



CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

| Name(s) Greg T. Halverson | Project Number 22597 | | | | | | | | | | | | | | | | | | | | |
|---|------------------------------------|-------------------|------------------|-------------------|------------------|-------|------|------|------|-------|------|------|------|-------|------|------|------|-------|------|------|------|
| Project Title Cool Roofs: The "How To" on How to Keep Your House Cool During Summer | | | | | | | | | | | | | | | | | | | | | |
| <div style="display: flex; justify-content: space-between;"> <div data-bbox="71 611 535 1619"> <p>Objectives/Goals</p> <p>The problem I chose to investigate was: What is the effect of heat absorption on roof color? My hypothesis was that the darker colors black and brown would be warmer in temperature than the lighter colors beige and white. The objectives of this experiment were to find out which roof color absorbs the least heat and in turn reflects the most heat. The goal of this project is to find out how we can lower energy costs by cooling the temperatures inside the attic of people's homes.</p> <p>Methods/Materials</p> <p>I used plywood to build small model houses. Then I took four metal plates and spray painted them black, brown, beige and white. I then used a digital thermometer purchased from Radio Shack and attached it to the display with the clip provided. I drilled little holes in the back of each house model in order to measure the temperature "inside" each house. After the paint and glue had dried, I attached the track lights, which served as my artificial sunlight. I left the lights on for half an hour per color. I then began taking temperatures. I repeated the project and then I averaged the results.</p> <p>Results</p> <p>My experimental findings were that the lighter the roof color the less heat it absorbed as shown by the temperatures inside each house model. The following numbers are averaged figures between the two different times I conducted the experiment:</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Roof Color</th> <th>Room Temperature</th> <th>Attic Temperature</th> <th>Temperature Rise</th> </tr> </thead> <tbody> <tr> <td>Black</td> <td>73.4</td> <td>99.5</td> <td>26.1</td> </tr> <tr> <td>Brown</td> <td>72.9</td> <td>97.5</td> <td>24.6</td> </tr> <tr> <td>Beige</td> <td>73.4</td> <td>91.9</td> <td>18.5</td> </tr> <tr> <td>White</td> <td>72.9</td> <td>85.5</td> <td>12.6</td> </tr> </tbody> </table> <p>Conclusions/Discussion</p> <p>In conclusion my results show that lighter colors absorb less heat than darker colors. This information is helpful in daily life because we can use it when we plan to build buildings, roads, houses and even vehicles. We can also use this information to conserve electricity during summer by keeping the attic of a house cooler by having a less absorbent roof color, thereby lowering the use of air conditioning. We can also use this information when we plan what colors we wear in the summer and in the winter.</p> </div> <div data-bbox="535 611 1534 1619" style="text-align: right;"> <p>Abstract</p> </div> </div> | | Roof Color | Room Temperature | Attic Temperature | Temperature Rise | Black | 73.4 | 99.5 | 26.1 | Brown | 72.9 | 97.5 | 24.6 | Beige | 73.4 | 91.9 | 18.5 | White | 72.9 | 85.5 | 12.6 |
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| Summary Statement My project is about trying to find out which color of roof absorbs the least amount of heat. | | | | | | | | | | | | | | | | | | | | | |
| Help Received Father helped install and build house models. | | | | | | | | | | | | | | | | | | | | | |