



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> Rebecca M. Sine	<b>Project Number</b> <b>J0618</b>
<b>Project Title</b> <b>Crazy Crystals: In Which Temperature Condition Do Crystals Grow Largest and Clearest?</b>	
<b>Objectives/Goals</b> In my science fair project, I tested which temperature condition crystals grow the biggest and clearest in. The temperature conditions I used were an ice bath (4° C), a refrigerator (10° C), and room temperature (22.22° C). My hypothesis was that the crystals that grew at room temperature would grow the largest and clearest, based on my research.	
<b>Abstract</b> <b>Methods/Materials</b> The crystals are formed by recrystallization and are made from a supersaturated solution of borax powder and water (with a ratio of 60 grams of borax for every 235 ml. of water in each cup the crystals were grown in). So I made the borax solution by boiling the water so that more borax would dissolve in it than at a cooler temperature. Then equal amounts of solution was poured into the cups, and then placed in the three different temperature conditions.	
<b>Results</b> The solutions cooled in the ice water grew many small, opaque crystals; the ones cooled in the fridge grew bigger in size, clearer in transparency, and formed a more recognizable cube shape. Finally, the solutions cooled at room temperature grew the best of all, with a large, clear, and hard structure.	
<b>Conclusions/Discussion</b> This shows that crystals grown from a solution need to be cooled slowly, not quickly, in order to grow large and clearly. My hypothesis was right. A real-life application of my project could be to show people how to make large and sweet sugar crystals (rock candy) and other crystals by performing recrystallization at a warm temperature. Scientists also use this method to obtain a desired substance from a solution, which is also called purification.	
<b>Summary Statement</b> I will test in which temperature condition do borax crystals grow the largest and clearest.	
<b>Help Received</b> Mrs. Buck gave advice.	