



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> <b>Francesca McClintic; Janel Raab</b>	<b>Project Number</b> <b>S0827</b>
<b>Project Title</b> <b>Got Shade? How Hot Are Your Shingles?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this experiment is to find ways to reduce the heat that builds up on housing shingles due to the constant heat source of the sun. The process is to find an inexpensive way to help keep a house cool, reducing cooling cost, thus resulting in saving energy.</p> <p><b>Methods/Materials</b> Cut five, same size wooden boards and staple pieces of 30lb felt to the wood - after this drill a hole in the center to place the thermocouple wire. Tape the wire to the back of the board with the tip through the hole, staple down brown roll roofing material on 3 of the wooden pieces with the brown side facing up. The fourth on will be white and the last turn the shingle roofing material up-side down so the black side is facing up. Last two, build wooden frame that will hold up a shade cloth, a single and double-layered side. Then connect the wires to a Measurement Computing USB-TC which is an 8 channel temperature measurement device; after this, hook it to a computer that will gather the data over an extended period of time. Place the five wooden pieces in direct sunlight to measure the changes in temperature of the shingles and a separate thermocouple wire in the shade to measure the ambient air temperature. Let the computer run.</p> <p><b>Results</b> After collecting data, we discovered that the black shingle resulted in the hottest temperature (measured in Celsius), followed very closely by the brown regular control shingle. The white shingle's temperature was significantly lower than both the brown and black, followed by the shingle under the single-layered shade cloth. The lowest temperature was the shingle under the double-layered shade cloth. All shingles were hotter than the base-line air temperature</p> <p><b>Conclusions/Discussion</b> Results showed there will be a significant difference in temperatures absorbed by roof shingles if a homeowner use different shingles. Also our hypothesis was correct in stating that the shingle under the shade cloth would result in the lowest temperature of all the shingles. This suggests that by doing simple things, like building a simple wooden shade cloth frame to shade the roof, as well as having white shingles; a homeowner can reduce their carbon-foot print by reducing the amount of energy they use on cooling cost. Though the temperature of every shingle did rise above the air temperature, there was a significant difference, and anything done to help the environment is worthwhile.</p>	
<b>Summary Statement</b> The project is to test if adding a shade cloth makes a substantial difference in keeping the shingles of the roof cool, helping reduce cooling cost due to reducing the amount of heat transferred into the house through the roof.	
<b>Help Received</b> Mother for grammar errors, Father for supervising, and all parents for support and transportation	