



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Olivia R. Cooper</b>	<b>Project Number</b>  33427
<b>Project Title</b> <b>Ocean Acidification: Its Effects on Mussel Shells</b>	
<b>Objectives/Goals</b> My objective was to determine whether or not mussels shells are affected by relative acidification of their environment in order to collect more information about effects of ocean acidification. <b>Abstract</b> <b>Methods/Materials</b> I simulated ocean acidification in 9 jars by making 'sea water' using Instant Ocean salt and filtered water, I then tested the pH and added salt or water until it was between 8.05 and 8.14. In 3 jars labeled "Control", I filled the jars with the sea water, acting as normal sea water. In 3 jars labeled "Acidic 1", I added vinegar until the pH was between 7.75 and 7.84, acting as projected sea water after ocean acidification in the year 2100. In 3 jars labeled "Acidic 2", I added vinegar until the pH was between 7.45 and 7.54, acting as a the most acidified sea water. In each jar, I added exactly 1 oz of cleaned, dried, crushed mussel shells from the Puget Sound, a salt water source. I secured each lid and placed the jars in an undisturbed area for one month, observing them regularly. After a month, I drained the jars, collected and dried the shells. Then, I weighed and observed the shells. <b>Results</b> On average, the shells in the "Control" jars had no weight change, the shells in the "Acidic 1" jars had a -0.01 oz weight change, and the shells in the "Acidic 2" jars had a -0.01 oz weight change. I observed more fading and disintegration of the shells over time in the "Acidic 1" and "Acidic 2" jars compared to the "Control" jars. <b>Conclusions/Discussion</b> The shells did change visually and in weight, however subtle to demonstrate with the measurement tools I had. Over time, the shells in the acidified jars lost their vibrance, thinned, and were somewhat transparent. The shells in the "Control" jars showed little to no change. I believe this suggests the idea of ocean acidification to be a real issue in our oceans, however, I think further research and experimentation would show more powerful results.	
<b>Summary Statement</b> I am studying the effects of ocean acidification on mussels by exposing mussels shells to seawater with various levels of acidity.	
<b>Help Received</b> Mother helped me critically think through the various aspects of my experiment; Teacher helped me revise report; Mother helped me purchase materials; Mother helped me clean mussel shells	