Marine Science: Virtual Urchin Lab (Ocean Acidification)
http://virtualurchin.stanford.edu/AcidOcean/AcidOcean.htm

Name: _____

Essential Question: *The ocean covers 2/3 of the planet- Is it really possible that humans are changing the chemistry of the ocean?*

1: **Carbon in the Air:** *What does the graph of atmospheric Carbon Dioxide tell us?*

2: **pH Scale:** *Where do some common items fall on the pH scale?* **Take a screen shot of your final answers and paste below:**

3: **Ocean pH:** *How might it change?* **A change from 8.2 to 8.1 on the pH scale is a _____ % increase in acidity.**

4: **Carbon in the Water:** *Explain what happens to Carbon in ocean water.*

5: **Exploring Carbon Levels and Effects:** ***Look over the interactive and describe*** what happens at each of the levels:

Scenario 1: Optimistic

Scenario 2: Middle Ground

Scenario 3: Pessimistic

6: **Diversity of Life in the Sea:** Sort each of the organisms into Calcifiers or Non-Calcifiers. **Take a screenshot of your final answer and paste below:**

7: **Echinoderms Life Cycles and Skeletons:** *Describe the life cycle of Echinoderms and explain why they are so sensitive to changes in pH.*

8: **How to Study Ocean Acidification in the Lab-** *How may ocean acidification impact Sea Urchins in the larval stage? Can you think of any other possible acidification impacts on marine organisms other than calcification?*

Welcome to the Ocean Acidification Lab!

1: *Complete the pre-lab certification.*

2: Look at the first slide under the microscope- **Describe what you see.**

3: Fill two flasks with sea water and label them with "pH 7.7" and "pH 8.1". ***Explain why we are using these two pH values for this experiment.***

4: ***What happens to the pH of the first sample when Carbon Dioxide is added? Explain.***

5: Complete the rest of the procedures to prepare slides for study

After Preparing All Slides Correctly:
GO to: **Urchin Larval Measurement Exercise**

pH 7.7	µm:
replicate A	
replicate B	
replicate C	

pH 8.1	µm:
replicate A	
replicate B	
replicate C	

6: After making measurements- **Find the AVERAGE of each data set**

<u>Take a screen shot</u> of the data data/graphs and paste below:

Discuss what your data showed: So What?

Conclusion: ***What would these changes do to the adult Sea Urchin population?***

How would that effect other organisms that depend on these organisms as a source of food? (Sea Otters)?

What did you learn about Ocean Acidification? Discuss.