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Coquina Observation Lab Objectives:

TSW:

1. Make meaningful scientific observations
2. Design a lab using supplies and desired outcomes
3. Analyze and differentiate qualitative and quantitative observations.
4. Analyze and differentiate observations and inferences.
5. Have fun and get to know your new Pre-IB Biology classmates!

Introduction:

Observations are very important in the field of science. To properly analyze problems, as well as draw proper conclusions, one must take good, accurate observations. Observations rely on data taken in through the senses and may be divided into two main types.

Qualitative observations are general observations. This type of observation looks at the general quality of what is being observed. Quantitative observations are more exact observations, which generally involve numbers or measurements. This type of observation involves some type of quantity dealing with what is being observed. When taking observations, the most exact, precise language or wording should be used.

Inferences are feelings or conclusions reached based on the observations taken. Inferences are not directly observed using the senses and cannot be directly measured, rather they are opinions of what the observations mean.

Although it doesn’t seem likely at first, people often confuse observations and inferences. This causes particular problems in the field of science, as scientists are to remain neutral or be very objective when performing an experiment. Both observations and inferences have their place in scientific experiments or studies. Observations are the initial data used to draw conclusions or inferences later. One should not make inferences during the collection of data or the data may be incorrect.

Where to start:

Using:

Coquina clams

Sand and ocean water

Petri dishes

Pipettes

Food dye

You will be testing:

1. how stimulation affects coquina clams (note: many forms of stimulation exist; moreover, you are not limited in the type(s) of stimulation you choose)
2. How liquids are circulated through the coquina clams (incurrent and excurrent)
3. Diagram the coquina based on your experiment (later you will compare to an a scientific diagram)

Directions:

1. Design your procedure as a group
   1. Hint: YOU NEED A CONTROL
2. Assign roles to lab partners
3. Obtain your organism from the lab table. **The organisms are not to be harmed in any manner during the lab**. We will return the organisms to the ocean this afternoon.

Observation Parameters:

1. You need at least 10 qualitative and at least 10 quantitative observations recorded in a data table for the control experiment.

2. You need a minimum of 3 qualitative observations and a minimum of 5 quantitative observations for stimulation compiled in a data table (see data table example below- you may use this one or come up with your own. Note: this data table **does not** include the 8 observations.)

Table

|  |  |
| --- | --- |
| Area Touched | Type of Response |
|  |  |
|  |  |
|  |  |

Key

0 = no response

+=slight response

++= moderate response

+++ = great response

3. You need a minimum of 5 qualitative observations and 5 quantitative observations for circulation of substances as well as a color-coded, labeled diagram of the organism including incurrents and excurrents.

Questions:

1. Analyze the functions of the coquina clam’s siphons and foot.
2. Compare and contrast your coquina diagram to a scientific diagram.
3. Research which level of the ocean the coquina clams reside in and provide evidence as to why this ocean level is ideal for the clam.
4. Research and draw a coquina food web.
   1. Analyze the importance of phytoplankton to marine life.
5. Predict what would happen to the coquina clam if ocean water levels decrease. Justify your answer.
6. Predict what would happen to a coquina clam if he were displaced to an environment that had plenty of salt water but mud instead of sand. Justify your answer.
7. Analyze how beach vacationers affect the coquina clam populations.
   1. Design a mini lab to test the affects in a classroom lab setting.
8. If you were a coquina clam, what color would you want your shell to be? Justify your answer.

Rubric:

|  |  |  |
| --- | --- | --- |
| Topic | Pts Available | Pts Earned |
| Goals | 2 |  |
| Supplies | 2 |  |
| Set Up | 2 |  |
| Data table/ graph | 5 |  |
| Data Analysis | 5 |  |
| Final Thoughts | 5 |  |
| Probing ? | 10 |  |
| Total | 31 |  |