

Hands on Chemistry Activity 3

Topic: Environmental Chemistry

Learning Objective: Students will observe the effects different substances have on sea creatures that depend on calcification to live underwater.

Alignment with NGSS Grades 3-5

Science and Engineering Practices

- Developing and Using Models
- Develop and/or use models to describe and/or predict phenomenon.

Construct Explanations and Design Solutions

- Construct an explanation of observed relationships.

Materials:

- Egg shells
- Pipettes
- Lemon juice
- Vinegar
- Cola
- Soap
- Ammonia
- pH strips

Detailed Description

- Activity
 - Students will receive egg shell pieces that will be used as substitutes for calcified shells used by sea creatures.
 - Students will test the pH of each of the solutions provided to record which substances are acids and which are bases.
 - Using pipettes, students will add a couple of drops of the solutions onto different egg shell pieces and observe what happens.
 - The reactions will be given some time to come to completion.
 - After a while, students will compare how the shells reacted differently to the various solutions that came in contact with them.
- The experiment shows that any acidic substance that the egg shell came in contact with caused it to degrade. This phenomenon is occurring in the ocean, where the uptake of excess CO₂ from the atmosphere is causing the pH of the ocean to increase. Even a

slight increase of pH can cause the degradation of the shells of animals in the ocean. This weakening of the shells makes the animals easier to prey upon which can cause their numbers to decrease.

- Conclusion
 - This experiment demonstrates how emissions from vehicles can have an effect besides global warming and sheds light on how much of a problem pollution can be.

What science process skills will this lesson exercise?

Students will perform an experiment on ocean acidification. Students will observe the results of the experiment and draw conclusions from what was observed.

Safety precautions

None