CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1205

Project Title
Whether the Weather Is Hot, Whether the Weather Is Cold

Abstract

Objectives/Goals
The objective of this project was to determine which type of insulation will keep a house at room temperature during extreme weather: fiberglass, cellulose, or foam.

Methods/Materials
The three types of insulation, fiberglass, foam, and cellulose, were tested inside of a box constructed of drywall and 2 by 4 studs. The box was sealed with drywall compound. Each type of insulation was tested inside the box and the temperature was monitored by a wireless indoor outdoor thermometer. The box was first placed in a preheated oven at 170 degrees. The temperature inside the box was monitored every 15 minutes until the temperature inside of the box had risen 10 degrees. Next the box was removed and allowed to cool to room temperature. Finally the box was placed in a refrigerator and again the temperature was monitored every 15 minutes to see how long it would take for it to drop 10 degrees. This procedure was repeated with the fiberglass insulation and the foam insulation. Each type of insulation was tested two times each in the hot and cold. I only tested each twice because the other variables were controlled (oven temperature and refrigerator temperature).

Results
The results showed that the cellulose insulation took the longest time to change temperature and therefore it resisted the heat and the cold the best. These results show that homes using cellulose insulation will be the most cost effective when it comes to heating and air conditioning. Also, because cellulose insulation is made from compost paper that has been soaked in chemicals, this insulation would be the best choice for creating an eco friendly home.

Conclusions/Discussion
After these experiments were completed and the graphs put together it was quite amazing to see the final results of this project. When doing the heat testing it was found that it took cellulose an hour before it started to rise in temperature but foam immediately rose in temperature.It was also found that in the cool resistance testing it took fiberglass 30 minutes before the insulation started to rise in temperature. In the end cellulose won out over the other insulations with fiberglass following in second, and foam coming in last. If this project were to be done again temperature gauges would be place every one inch or so inside of the box so that the speed of the heat and cold seeping through the insulations could be taken note of.

Summary Statement
Which insulation will keep a house at room temperature during extreme weather; fiberglass, cellulose, or foam?

Help Received
Father helped use power tools.