



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Kristen J. Jundt	Project Number J1123
Project Title Concrete Moisture Migration	
Abstract Objectives/Goals To test which subgrade best resists water vapor migration through a concrete floor? Methods/Materials Concrete test specimens of the same type mix were cast to model a floor slab. The concrete was sealed to the top of 12 vented buckets containing four subgrades (water, sand, soil and gravel). All of the buckets contained a specified amount of water to simulate moisture below the concrete floor. The concrete vapor emissions were measured using covered anhydrous calcium chloride test kits. Results The tests revealed vapor emission of 6.3 grams for water only, 4.37 grams of water with a gravel subgrade, 3.83 grams of water with a soil subgrade and 3.77 grams of water with the sand subgrade. Conclusions/Discussion The test results demonstrate that while many Engineer's recommend gravel as a capillary break to resist moisture migration through a slab, gravel actually causes more moisture problems because the effects of water vapor are ignored. This experiment's results are similar to a separate study completed in the 1960's. The gravel is worse because the larger voids allow water to easily convert to vapor and vapor passes through concrete faster.	
Summary Statement This Project shows that gravel used by many Engineers as a subgrade to resist moisture migration actually promotes more vapor emissions than does other subgrades.	
Help Received Dad helped make forms and helped me get the materials. Quick Signs helped make the display sign. Hugo Kevorkian, P.E. and Terry Tuell helped advise me on the technical parts of my experiment.	