



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Haylee C. Murrow</b>	<b>Project Number</b> <b>J0525</b>
<b>Project Title</b> <b>To Rust or Not To Rust</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My experiment is to determine which type of metal is most rust-resistant after being exposed to different liquids. I think the aluminum will be the most rust-resistant because it appears strong and smooth as if it has a coating on it that will protect it from rust.</p> <p><b>Methods/Materials</b> For my experiment I used a measuring cup, spoon, 24 test tubes, test tube tray, tap water, salt, vinegar, club soda, markers, tape, 6 pencils, four 8 inch pieces of steel, iron, copper, silver, zinc, and aluminum, camera, photo paper, journal, and a pen. First, I mixed one tablespoon of salt with one cup of tap water. Then I arranged four rows of six test tubes each, in the test tube tray and labeled it. I poured three tablespoons of water into each test tube of row one, three tablespoons of salt water into each test tube in row two, three tablespoons of vinegar into each test tube in row three, and three tablespoons of club soda into each test tube in row four. Next, I wrapped four pieces each of steel, iron, copper, silver, zinc, and aluminum around their own individual pencils, and labeled them with tape and markers. Every two days for ten days, I examined the metals and the liquids they were in. I took pictures and recorded the changes.</p> <p><b>Results</b> The iron was the only metal to form rust, which is known as "iron oxide". The iron formed the most rust in the club soda. The silver was affected the most by vinegar. The steel formed salt crystals at the top of the wire and on the pencil in salt water. All the liquids with steel in them evaporated. The steel itself showed the least amount of change of all the metals. The copper formed a green oxide which helped to protect it from further corrosion. The zinc had different amounts of corrosion in all liquids. The piece in vinegar broke in half. The aluminum had very little change in water and salt water.</p> <p><b>Conclusions/Discussion</b> My conclusion is that five out of six metals were rust-resistant, but did form other types of corrosion. Iron was the only metal to form "Rust". The type of liquid the metal is in does control the rate of corrosion. Steel was the least affected by all four liquids.</p>	
<b>Summary Statement</b> To determine which tupe of metal is most rust resistant when exposed to various liquids.	
<b>Help Received</b> My Dad helped me find different types of metal, my sister helped me format the graphs, my Mom drove me everywhere for supplies and checked my report	