



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

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<b>Project Title</b> My House Is 70°, What's Yours? A Study Comparing 4 House Exterior Sidings on Their Ability to Maintain Room Temperature	
<b>Abstract</b> <b>Objectives/Goals</b> An experiment last year determined that a building's exterior color made a notable difference in heat reflection and absorption, and in turn, the heating and cooling costs. If color can make such profound changes, then exterior sidings should make even more profound changes. This experiment was conducted to identify a siding that would be able to prevent a building's interior from leaving room temperature quickly in simulated summer and winter conditions. <b>Methods/Materials</b> A wooden box 2x2x3 ft was constructed. Four sets of walls were built with separate siding material. The tested sidings were composed of concrete, clay, slate, and stucco. Two temperature tests were conducted on each set of walls. A set of remote thermometers were placed inside with the receivers placed outside. One of the siding sets were placed on the box. An infrared heat dish was facing the box, sending approximately 90°F of heat towards the box. When the interior temperature of the box exceeded the standard room temperature limit, the test was completed. Interior temperature was taken at two minute intervals to show the interior temperature's reaction over time. The second test was done with the box being placed in an industrial freezer set at 35° F. The results were done by comparing temperature retention times. <b>Results</b> The heat tests indicate that sidings composed of clay and stone were far more effective than the stucco and the concrete sidings. Stucco ended at an average of 22.3 minutes. Concrete averaged 36.4 minutes with fairly consistent data. Slate averaged at 39.2 minutes. Clay tile lasted up to 50 minutes and an average of 49.8 minutes. During the cold test, it was noticed that all the tests times were much shorter. Concrete averaged 7.6 minutes and slate tile averaged 8.8 minutes. Adobe held the temperature for 18 minutes and an average of 11.4. This supports the findings of the heat tests. <b>Conclusions/Discussion</b> The objective of this project was reached. Through testing, two main factors determine a building's material's ability to retain room temperature. The first is the thermal mass of the object. The second is the reflective property of the object. If a strong combination is reached, then that material will have strong properties in retaining room temperature. Clay is the most effective as it has a high reflectivity and high thermal mass, making it able to retain room temperature the longest.	
<b>Summary Statement</b> This experiment was conducted to identify a siding that would be able to prevent a building's interior from leaving room temperature quickly in simulated summer and winter conditions.	
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