



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> Bryce S. Farrell	<b>Project Number</b>  31808
<b>Project Title</b> How Permanent Are Permanent Markers?	
<p align="center"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective is to determine if permanent markers are truly permanent. Does it depend on the material that is marked? Does the type of cleaning solution used effect the ability to remove the mark?</p> <p><b>Methods/Materials</b> Five marks were made with a Sharpie permanent marker pen on glass, oil based painted wood, latex painted drywall, galvanized steel, hard plastic, natural stone, and ceramic tile. The material was allowed to set up for two weeks, afterwhich an attempt was made to remove each mark by using 1/2 to 1 teaspoon of the following cleaning solutions: soap and water, nail polish remover, bleach, Graffiti Remover, and Goof-Off. Once the solution was applied, a non-scratch scouring pad was used to rub the mark up to 10 times. Rubbing stopped once the stain was no longer visible.</p> <p><b>Results</b> The most effective cleaning solution was the Graffiti Remover. It removed the mark off most of the surfaces. Both soap and water and bleach were the least effective on all surfaces. They only fully removed the mark from the glass. The surface that was the most difficult to clean was the natural stone surface. None of the cleaning solutions were able to lift the stain from the natural stone. The easiest surface to clean was the glass. The marks were removed quickly and easily from the glass.</p> <p><b>Conclusions/Discussion</b> The solutions containing alcohol performed the best. Most of the marks were either deeply faded or completely removed using solutions with alcohol. These solutions may have removed the stain, but they also removed the paint along with it. Natural stone, being the most porous, was unable to clean completely no matter which solution was used. The stain was able to settle into the porous material.</p>	
<b>Summary Statement</b> How permanent are permanent markers?	
<b>Help Received</b> Father supplied the materials; Mother help with the presentation	