



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Manreet K. Dosanjh</b>	<b>Project Number</b>  31121
<b>Project Title</b> <b>Banking Your Bacteria: Examining the Correlation between Passcode Security and Bacteria Growth on Numerical Keypads</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this investigation was to analyze if bacteria culturing can allow for an accurate prediction of a four-digit pass code. This was determined by the growth of bacteria from numerical keypads. <b>Methods/Materials</b> All the needed materials for my experiment were agar plates, sterile cotton swabs, a numerical keypad, a bottle of bleach, a timer, a human volunteer, a pair of gloves, a pack of cotton balls, Sharpie, and an incubator. The methods for my experiment were to first remove all the bacteria from the keypad by bleach. Second, obtain a volunteer and ask them to type in a four-digit pass code and then light their number down on a piece of paper. Next, obtain a sterile cotton swab and swab key #1# for 20 seconds. Then, swab the sterile cotton swab on the agar plate for one minute. Do this for the remaining nine keys on the keypad. After that, place all the finished agar plates in an incubator. Finally, after two days, take the agar plates out of the incubator and count the colonies and record the results. <b>Results</b> The results from my investigation indicates that 85% of the time you will be able to get an accurate pass code from bacteria. The highest number of colonies was 178 and the lowest number of colonies was 8. The average for the highest number of colonies out of the four agar plates was 83.46 and the average for the lowest number of colonies was 29.32. <b>Conclusions/Discussion</b> In conclusion, I successfully found the results from my investigation. I learned that 85% of the time, bacteria culturing could allow for an accurate prediction of a four-digit numerical pass code. I also learned that it is important to keep your hands clean before typing in your pass code. The cleaner your hands are, the harder it will be to predict your code.	
<b>Summary Statement</b> The purpose of this investigation was to determine if bacteria culturing can allow for an accurate prediction of a four digit pass code.	
<b>Help Received</b> Mother provided transportation to needed destination. Mr. Whittington taught sanitizing methods.	