Analysis BIOLOGICAL PRINCIPLES I

Photosynthesis & Cellular Respiration

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1. Refer to your data from germinating peas. Does the oxygen concentration decreases as the carbon dioxide concentration increases? Is this what you would expect? Explain why or why not.

No, and no. I expected the oxygen to decrease while the carbon dioxide increased, simply because the oxygen would be exchanged with carbon dioxide from the respiration cycle.

2. Calculate the respiratory rates for germinating peas and the crickets. Include the results for your group, and the class average as well. List them below:

	Your Group	Class Average
Germ. Peas	1,097 ppm	1,269 ppm
Crickets	3,115 ppm	2,100.5 ppm

3. Which organism had the higher respiratory rate? Why?

Crickets. Because they need to increase the oxygen concentration to overcome the CO_2 concentration.

4. How would your personal respiratory rate compare to that of the cricket? Explain your reasoning.

My respiratory rate would be much higher than the crickets because my body requires more energy to operate than the crickets.

5. How does the respiratory rate of the geranium leaves (dark result) compare to the respiratory rate of the germinating peas? What does this indicate about their comparative rates of energy use?

The peas had a higher respiratory rate than the leaves. It indicates that the peas require more energy to function than the leaves.

6. Calculate net photosynthesis for your group, and list the class average as well.

Your group: -578 Class average: -797

Are the rates similar?

No.

7. In a green plant, why is it necessary to run the experiment in both the presence of light, and in darkness (wrapped in foil)?

It is necessary because it allows you to find the respiration rate and the photosynthetic rate.

8. The photosynthetic rate you measured in the light was net photosynthesis because respiration was occurring simultaneously (the rates reported in question 6 above). Calculate gross photosynthesis using the formula: GP = NP – R in which GP is gross photosynthesis; NP is net photosynthesis; R is respiration (dark result). Remember to use positive and negative signs as appropriate for the measured rates.

GP = -871

9. In a healthy plant which rate should be higher, gross photosynthesis or respiration? Explain your reasoning. Was the plant we used healthy?

Respiration should be higher. It means the plant is getting enough energy. Yes the plant we used was healthy.

10. What would have happened to the rate of photosynthesis if we had illuminated the geranium leaves with green light?

The rate of photosynthesis would have decreased.