

Lab 5. Temperature and Photosynthesis: How Does Temperature Affect the Rate of Photosynthesis in Plants?

Use the following information to answer questions 1 and 2.

Andre owns a tree farm where he grows trees and then sells them to people to plant in their yard. Andre can't sell his trees until they grow to 8 feet tall, which takes about six months. The faster the trees grow, the sooner he can sell them and make more money. Andre wanted to investigate how he could help his trees grow faster without spending money on extra fertilizer or water for the plants. He had the idea of growing a sample of trees in a greenhouse where he kept the temperature warm, about 85°F (29.4°C), and another sample in a greenhouse where he kept the temperature cooler, about 65°F (18.3°C). Andre watered all the plants the same and made sure both groups got the same amount of sunlight. After just four months the trees in the warm greenhouse had all reached 8 feet tall, but the trees in the cooler greenhouse only grew to 5 feet.

1. For a plant to grow, what must be valid about the rate of photosynthesis compared with the rate of cellular respiration? Explain your reasoning.

2. Use what you know about photosynthesis and temperature to explain why the trees in the warm greenhouse grew taller than the ones in the cool greenhouse.

3. A theory and a law serve the same purpose in science.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your investigation about temperature and photosynthesis.

4. In science, it is not possible to make an inference without first observing.

- a. I agree with this statement.
- b. I disagree with this statement.

Explain your answer, using an example from your investigation about temperature and photosynthesis.

5. Scientists try to identify the effect that certain factors can cause in a system. Explain why identifying cause-and-effect relationships is useful in science, using an example from your investigation about temperature and photosynthesis.

6. It is important for scientists to understand the relationship between energy and matter and how they move through a system. Explain why this is important, using an example from your investigation about temperature and photosynthesis.