



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

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| Name(s) Sahil Alim; Garrett Gwinn | Project Number J1301 |
| Project Title Comparative Testing of Cool Roof Materials to Conventional Roofing Tiles | |
| Abstract Objectives/Goals In response to Assembly Bill 32 (the Global Warming Solutions Act of 2006), on January 1, 2010, the California Energy Commission required all new residential buildings comply with Title 24 Building Energy Efficiency Standards. My objective was to learn if Title 24 compliant Energy Star roofing tiles significantly reduce the interior temperatures of residential buildings when compared to conventional roofing tiles. I believe that Energy Star rated tiles will have a significant impact on the interior temperature. Methods/Materials A model house was constructed and five different roofing materials were selected from a local roofing contractor. Four roofing tiles were selected for testing; two Title 24 compliant Energy Star rated tiles and two conventional tiles. A PVC roofing material, commonly used on commercial buildings was also selected for comparison. The model house was equipped with a temperature sensor. Each tile was positioned on the roof of the house and exposed to the heat of two 275 watt heat lamps. The model house interior temperature was measured and recorded over a two hour time period in five minute intervals. Results The two Title 24 compliant Energy Star rated tile consistently kept the house cooler than the two conventional tiles. The Energy Star rated tiles provided a 23% reduction in final interior temperature relative to conventional tiles. Conclusions/Discussion Our results proved that Energy Star rated tiles do significantly reduce the interior temperatures of residential buildings as compared to conventional tiles when exposed to a radiant heat source. This information expands our knowledge of Environmental Engineering by determining ways to design roofing systems to reduce the amount of energy used to cool your house. | |
| Summary Statement Our project is about cool roof technology and how it can reduce residential building interior temperatures, thus reducing the demand for energy. | |
| Help Received Mr. Miner, Mr. Cooper and Ms. Garland helped us prepare for our presentation. Mr. Montoya helped us select materials for testing. Wilson and Son's Roofing donated roofing tiles for testing. | |