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**Ocean Acidification Inquiry Lab**

Write the following sections in your Laboratory Notebook

**Purpose** - Students will design an experiment to determine the effect of pH on the solubility of CaCO3 in H2O

**Background Knowledge** - Read the article entitled *The Dangers of Ocean Acidification* (Scientific American, 2006) and answer the following questions in complete sentences.

1. Which ocean organisms rely on the insolubility of CaCO3 to survive?
2. What is the normal pH of ocean water?
3. Which acid is forming in the ocean and affecting the pH of ocean water? What is the source of this acid?
4. Based on your response to the previous question, write a balanced equation to represent the chemical reaction taking place in our oceans.
5. How are humans impacting the acidification of our oceans?
6. Your task is to design an experiment that will test the solubility of CaCO3 in solutions with varying pH values. What will be the independent and dependent variables in your experiment?

**Materials**

* Vinegar
* Distilled H2O
* pH meter
* disposable pipettes
* sea shells
* balance
* safety goggles
* large 6-well plate
* 25 mL graduated cylinder
* weigh boats
* paper towels

**Procedure**

Safety – Write a bulleted list of safety precautions one must follow while performing this lab experiment

Protocol – Write a detailed protocol with numbered, imperative instructions that will allow one to quantitatively study the effect of pH on solubility of CaCO3. You must include a control group and at least 3 experimental groups in your experimental design.

**Observations** – Using complete sentences, write a bulleted list of any qualitative observations that you made during the laboratory activity.

**Data** – Create a table that organizes the quantitative data you collected during the lab activity. Graph your data on graph paper or using a computer program and paste the graph in your lab notebook.

**Data Processing** – Show work and clearly label any calculations you made for this lab. Include the formula in words, a substitution and a boxed answer with units.

**Conclusion/Analysis** – Write 2 paragraphs that include the following:

Paragraph 1:

* Write a topic sentence that refers to the purpose of this lab
* What experimental data was necessary in order to determine the affect of pH on solubility of CaCO3?
* Which variables were held constant in order to produce a well-designed experiment?
* How does pH affect the solubility of CaCO3 in water?
* How does your data apply to the marine ecosystem?

Paragraph 2:

* Discuss the likely sources of error for this lab
* How would the errors affect the results? (Be specific – would you see an increase or decrease in the measured values?)
* How could the results be improved?
* What further experiments would you like to conduct to further your understanding of this scientific phenomenon?