

SCIENTIFIC METHOD ANALYSIS

Complete the following and answer the questions/draw the graph in your BILL.

A marine biologist conducted a study of the ability of vertebrate blood to carry oxygen. He believed that a low environmental temperature would cause the organism's blood to contain a lower concentration of oxygen than at a higher temperature. The following reflects the scientist's experiment and the data he collected.

- Two tanks of salt water, each containing 25 gallons, were set up in the lab.
- Each tank was filled with the same types of organisms (perch and salmon).
- The same types of aerators were added to each tank to supply oxygen to the fish.
- To one of the tanks, marked TANK A, the temperature was decreased at increments of 5° C every 20 minutes.
- The second tank, marked TANK B, the temperature was raised at increments of 5° C every 20 minutes.
- Blood was removed from each of the fish and measured for its oxygen content.
- Below are the results from the above experiment.

Amount of Dissolved Oxygen in fish at Varying Temperatures

Temperature in Degrees Celsius	Amount of Dissolved Oxygen found in fish in TANK A (ml/g)	Temperature in Degrees Celsius	Amount of Dissolved Oxygen found in fish in TANK B (ml/g)
25	35	25	35
20	30	30	32
15	23	35	39
10	12	40	35
5	8	45	20

1. Develop a hypothesis (H_1) for the experiment based on the background information.
2. Write a NULL HYPOTHESIS (H_0) for this experiment.
3. What are the experimental controls in this experiment?
4. What is the independent variable in the above experiment?
5. What is the dependent variable in the above experiment?
6. Is the above experiment a controlled experiment? YES NO
EXPLAIN why or why not?

ANALYSIS OF DATA

7. Based on the data, is the H_1 hypothesis correct?
8. Why or why not?
9. Use the line slope equation to calculate the rate of change in dissolved oxygen vs the temperatures tested in the fish in TANK A? Show your work, answer, and units.
10. Provide an explanation for the data collected. ***YOU MIGHT HAVE TO DO A LITTLE RESEARCH.***
Cite your resources. What happens to the concentration of dissolved oxygen in water as temperature increases or decreases? What happens to the metabolic rate in ectothermic fish as the water temperature decreases or increases?

REMEMBER WHAT A SCIENTIFIC EXPLANATION LOOKS LIKE!

VISUALIZING THE DATA: Create a graph of the experimental data.

What type of graph would be most appropriate?

Remember to include all aspects of a "good" graph

