Lab Report: Abstract

Is a single paragraph written in complete sentences

Summarizes

- Purpose
- Problem
- Methods
- Results
- Significance of results

Does not include:

- References
- Definitions
- Anything not in the report

The Abstract may be at the start…

…but it’s often the last thing that you write

It needs to be a clear and accurate guide to the rest of the text

Sample Abstract: Purpose

This study was undertaken to determine the wavelengths of light that are most effective in promoting photosynthesis in the aquatic plant *Elodea canadensis* since some wavelengths are generally more effective than others. Rate of photosynthesis was determined at 25oC, using wavelengths of 400, 450, 500, 550, 600, 650, and 700 nm and measuring the rate of oxygen production for 1-h periods at each wavelength. Oxygen production was estimated from the rate of bubble production by the submerged plant. We tested 4 plants at each wavelength. The rate of oxygen production at 450 nm (approximately 2.5 mL O_2/mg wet weight of plant/h) was nearly 1.5x greater than that at any other wavelength tested, suggesting that light of this wavelength (blue) is most readily absorbed by the chlorophyll pigments. In contrast, light of 550 nm (green) produced no detectable photosynthesis, suggesting that light of this wavelength is reflected rather than absorbed by the chlorophyll.

Sample Abstract: Problem

This study was undertaken to determine the wavelengths of light that are most effective in promoting photosynthesis in the aquatic plant *Elodea canadensis* **since some wavelengths are generally more effective than others**. Rate of photosynthesis was determined at 25oC, using wavelengths of 400, 450, 500, 550, 600, 650, and 700 nm and measuring the rate of oxygen production for 1-h periods at each wavelength. Oxygen production was estimated from the rate of bubble production by the submerged plant. We tested 4 plants at each wavelength. The rate of oxygen production at 450 nm (approximately 2.5 mL O_2/mg wet weight of plant/h) was nearly 1.5x greater than that at any other wavelength tested, suggesting that light of this wavelength (blue) is most readily absorbed by the chlorophyll pigments. In contrast, light of 550 nm (green) produced no detectable photosynthesis, suggesting that light of this wavelength is reflected rather than absorbed by the chlorophyll.

Sample Abstract: Method

This study was undertaken to determine the wavelengths of light that are most effective in promoting photosynthesis in the aquatic plant *Elodea canadensis* since some wavelengths are generally more effective than others. **Rate of photosynthesis was determined at 25oC, using wavelengths of 400, 450, 500, 550, 600, 650, and 700 nm and measuring the rate of oxygen production for 1-h periods at each wavelength. Oxygen production was estimated from the rate of bubble production by the submerged plant. We tested 4 plants at each wavelength**. The rate of oxygen production at 450 nm (approximately 2.5 mL O_2/mg wet weight of plant/h) was nearly 1.5x greater than that at any other wavelength tested, suggesting that light of this wavelength (blue) is most readily absorbed by the chlorophyll pigments. In contrast, light of 550 nm (green) produced no detectable photosynthesis, suggesting that light of this wavelength is reflected rather than absorbed by the chlorophyll.

Sample Abstract: Results

This study was undertaken to determine the wavelengths of light that are most effective in promoting photosynthesis in the aquatic plant *Elodea canadensis* since some wavelengths are generally more effective than others. Rate of photosynthesis was determined at 25oC, using wavelengths of 400, 450, 500, 550, 600, 650, and 700 nm and measuring the rate of oxygen production for 1-h periods at each wavelength. Oxygen production was estimated from the rate of bubble production by the submerged plant. We tested 4 plants at each wavelength. **The rate of oxygen production at 450 nm (approximately 2.5 mL O_2/mg wet weight of plant/h) was nearly 1.5x greater than that at any other wavelength tested, suggesting that light of this wavelength (blue) is most readily absorbed by the chlorophyll pigments. In contrast, light of 550 nm (green) produced no detectable photosynthesis**, suggesting that light of this wavelength is reflected rather than absorbed by the chlorophyll.

Sample Abstract: Significance of results

This study was undertaken to determine the wavelengths of light that are most effective in promoting photosynthesis in the aquatic plant *Elodea canadensis* since some wavelengths are generally more effective than others. Rate of photosynthesis was determined at 25oC, using wavelengths of 400, 450, 500, 550, 600, 650, and 700 nm and measuring the rate of oxygen production for 1-h periods at each wavelength. Oxygen production was estimated from the rate of bubble production by the submerged plant. We tested 4 plants at each wavelength. The rate of oxygen production at 450 nm (approximately 2.5 mL O_2/mg wet weight of plant/h) was nearly 1.5x greater than that at any other wavelength tested, suggesting that light of this wavelength (blue) is most readily absorbed by the chlorophyll pigments. In contrast, light of 550 nm (green) produced no detectable photosynthesis, **suggesting that light of this wavelength is reflected rather than absorbed by the chlorophyll.**

Answering short answer questions

- Typically, short answer questions will ask you **to do** one or more things; you will do those things in the context of your **topic**; and your answer will be **limited** in one or more ways

- So your first step should be to identify task, topic, and restriction words

How to identify instruction, topic, and restricting words

Imagine you have to answer the following question:

Describe phenotypic plasticity in hermaphroditic common pond snails, *Physa acuta*, in the absence of mates and briefly discuss the costs and benefits of phenotypic plasticity in this species.

(Answer in 4-5 sentences)

Step 1: Underline the instructions or clue words

Find the **words that tell you what you have to do**. Look for words like:

- Identify
- List
- Describe
- Explain

Describe phenotypic plasticity in hermaphroditic common pond snails, *Physa acuta*, in the absence of mates and briefly **discuss** the costs and benefits of phenotypic plasticity in this species.

(Answer in 4-5 sentences)

Step 2: Identify the topic words

Find the words that tell you what you have to write about:

Describe **phenotypic plasticity** in hermaphroditic common pond snails, *Physa acuta*, in the absence of mates and briefly discuss **the costs and benefits of phenotypic plasticity** in this species.

(Answer in 4-5 sentences)

Step 3: Identify the words that make the topic more specific

Describe phenotypic plasticity **in hermaphroditic common pond snails**, *Physa acuta*, **in the absence of mates** and briefly discuss the costs and benefits of phenotypic plasticity **in this species**.

(Answer in 4-5 sentences)

Take note

- Pay attention to words that give guides:
  - Briefly
  - Answer in 4-5 sentences

- Short answer responses don’t need to be pretty, they just need to get the job done!

- Markers are probably looking for specific responses, so data dumps won’t be useful and may even obscure the answer

How does this work as a response?

In the absence of mates, hermaphroditic snails delay reproduction by a couple of weeks (cost), then fertilize their own eggs with their sperm, which has the benefit of allowing these snails to reproduce and gain some fitness when mates are not available. One cost of self-fertilization is that these snails produce fewer offspring. Self-fertilization may also lead to inbreeding depression (cost). A multiple reproductive strategy, or phenotypic plasticity, allows this species to experiences higher fitness than it would with a single mode of reproduction.

Sample Short Answer Question

Use the example of the California sea otter to explain why ecologists must study multiple hierarchical approaches/levels (4) to understand environmental problems, such as the decline of sea otters in Alaska in the 1990s. (8 marks)

Sample Short Answer Response

The decline in sea otter numbers was due to killer whales. On the individual level (level 1), the preferred prey of killer whales are seals and sea lions. The population approach (2) shows that seal and sea lion numbers had decreased dramatically. At the community level (3), the decrease in seals and sea lions drove killer whales to hunt sea otters, causing otter numbers to decline. Using the ecosystem approach (4), we observe flow of energy: energy from the sun is used by kelp (photosynthesis), kelp is eaten by sea urchins, sea urchins are eaten by otters, otters are eaten by whales. Dead organisms are eaten by detritivores.