Ocean Zones Lab Report

Instructions: In the Ocean Zones Lab you explored organism adaptations that help them survive best in a particular habitat and observed how changing some of the factors in the ocean affect the organisms that live there. Record your observations in the lab report below. You will submit your completed report.

(30 points possible)

Name and Title: (1 point)

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Ocean Zones Lab

Objective(s): (2 points)

In your own words, what was the purpose of this lab?

The purpose of this lab was to examine surrounding effects on marine organisms in different zones of the ocean (effects such as light/temperature, geological, and chemical components).

Hypothesis: (5 points)

Write your hypothesis by completing the if/then statements below for each of the 5 trials.

- Trial 1: Anglerfish in high light levels vs. low light levels
  If the light in the habitat is increased, then the anglerfish will have a (higher/lower) health rating.

  If there is more light in the habitat, then the anglerfish will have a lower health rating.

- Trial 2: Anglerfish in high pressure levels vs. low pressure levels
  If the pressure in the habitat is increased, then the anglerfish will have a (higher/lower) health rating.

  If there is more pressure in the habitat, then the anglerfish will have a higher health rating.

- Trial 3: Anemone in high salinity levels vs. low salinity levels
  If the salinity in the habitat is increased, then the anemone will have a (higher/lower) health rating.

  If there is more salinity in the habitat, then the sea anemone will have a higher health rating.

- Trial 4: Anemone in high pH levels vs. low pH levels.
  If the pH in the habitat in increased, then the anemone will have a (higher/lower) health rating.

  If there is more pH in the habitat, then the sea anemone will have a lower health rating.

- Trial 5: Narwhal in high temperature vs. low temperature levels
  If the temperature in the habitat is increased, then the narwhal will have a (higher/lower) health rating.

  If the temperature is higher in the habitat, then the narwhals will have a lower health rating.

Procedure:

In this lab, you will meet three marine organisms who are searching for just the right habitat. Take a look at each one's profile, then make a prediction about what type of environment it would prefer. You will then conduct multiple trials.

For each one, you will write a hypothesis showing how an independent variable will affect the dependent variable (the health of the organism). You'll be able to test your hypothesis in controlled aquarium settings and collect some data and observations for your report. Each trial will show the health rating of the organism, which uses data about their activity and respiration to generate a number between 0 and 10, with 10 being the best health.

Data: (10 points)

Record the health meter reading in the table below for each of the trials, and then record your observations of the organism's behavior.

Trial	Hypothesis	Independent Variable	Health Reading	Behavior Observation
Trial 1: Anglerfish	More light = lower health rating	High light = 10 lux	3	Seems to not move around as much
		Low light = 2 lux	10	Moves around more
Trial 2: Anglerfish	More pressure = higher health rating	High pressure = 100 atm	10	Moves around pretty quickly
		Low pressure = 10 atm	0	Moves around really slow

Trial 3: Anemone	More salinity = higher health	Low salinity = 28 ppt	4	Looks like somebody stomped on it
		High salinity = 36 ppt	9	Looks vibrant and alive
Trial 4: Anemone	More pH = lower health rating	High pH = 8.3	9	Looks vibrant and alive
		Low pH = 6.7	2	Looks sort of dead, like it was stomped on
Trial 5: Narwhal	Higher temperature = lower health rating	High temperature = 18°C	6	Moves around very slowly
		Low temperature = 4°C	10	Moves around very fast, and looks happy

Conclusion: (12 points)

Your conclusion will include a summary of the lab results and an interpretation of the results. Please write in complete sentences.

1. How did your hypotheses compare to the results for each trial?

   All of my hypotheses were correct, except for trial 4 (the one dealing with pH levels and sea anemone).

2. Which independent variable affected the organism's health positively in each of the trials? Why do you think this occurred?

   Trial 1 – A lower amount of light, because their habitat is basically complete darkness. They have a little light on them, but they are not suitable to large amounts of light (like that is found at the surface).

   Trial 2 – A higher amount of pressure, because their bodies are designed to survive in higher amounts of pressure (as they are a deep-water species), so they wouldn't be adaptable to areas with lower pressure.

Trial 3 – A higher amount of salinity, because higher salinity reduces bleaching during heat stress (frontiersin.org). This affects what was seen in the trials.

Trial 4 – A higher pH level, because they need higher levels of dissolved oxygen (ratemyfishtank.com).

Trial 5 – A lower temperature, because their habitat is very cold (arctic temperatures). They are able to maintain a constant warm body temperature in these conditions. But their bodies are not suitable for warmer temperatures (coolantarctica.com).

3. What types of behaviors were exhibited with high health ratings in each trial? What types of behaviors were exhibited with low health ratings for each trial?

   When it came to higher health ratings, the species were more alive and looked much more active. When it came to lower health ratings, they were a lot slower and things like the sea anemones looked like someone stepped on them.

4. Based on the results in the experiment, what can you infer are the habitat characteristics necessary to provide the highest health rating? Explain why.

   Based on the results in the experiment, I can infer that:

   - Anglerfish do better in places with very low amounts of light and higher pressure.
   - Sea anemone do better in places with higher pH and salinity.
   - Narwhals do better in habitats that are colder, in such places as Antarctica.