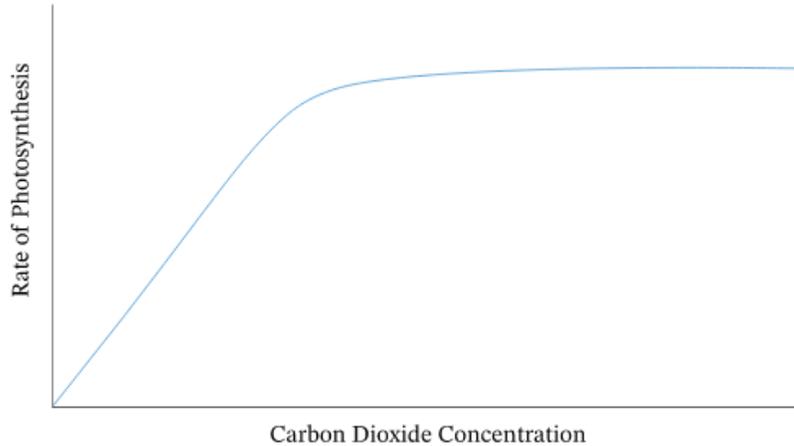


Worksheet - Factors affecting rate of photosynthesis

- 1. An increase in the amount of chlorophyll in the leaf will the rate of photosynthesis.**
 - a. Increase
 - b. Decrease
 - c. Have no effect on
- 2. A decrease in carbon dioxide availability will the rate of photosynthesis.**
 - a. Increase
 - b. Decrease
 - c. Have no effect on
- 3. Why will an increase in carbon dioxide concentration result in an increase in the rate of photosynthesis?**
 - a. Carbon dioxide provides the energy needed for photosynthesis.
 - b. Carbon dioxide is a reactant and a raw material needed for photosynthesis.
 - c. Carbon dioxide acts as a catalyst to speed up the rate of reaction.
 - d. Carbon dioxide is a product of photosynthesis
- 4. Fill in the blanks: Photosynthesis happens faster at a _____ temperature because the molecules that carry out the reaction have more _____ energy.**
 - a. Higher, light
 - b. Higher, kinetic
 - c. Lower, heat
 - d. Lower, kinetic
- 5. Which of the following is not a major limiting factor for the rate of photosynthesis?**
 - a. Carbon dioxide concentration
 - b. Temperature
 - c. Light intensity
 - d. Oxygen concentration
- 6. Why will a decrease in light intensity result in a decrease in the rate of photosynthesis?**
 - a. A decrease in light intensity means a decrease in the energy required for photosynthesis to take place.
 - b. A decrease in light intensity means the enzymes that control photosynthesis may denature.

- c. A decrease in light intensity means an increase in the energy required for photosynthesis to take place.
- d. A decrease in light intensity means a decrease in the available reactants needed for photosynthesis.

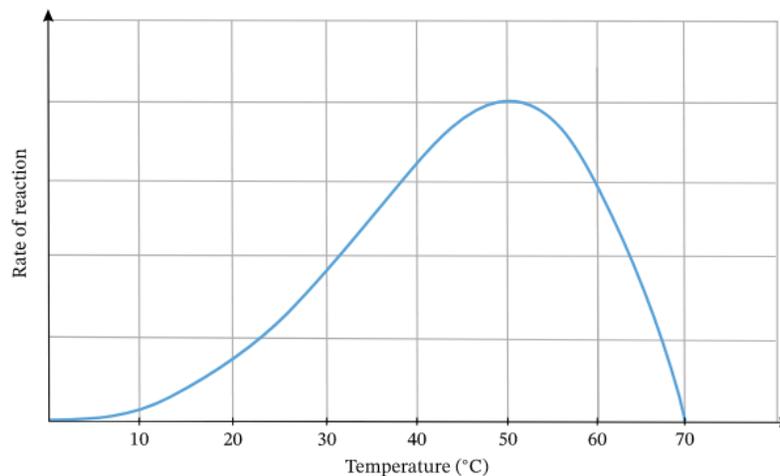
7. The graph provided shows the correlation between carbon dioxide concentration and the rate of photosynthesis. Which of the following best describes this correlation?



- a. As CO₂ concentration increases, the rate of photosynthesis increases continually.
- b. As CO₂ concentration increases, the rate of photosynthesis increases until it plateaus.
- c. As CO₂ of photosynthesis

8. The graph shows the temperature and the can we assume has

- a. The water used up, so



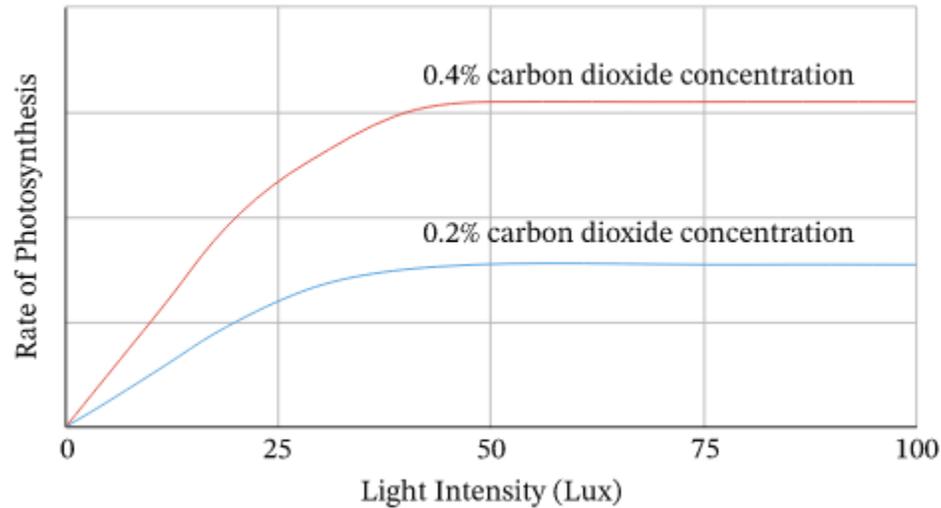
concentration increases, the rate decreases until it plateaus. relationship between rate of photosynthesis. What happened after 50°C?

supplying the plant has been photosynthesis cannot take

place.

- b. The enzymes needed for photosynthesis have denatured.
- c. Another factor, such as light intensity, is limiting the rate of reaction.

9. The graph provided shows the rate of photosynthesis as light intensity changes at two given CO₂ concentrations.



I. Which of the following statements is correct about the graph?

- A. At both concentrations of CO₂, the rate of photosynthesis increases as temperature increases continually.
- B. The rate of photosynthesis is consistently higher at 0.4% carbon dioxide concentration.
- C. The rate of photosynthesis is consistently higher at 0.2% carbon dioxide concentration.

II. What factor could be increased to allow the rate of photosynthesis to keep increasing past 50 lux?

- A. Oxygen concentration
- B. Light intensity
- C. Temperature

10. The two graphs below show the effects of light intensity and temperature on the rate of photosynthesis in land plants. These two factors affect many enzymes that control photosynthetic reactions. Study the graphs and answer the questions that follow. (Light intensity is measured in lumens, the SI unit of light flow.)

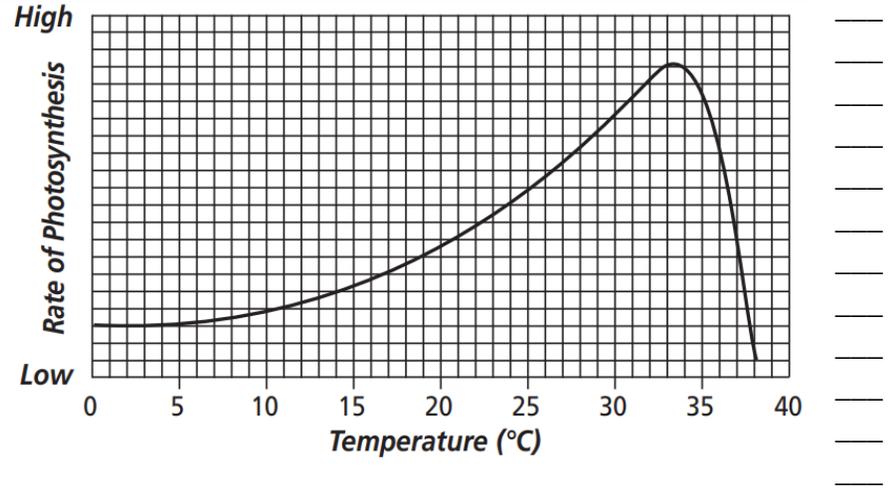
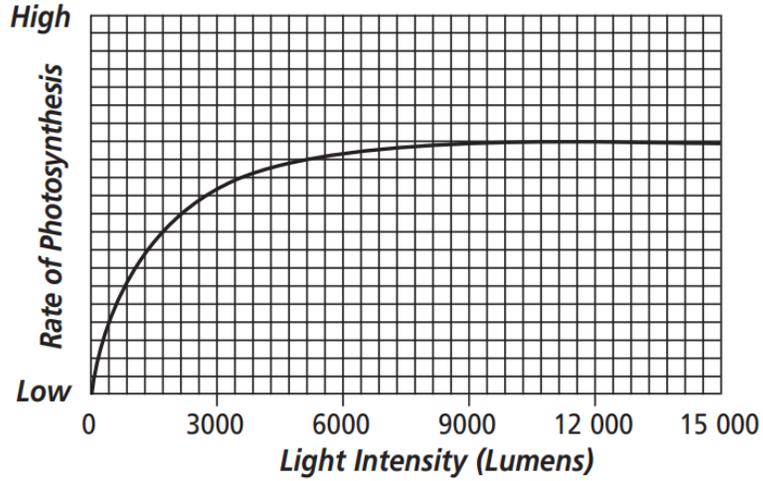
a. What does the graph on the left tell about the effect of light intensity on the rate of photosynthesis?

b. What happens when light intensity rises above 9000 lumens?

c. What adaptive advantages would a plant have if its photosynthetic rate kept increasing with light intensity above 9000 lumens?

d. What does the graph on the right tell about the effect of temperature on the rate of photosynthesis?

e. What happens when the temperature rises above 33°C?



f. What light intensity and temperature levels allow the highest photosynthesis rate?
