

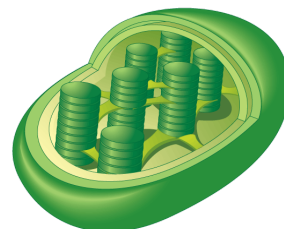
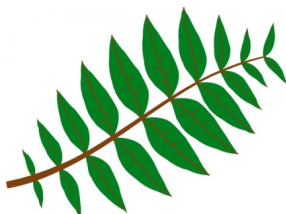
Name: _____ Period: _____ Date: _____

Biology - Chloroplast Reactions Activity

Chloroplasts are the organelles in which photosynthesis takes place. In order to fully understand the chemicals involved in photosynthesis, you have found plants with different numbers of chloroplasts in their leaf cells. You measure the oxygen and carbon dioxide concentrations after 10 minutes. On a separate sheet, please create two graphs using the data provided.

Graph 1 - Chloroplast # vs Oxygen Concentration

Chloroplasts (per leaf cell)	Oxygen Concentration (ppm)
0	50
20	100
40	200
60	300
80	400
100	500
200	1000



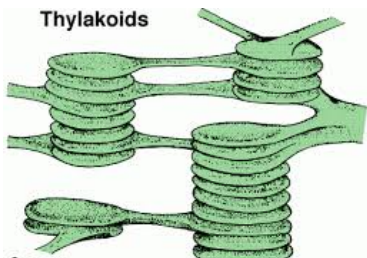
Graph 2 - Chloroplast # vs Carbon Dioxide Concentration

Chloroplasts (per leaf cell)	Carbon Dioxide Concentration (ppm)
0	1000
20	800
40	400
60	300
80	200
100	100
200	50

Analysis

Answer the following questions about chloroplasts using your graphs.

1. What is one nutrient that plants need to photosynthesize? Explain using evidence.
2. What is one waste product that plants produce during photosynthesis? Explain using evidence.
3. Based on your knowledge of photosynthesis, what else could we have measured to show us the rate of photosynthesis? Hint: Think about other nutrients and waste products for photosynthesis.
4. In a leaf, where would you expect to find cells with the most chloroplasts (middle of the leaf, top of the leaf or bottom of the leaf)? Explain using your knowledge of photosynthesis.
5. There are flat structures in chloroplasts called thylakoids, where the photosynthesis actually takes place. How do you think the shape of these structures allows the most photosynthesis to occur?



Going Further

You have decided to colonize the moon and build a house that is completely sealed off from the lunar environment. You know that the average human consumes about 50 liters of oxygen per hour. You also know that one average house plant produces about 0.15 liters of oxygen per hour.

- a. How many house plants would you need to sustain you and two family members? Please show your work?
- b. What color spaceship would you fly to the moon? (Mine would be painted like a tiger.)