthesis? Describe the reactants and products of photosynthesis in words and in a chemical equation.

2. Why is photosynthesis essential to life?

3. What happens to the glucose that plants produce?

4. How is the relationship between photosynthesis and cellular respiration an indication of the interdependence of organisms?

5. Describe the relationship among the chloroplast, stroma, grana, and thylakoids.

6. Explain the difference between the light-dependent reactions and the light-independent reactions.

7. Explain how the light-dependent reactions generate ATP and NADPH.

8. Explain how the light-independent reactions generate glucose.

9. In 1941, biologists exposed photosynthesizing cells to water containing a heavy oxygen isotope, designated ^{18}O. The "labeled" isotope appears in the O_2 gas released in photosynthesis, showing that the oxygen came from the water. Where would the ^{18}O have ended up if the researchers had used ^{18}O-labeled CO_2 instead of H_2O?