



10) Why did the leaf discs float after a few minutes?

11) Do all plant cells have chloroplasts?

12) Explain your reasoning to the question above.

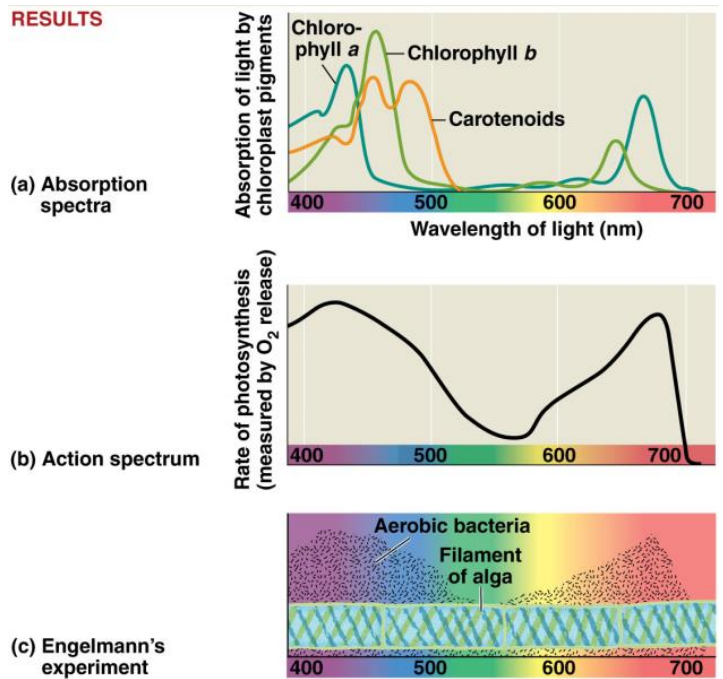
13) Do plant cells have mitochondria?

14) Explain why the estimated time for 50% of floating leaf disks was a measurement of net photosynthetic rate rather than photosynthetic rate

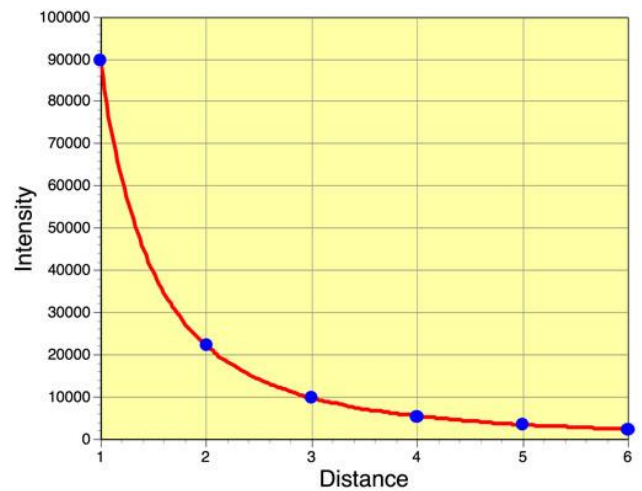
15) Describe the absorption spectrum of chloroplast pigments

16) Explain what the absorption spectrum means

17) Explain the behavior of the bacteria



18) Describe the relationship between distance from a light source and light intensity



Bipyridyliums are a class of chemical herbicide that take electrons from ferredoxin, the electron carrier that shuttles electrons from the primary electron acceptor of photosystem I to NADP<sup>+</sup> reductase

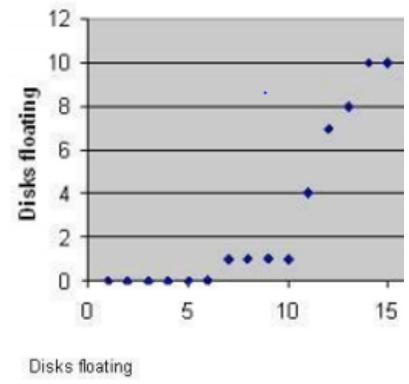
19) Predict, with reasoning, the short term effects of bipyridyliums on the following:

1. Photosystem I
2. Photosystem II
3. NADPH production
4. Oxygen production
5. ATP production
6. pH of the stroma
7. Glyceraldehyde-3-phosphate production
8. Carbon fixation

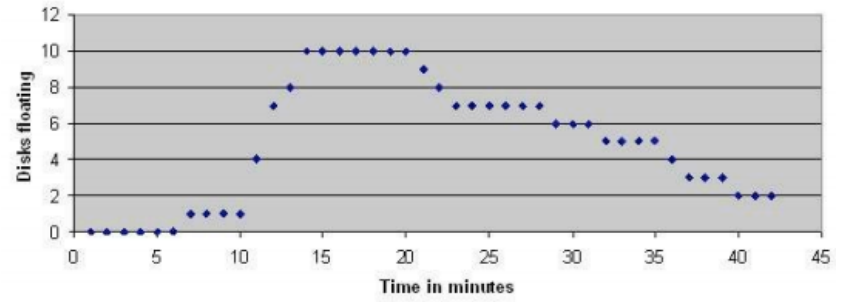
20) If the pH of the thylakoid space decreased, predict what would happen to ATP synthesis

21) Give a reason for your prediction

22) Determine the  $ET_{50}$

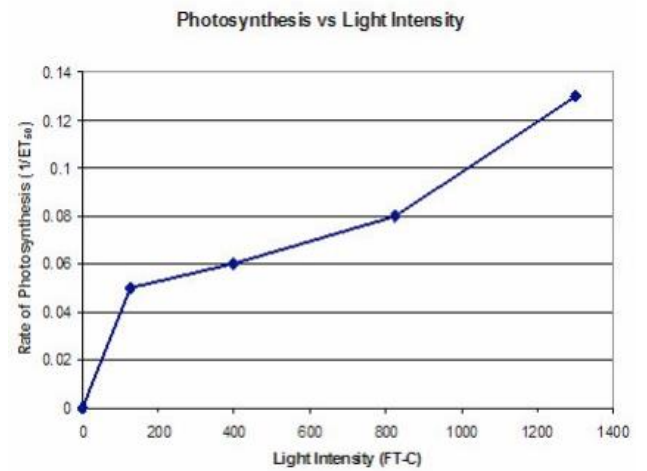


23) Describe the data below



24) Suggest an explanation for the data

25) Describe the change in net rate of photosynthesis from 0 to 1200 FT-C



## **Crosscutting concepts in science**

### **Cause and effect: Mechanism and Prediction**

How was the following demonstrated in this lab?

26) Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

27) Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

### **Energy and matter: Flows, Cycles, and Conservation**

How was the following demonstrated in this lab?

28) Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

29) Energy drives the cycling of matter within and between systems.

### **Structure and Function**

How was the following demonstrated in this lab?

30) The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.