



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title Survey Says . . .	
Abstract Objectives/Goals Before you can build or plant anything you should have properly graded piece of land. Determining the boundaries or elevations of a piece of land is called surveying. Professional surveyors use a tool called a transit with special measuring poles and levels. This "high-tech" method can be very expensive. I was curious if a "low-tech" method, using a basic hose from a hardware store filled with water can come up with comparable measurements as a professional surveyor with "high-tech equipment". My hypothesis was that the results would be very close due to the fact that water levels itself. Methods/Materials The materials I used were, one clear 100-foot hose, water, a tape measure, a notebook, a pen and pencil, surveying markers, a level, a professional transit and a measuring pole. My procedure was to find an empty lot to survey and survey it using the hose and water system. I laid out the hose and filled it with water about 10 inches from each end without bubbles. Then I sealed both ends of the hose and placed both ends in the center of one end of the lot and unsealed them. After measuring from the ground to the water level, I wrote down the measurements at this zero point. (Reference) I chose 8 other points on the lot, and marked there exact location. I measured each location with the hose and water system first and then another day repeated these measurements using a professional transit from my reference point. Results My hypothesis was correct. Since water always levels itself out my results for both techniques were very close. My experiment proved that an old fashioned (and less expensive) system can compare favorably to our current high-tech method of surveying land. Conclusions/Discussion My results were very close, but the hose technique probably wouldn't be the most practical method for surveying a large or steep graded piece of land. The problem with measuring a large piece of land is that the hose could get kinked and you wouldn't get accurate measurements. The hose would be very long and awkward to handle, too. However, the hose and water method, could be used effectively for small lots with low grades for planting or construction.	
Summary Statement My project compares a "low-tech" and inexpensive method versus a "high-tech" method of surveying land.	
Help Received My dad drove me to the site and carried equipment to the site. I borrowed a transit from the Engineering Department of the City of San Bruno and received example maps and information from the Planning Department in South San Francisco.	