

Name: _____

Date: _____

Shell Shocked

Reefs create a vital home for sea life, but roughly 75 percent of these underwater formations are believed to be at risk of disappearing. One of their biggest threats is ocean acidification.

When fossil fuels—coal, oil, and natural gas—are burned, carbon dioxide (CO₂) is released into the air. This gas dissolves in seawater. Chemical reactions break down CO₂ molecules and form new substances that cause the water to become more acidic. In many places, acidic ocean water is eating away the calcium carbonate (CaCO₃) that makes up coral skeletons—the foundations of reefs. In this activity, you'll design an experiment to learn how acidic liquids affect materials made of calcium carbonate.

PREDICT: Like the skeletons of corals, eggshells are made of calcium carbonate. How will an eggshell react to three liquids of varying acidity: water, white vinegar, and orange juice. Write a hypothesis, or a possible explanation, to this research question.

MATERIALS: safety goggles • 3 mason jars with lids • masking tape • marker
• 3 hardboiled eggs • white vinegar • orange juice • water • pH test strips
• magnifying lens • pencils • paper • paper towels

PLAN AN EXPERIMENT: How can you design an investigation that will test how liquids of different acidities affect calcium carbonate? Consider the materials that are available to you (listed above). Write a procedure that describes the steps of your experiment on a separate piece of paper.

Questions to think about when writing your procedure:

- What is your independent variable, or the factor you will change in the experiment?
- What is your dependent variable, or the factor you will measure and test?
- Describe the factors you will keep the same.

CONDUCT YOUR EXPERIMENT: Gather the necessary materials and carry out your experiment. Create a data table to record your results.

→ DRAW CONCLUSIONS:

1. Summarize the results of your experiment. Do your results support your hypothesis?
2. Based on your results, what is the strongest acid of the liquids you tested?
3. What will happen to coral reefs if the acidity of the oceans continues to rise? Use evidence from the experiment to support your answer.