



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

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Project Title Cleaner Waterways: Reducing the Effects of Fertilizer Runoff	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Blue green algae blooms are the cause of environmental, economic, and health problems world wide. In small quantities blue green algae is not a problem, but when it grows rapidly, called a bloom, it becomes a problem. Blue green algae blooms are caused by too much phosphate and nitrate from runoff of fertilizer from farms. This experiment's purpose is to try to reduce the amount of phosphate and nitrate in water in order to reduce the amount of blooms.</p> <p>Methods/Materials Using two different types of media (one targeting removal of phosphate and the other at the removal of nitrate) and two different methods of filtering (media bag and flow filter) the phosphate or nitrate contaminated solution were exposed to the media and the results were tested at various times/runs with a chemical indicator. If the phosphate or nitrate was removed by the media the indicator color would change when compared to the control solution.</p> <p>Results After 36 hours the phosphate media bag reduced the concentration of phosphate in the water by an average of 90% after all trials, which is a substantial change. The nitrate media bag also had remarkable results at the end of the test. After 34 hours the media bag reduced the concentration of nitrate in the water by an average of 98% after all trials. The phosphate flow filter was also successful. After 1 run phosphate concentration went from 10ppm to an average of 6.5ppm and after 10 runs phosphate went to 1ppm. The nitrate flow filter was very successful. The nitrate flow filter reduced the nitrate from 125ppm to 4ppm on average, a 97% change.</p> <p>Conclusions/Discussion After finishing all of the tests, I found that there is a way to reduce the quantity of phosphate and nitrate in water by using media bags and/or filters. Both forms of filters greatly reduced the amount of phosphate and nitrate in water. The media bag for phosphate after 36 hours tested at 1ppm and after 10 runs the phosphate flow filter tested as 1ppm. Also after 36 hours the nitrate media bag tested at 5ppm and after 1 run the nitrate flow filter tested at 2.5ppm. Due to these phenomenal results, blue green algae levels could be significantly decreased by using these filters to reduce the concentration of nitrate and phosphate from water. These filters can help the environment, the economy, and save lives.</p>	
Summary Statement Is there a filter system that would be able to significantly reduce the nitrate or phosphate (two main components of fertilizer that cause blue green algae blooms) concentrations from a solution?	
Help Received Father supervised experiment and explained proper lab technique.	