



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Matt S. Ferrante	Project Number J1007
Project Title The Water is Hot, How Are Your Vitals? A Study of the Effects of Hot Tubs on Blood Pressure, Pulse, and Body Temperature	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my experiment is to determine if hot tubs have the same effects on the vital signs of a prepubescent compared to a pubescent teenager or adult.</p> <p>Methods/Materials To derive results; 12 females under the age of 13, 8 females over the age of 13, 17 males under the age of 13, and 6 males over the age of 13 were tested. During the testing, a sphygmomanometer, a thermometer, and a hot tub were used. Subject's vital signs were taken, and they sat, shoulders under the water, in a 103 degree hot tub. After 15 minutes, their vital signs were taken, and again after another 10 minutes. After this test, subjects got out and waited 10 minutes and had their vital signs taken again.</p> <p>Results When in a hot tub, the subjects' systolic blood pressure dropped after 15 minutes, then remained steady during the next ten minutes. After getting out, it rose to slightly above normal; diastolic blood pressure dropped, remained steady, and after getting out rose to slightly below normal. Pulse and body temperature rose, continued to rise, and after getting out, dropped to slightly above normal. The youths under the age of 13 had a larger change in body temperature and pulse, whereas adults had a larger change in blood pressure. Gender, on the other hand, had no serious impact.</p> <p>Conclusions/Discussion Hot tubs have varied effects on the blood pressure, pulse, and body temperature of humans. Hot tubs do not have the same effects on prepubescents as on pubescent teenagers and adults; however, hot tubs have the same effects on the vital signs of males and females.</p>	
Summary Statement My project showed how a hot tub effected the vitals of different age and gendered people.	
Help Received Mother helped read thermometers when testing multiple subjects at the same time.	