



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

Name(s) Jack Smith	Project Number 38363
Project Title Constant Comfort	
Objectives/Goals The objective of this experiment was to assess if commonly available recycled materials used as insulation would be as effective in maintaining a consistent temperature in a structure as store bought insulation.	Abstract
Methods/Materials Materials list: (2) 4 x 8 x 1/4inch Plywood Sheets; (18) 8ft x 1 inch x 1 1/2inch wood; 3.1 lbs Shredded paper; 36 Sq ft Corrugated cardboard; 6 Sq ft 1 1/2inch Styrofoam insulation; Staples; Glue; Screws; Drill; Saw (adult supervision); Duct Tape; Scale; Temp recorder x 5, Ruler. Methods: <ul style="list-style-type: none">· Construct four boxes, 3 containing different types of insulation. One with hollow panels for walls. Mark each box to determine which insulation was used. (Each panel 1.5 inches thick, using a scale to assure equal weights of insulation in each panel.)· Gather 5 continuous monitoring temperature recorders. Label 4 to correspond with boxes and one outside.· Place temperature recorders outside for 12 hours to get a baseline reading for each.· Place temperature recorder in corresponding box, place each box outside in an unprotected location. Place temperature recorder labeled outside next to boxes.· Close all boxes and seal air gaps between panels with duct tape.· Leave boxes outside for 4 days.· Open boxes and remove temperature recorders.· Remove data strips from each temperature recorder, making sure to accurately label each one.· Correlate data strips to assess effectiveness of insulation.	
Results After looking at the data recorded I found the temperature in the box insulated with corrugated cardboard changed the least. The range from the highest outside temperature to the lowest was 37 degrees. The range inside the box insulated with corrugated cardboard was 26 degrees. The box insulated with paper had a range of 28 degrees and most surprising, the box insulated with store-bought Styrofoam insulation had a range of 30 degrees. Only the hollow core panels did worse with a range of 31 degrees. This proves that using recycled materials could be used as an effective insulation.	
Conclusions/Discussion	
Summary Statement As measured by the temperature recorders I used in my project, I found that recycled materials can be used to make insulation as effective as some store bought material.	
Help Received I designed the experiment myself. My father helped with the use of power tools to cut many of the pieces then I built and insulated the boxes. My mom sourced the temperature recorders and taught me how to graph my results.	