

Heat Insulation Variables

Project ID#

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Q1: Research Question/Engineering Goal

My research question is what material insulates and keeps in heat the best. The reason I am attempting to solve this

problem is to fix expensive heating bills. I will try to do that by making walls similar to a house in a plexiglass box and

filling those walls with my different materials to see which material insulates the best. My independent variable is the

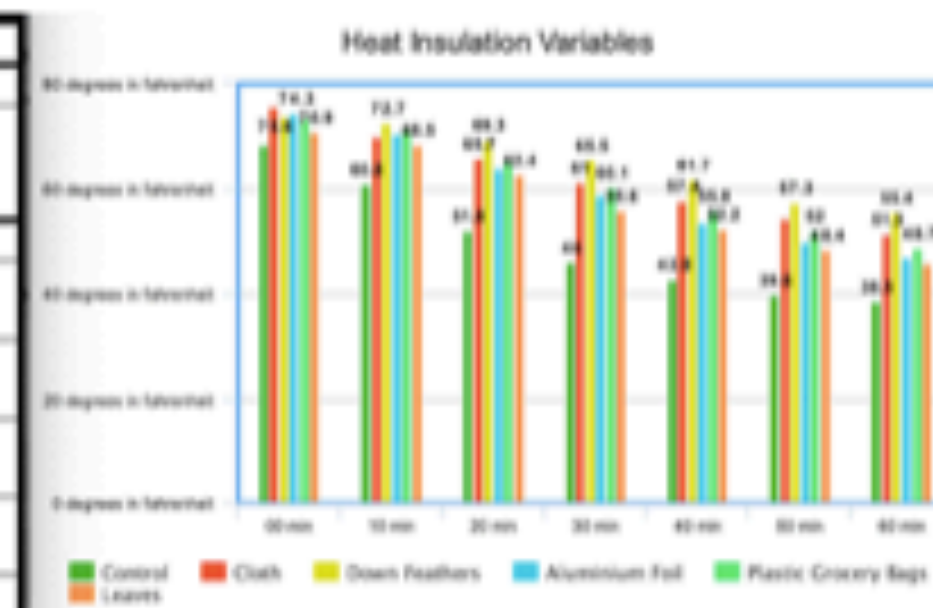
material that I am using. My dependent variable is the temperature inside the box and the controlled variables are the

box I use, the temperature in the refrigerator when I test and the amount of time I am testing. My hypothesis is that of

the materials I use cloth will be the best.

Q3: Data Analysis & Results

Materials/ Temperature in (°)	Heat Insulation Variables						
	Time in Minutes:						
	00	10	20	30	40	50	60
Control	68.4°	60.8°	51.8°	46.0°	42.8°	39.6°	38.5°
Cloth (Cotton)	75.6°	70.0°	65.7°	61.0°	57.4°	54.1	51.3°
Down feathers	73.9°	72.7°	69.3°	65.5	61.7°	57.3°	55.4°
Aluminum foil	74.3°	70.5°	63.7°	58.6°	53.4°	49.8°	46.9°
Plastic grocery bags	73.6°	71.6°	65.3°	60.1°	55.8°	52.0°	48.7°
Leaves	70.9°	68.5°	62.4°	55.6°	52.2°	48.4°	45.5°



Q2: Methodology/Project Design

1. I will build, with my parents supervision, a plexiglass box with hollow walls and a thermometer in it.

2. To test I will fill the hollow walls with my different materials and measure the temperature inside the box.

3. To see which material insulates the best I will put the box in a refrigerator at room temperature and check the temperature

inside the box every 10 minutes over an hour.

4. Then the material that kept in the heat the best over 1 hour inside the box will be the best insulator of the materials used.

Q4: Interpretation & Conclusions

My hypothesis was that of the materials cloth would do the best. My hypothesis was

supported by my personal knowledge that clothes are made out of cloth and clothes are

designed specifically for keeping humans warm. My data disproved my hypothesis by

showing that down feathers insulated much better than the cloth I tested. A limitation to

my project was that the thermometer I was using could not measure freezing

temperatures so I had to test in a fridge instead of a freezer. Some things I could do

better are test different materials and get a new thermometer to measure in lower

temperatures.