



# CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

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| <b>Name(s)</b><br>Chase C. May   | <b>Project Number</b><br><b>J1121</b> |
| <b>Project Title</b><br><b>How Can Different Polymers Be Identified?</b>   |                                       |
| <b>Objectives/Goals</b><br>How can different types of polymers be identified without looking at the Plastic Identification Code?<br>The purpose of this science experiment is to identify different polymers (plastics) based on physical and chemical properties so that they can be sorted for recycling before being sent to a recycling center to make recycling easier.   |                                       |
| <b>Abstract</b><br><b>Methods/Materials</b><br>In this experiment I will identify the different physical and chemical characteristics of each type of plastic sample: - Color; - Clarity; - If the plastic is Soft and Pliable or Hard and Rigid; - Flame color when the plastic is burned; - Smoke color when the plastic is burned.<br>I will also determine the density of the plastic samples by comparing them to known densities of liquid solutions. If the sample floats in a liquid solution, the sample is less dense than the liquid solution. If the sample sinks in a liquid solution, the sample is more dense than the liquid solution.   |                                       |
| <b>Results</b><br>Plastic type characteristics observations:<br>Each plastic sample has unique physical characteristics, such as color, texture, and clarity.<br>Each plastic sample has unique chemical characteristics when burned, except for sample 2 & 5, which has the same flame color and smoke color.<br>Density Test Results:<br>Plastic type 1 & 4 had the exact same density test results<br>Plastic type 2 had unique density test results<br>Plastic type 3 had unique density test results<br>Plastic type 5 & 6 had the exact same test results  |                                       |
| <b>Conclusions/Discussion</b><br>Plastic types 2 & 3 can be uniquely identified by using just the density test. None of the other 4 plastic types acts the same as plastic type 2 and 3 which<br>Plastic types 1 & 4 can be identified by using the density test results and their unique physical characteristics. I compared the plastic color and flame color of each sample. Plastic type 1 is white, and plastic type 4 is green. Plastic type 11 had an orange flame and sample 4 had a very dark orange flame.<br>Plastic types 5 & 6 can be identified by using the density test and comparing the plastic color of each.<br>Plastic type 5 is off-white and plastic type 6 is black. Also, plastic type 5 had an orange flame and plastic type 6 had a red and dark orange flame. |                                       |
| <b>Summary Statement</b><br>The purpose of this science experiment is to identify different polymers (plastics) based on physical and chemical properties so that they can be sorted for recycling before being sent to a recycling center to make recycling easier.   |                                       |
| <b>Help Received</b><br>My mother helped me conduct the experiment.. My father helped me type the report and the display boards.   |                                       |