



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

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Project Title The Effects of Ocean Acidification on the Decalcification of Calcium Carbonate Shells	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of the project was to determine the effects of ocean acidification, caused by an increase in carbon dioxide, on the decalcification of calcium carbonate snail shells. We believe that if the amount of carbon dioxide is increased to an unnatural amount, the snails' shells will begin to decalcify.</p> <p>Methods/Materials 10 Margarita Snails were obtained and placed into two separate and controlled fish tanks, 5 in each tank. The snails were given a couple of days to familiarize themselves with their surroundings. Then, using a carbon dioxide injector made from a two liter bottle filled with warm water, sugar, and baker's yeast, carbon dioxide was placed into one of the two fish tanks at an excessive amount. From there, the snails' environment -pH and salinity- and progress in both tanks were documented over the course of one week. After the one week time frame, the snails were removed from both environments and weighed. The average masses of snails from the two separate tanks were recorded. The snails were euthanized and removed from their shells to be able to measure the volume of the shells. Finally, both the separate and average volumes of the snails were recorded and considered for our concluding results.</p> <p>Results Our results revealed that densities of the snails' shells in the tank that had carbon dioxide added to it were less than those in the tank that remained constant. The average density of the shells in the carbon dioxide tank was 1.76g/mL while the average of the shells in the constant tank was 2.32g/mL. Also, the pH in the carbon dioxide dropped to a low 7.33pH while the pH in the constant tank remained close to 8.0pH (some minor fluctuations did occur).</p> <p>Conclusions/Discussion In conclusion, if the amount of carbon dioxide in salt water is increased, then the snails' shells will begin to decalcify. This is evident through our results. In the carbon dioxide tank, the average density of all the shells was 1.76g/mL while in the constant tank the average density was 2.32g/mL. This is a 0.56 difference in the average density which shows that the tank with carbon dioxide added, did have an effect on the calcium carbonate in the shells.</p>	
Summary Statement This project documents the effects of carbon dioxide on the decalcification of Margarita Snail Shells over the course of one week.	
Help Received Mr. Bowns provided our project with certain pieces of equipment, including a graduated cylinder, scale, etc. Also, we emailed many college professors asking for any information pertaining to this project.	