



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Varun K. Mohan	Project Number J0513
Project Title How Do I Conduct?	
Abstract	
Objectives/Goals To determine if the conductivity of distilled water changes when it is mixed with various substances and to what extent.	
Methods/Materials A LED based conductivity meter is constructed using an LED and a 9 volt battery and the leads of the meter are dipped in various solutions # (1) tap water (2) distilled water (3) Common salt dissolved in distilled water (4) Epsom salt dissolved in distilled water (5) Calcium chloride dissolved in distilled water (6) Diluted version of Common salt solution. (7) Diluted version of Epsom salt solution (8) Diluted version of Calcium Chloride solution. The conductivity is tested using the intensity of LED.	
Results LED in the conductivity meter glowed more with tap water than distilled water. Where as, for the distilled water the LED in the conductivity meter did not even glow. When I mixed the distilled water with the salts, the LED glowed brightly. The different salts [Epsom salt, calcium chloride, sodium chloride] mixed with the distilled water glowed at the same extent. When the salt solutions were diluted by distilled water, the brightness of the LED in the conductivity meter decreased.	
Conclusions/Discussion The electrical conductivity of water changes when it is mixed with various substances. Distilled water does not conduct electricity at all. Tap water conducts electricity and so do the salt solutions. When materials like sodium, calcium and magnesium are dissolved in water, they dissociate. These dissociated atoms now carry an electric charge and are called ions. When salt, sodium chloride (NaCl), is dissolved in water, the sodium atoms which have lost one electron apiece and represented by the symbol Na ⁺ , separate or dissociate from the chlorine atoms. The chlorine atoms each gain one electron in the process and are represented by the symbol Cl ⁻ . These atoms exist in equal numbers. When solid sodium, magnesium, and calcium are dropped in water their solid structure is broken up and charged ions float all through the water molecules in the solution. When electric current is introduced to the solution via the conductivity meter the movement of the ions allows the current to flow through the solution causing the LED to light. The number of ions per liter of solution will affect the flow of current through the now closed circuit. Conductivity is dependent therefore on the presence of ions as well as the concentration of ions per quantity of water.	
Summary Statement My project is about the conductivity of distilled water when it is mixed with various substances.	
Help Received My parents bought me the materials.	