



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Brittany N. Singleton	Project Number 22542
Project Title Will a Five-Gallon Saltwater Aquarium Complete a Nitrogen Cycle, ("Pop")?	
Abstract Objectives/Goals The objective is to prove that a 5-gallon saltwater aquarium setup in proportion to a larger tank will "Pop", complete a nitrogen cycle and create a natural filtration system, even though experts say it is too small and will not. Nitrosomonas and nitrobacter bacteria will grow and eat ammonia and nitrites and produce nitrates to give growth to algae and sustain marine life. Methods/Materials A 5-gallon aquarium is set-up in proportion to a larger tank with a Damsel fish to secrete ammonia to begin the cycle. A Saltwater test kit is used to test the ammonia, nitrite, and nitrate levels twice weekly for the 4-6 weeks it takes to achieve a "Pop". All results are recorded in ppms.(parts per million) as the ammonia and nitrite levels rise to a peak and fall and nitrates become established. 1/4 Water changes are made when necessary. Results A 5-gallon aquarium proved hard to maintain, however it did complete a nitrogen cycle in about the same amount of time as a larger tank, 4-6 weeks. The peak levels of 4.0ppm,for ammonia, and 4.0ppm, for nitrite were lower than the results of a normal larger tank, 0.6ppm and 10ppm. Changes in temperature and salinity occurred quickly in a small environment and needed constant attention. First tank fouled due to too many changes. Set-up and started a new one with a new fish. "Popped" faster the second time, bacteria still in the gravel. Conclusions/Discussion Although hard to maintain, a 5-gallon aquarium will "Pop". After the aquarium is set-up nothing should be changed, fish and bacteria are easily shocked by changes in a small environment. Water changes need to be made often.	
Summary Statement This project is to test the statement made by Marine experts that a 5-gallon aquarium will never "Pop" or complete a nitrogen cycle and sustain marine life.	
Help Received Grandpa provided introduction to SeaWorld marine expert, Grandma provided transportation to fish stores for materials and advise, Miss Wallen, my Science teacher, helped with project organization.	