CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
J2228

Project Title
Double Paned and Triple Paned Windows

Abstract

Objectives/Goals
To find out either the single, double or triple paned; clear glass or tinted glass windows would be the best to keep the house at room temperature under the hot sun. If double or triple paned windows could keep the house cooler in the summer or warmer in the winter, they would help to save energy by requiring minimal air conditioning or heating to keep the house at room temperature.

Methods/Materials
- Build a box which consists of five walls: a single clear glass window, a double clear glass window, a triple clear glass window, a single tinted glass window, and a double tinted glass window.
- Install a light bulb (representing the sun) in the center of the chamber to generate heat. It was placed at the center to ensure the same amount of heat go to each window for comparison.
- Use 48W, 200W, 300W light bulbs to represent warm, hot, and very hot day. Temperatures of the window surface away from the bulb were recorded and compared.
- Next experiment was to see the effects of glass layer distance in the double paned windows.
- Next experiment was to see the effects of glass layer thickness
- Last experiment was to see the effects of layer materials such as mica and flexi glass on temperatures.

Results
- The order of the best to the worst performers in keeping the temperature down was triple, double, and single clear glass windows. However, a single tinted glass window was warmer than the single clear glass. And a double tinted glass window was better than a single tinted glass window, but not as good as the double clear glass window. It was different than common thinking that the tinted glass should be cooler than the clear one.
- In double glass window, the larger the distance between the layers, the cooler the window was.
- Also, the thicker the glass layer, the better it kept the temperature down.
- Different window materials had different cooling characteristics.

Conclusions/Discussion
The experiment was done to understand the performances of single, double and triple paned windows in keeping the house at room temperature and saving energy. We should use double or triple paned windows to save energy.
FURTHER RESEARCH:What differences would it make if the double paned windows were made of different materials, or tinted glasses were in different colors? What results we would obtain if the picture frames were made out of metals as in real life rather than plastics as in this project?

Summary Statement
The experiment was done to understand the performances of single, double and triple paned windows in keeping the house at room temperature and saving energy.

Help Received
Father helped to cut wood using power saw and install light socket with wires.