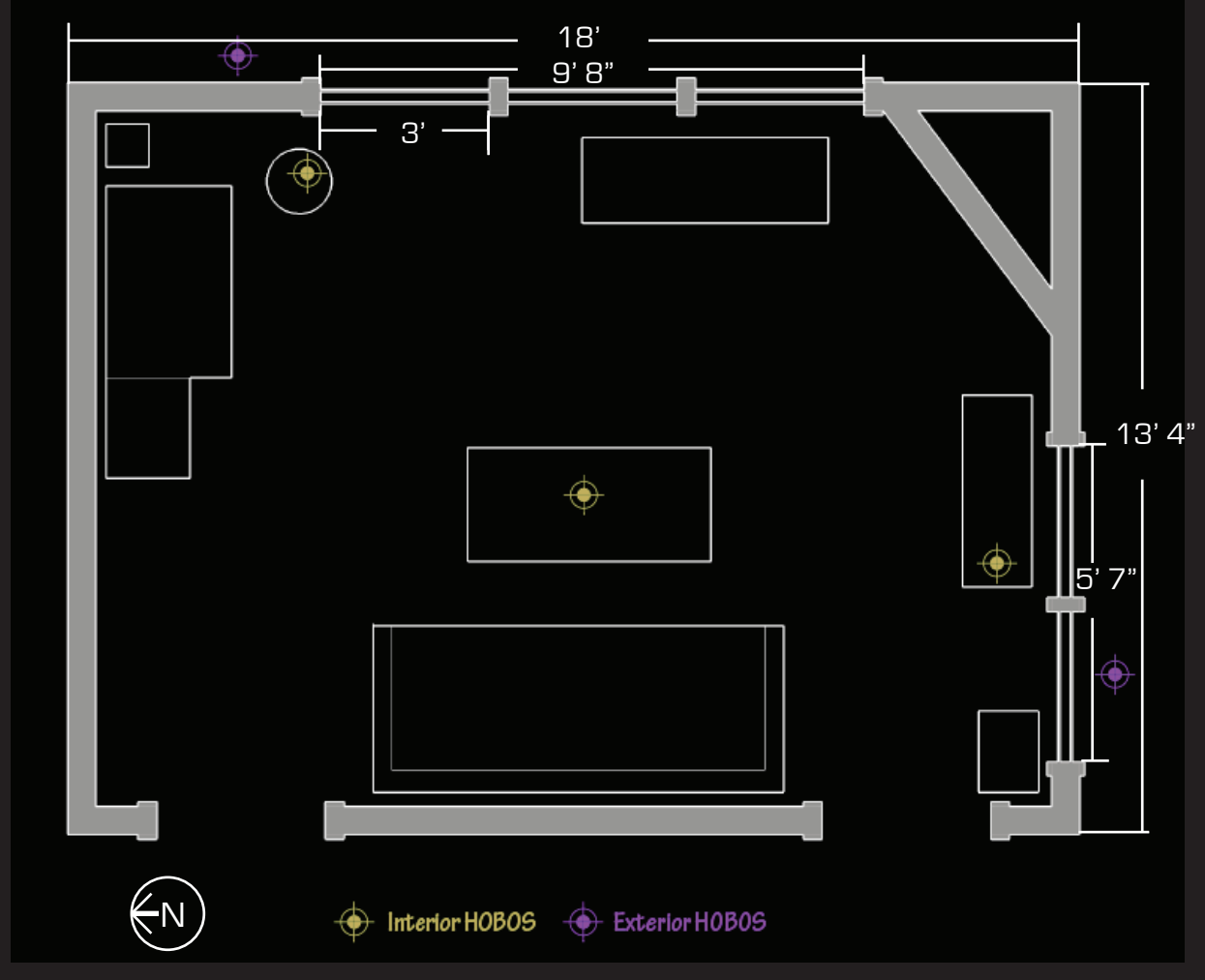


LOW-COST SOLUTIONS TO INSULATING YOUR HOME'S WINDOWS

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The space that we decided to study is a living room on the third floor of a multiplex located at 13th and Mill in Eugene. The room has two south and three east facing windows that enable the space to have a stronger connection to the outside environment. This turn-of-the-century building has newly installed double pane vinyl windows. For our study we wanted to determine the heat loss that occurred overnight. We decided to cover the curtainless windows with different textiles that varied in materiality and color. With are findings we wanted to determine an alternative low-cost substitution to standard insulated drapes.



We believe that by adding drapes to all windows in a room that is 35% glazed, we can stop the temperature drop at night by at least 5°F



East Windows

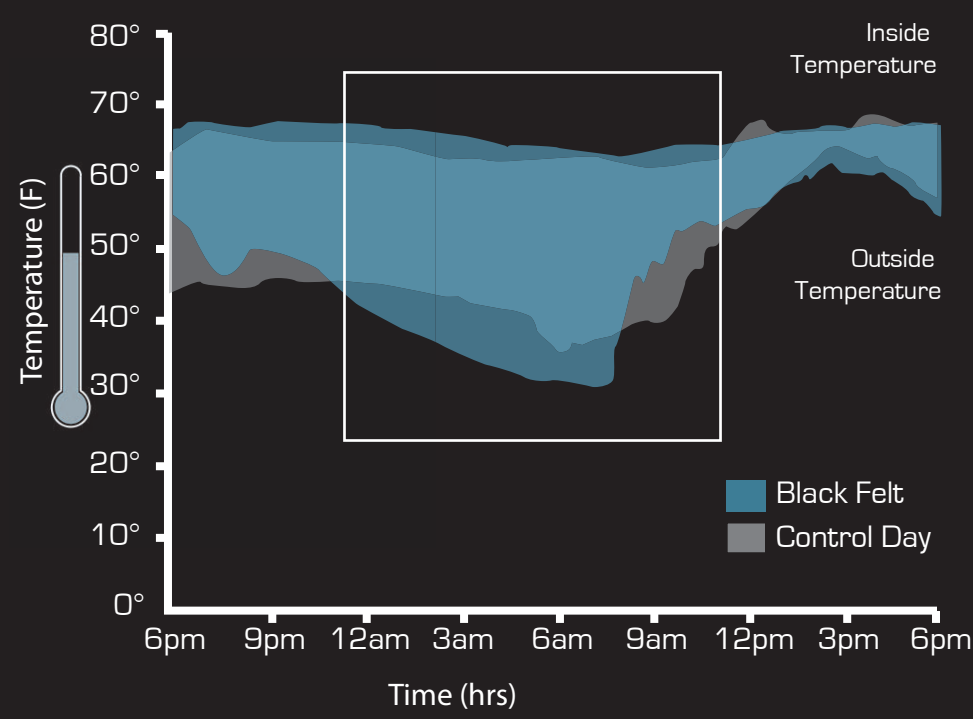


South Windows

Methods for Testing

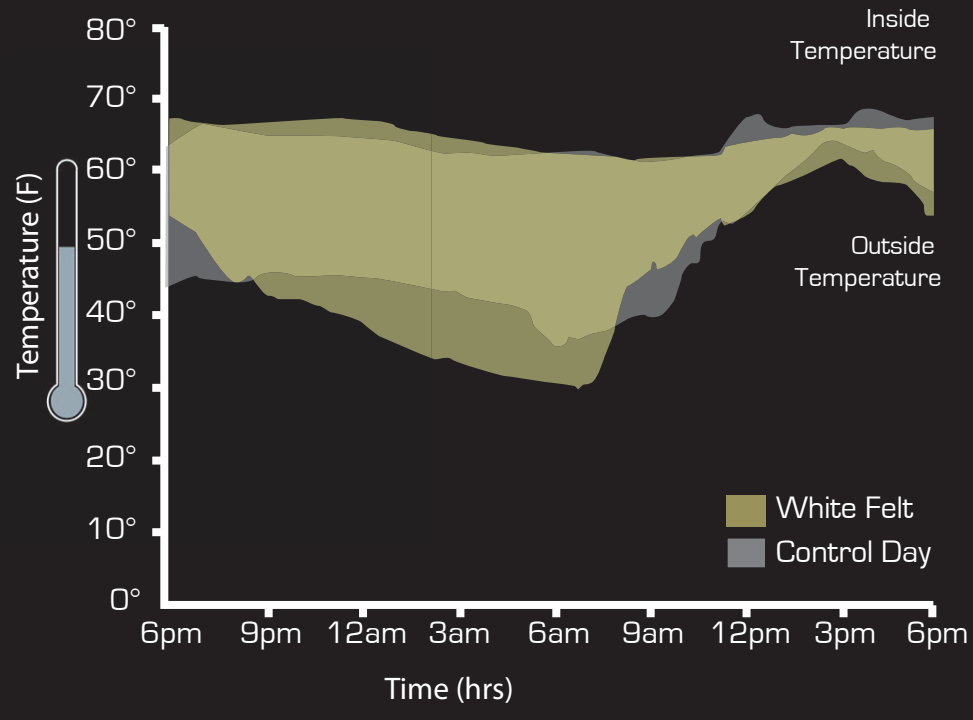
- 1) Use HOBO devices in outside and inside to gather temperature data when windows are left uncovered [control day].
- 2) Place different drape materials over windows.
- 3) Turn heat up to a constant temperature reached at 6pm, then turn off.
- 4) Measure heat loss from evening until next morning.
- 5) Collect data graphically to see which materials reduced heat loss the most.

BLACK FELT



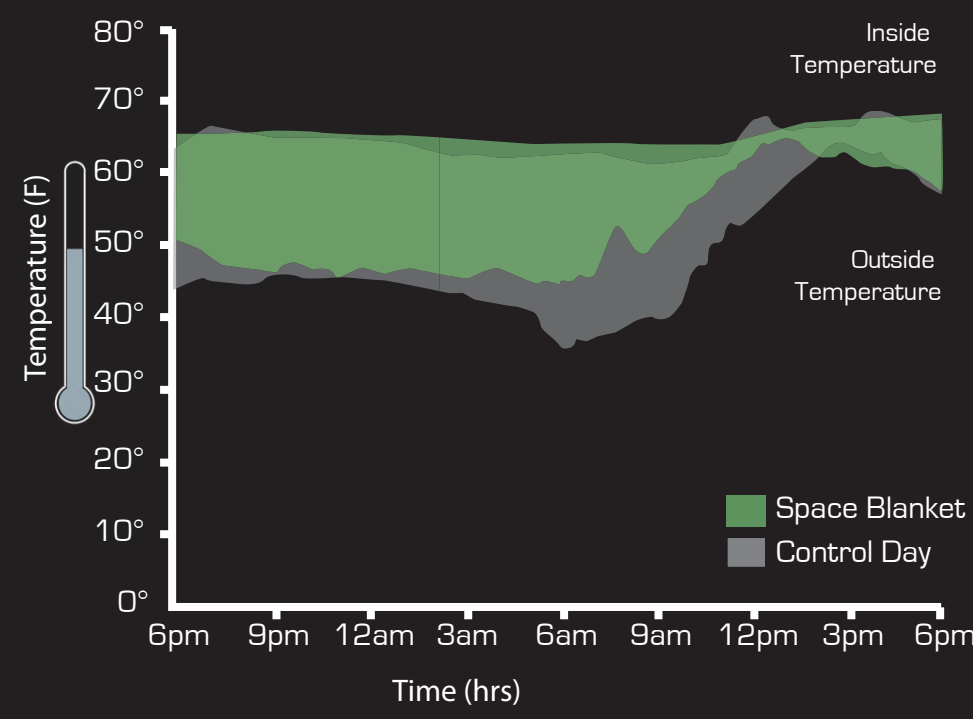
The black felt appeared to perform the best among all the fabric choices we considered. Even when the outside temperature dipped well below the control day the inside temperature stayed a comfortable temperature. We believe that this is because the black color felt's emissivity was higher than the lighter colored fabrics. This means it held in the rooms heat for a longer period of time.

WHITE FELT



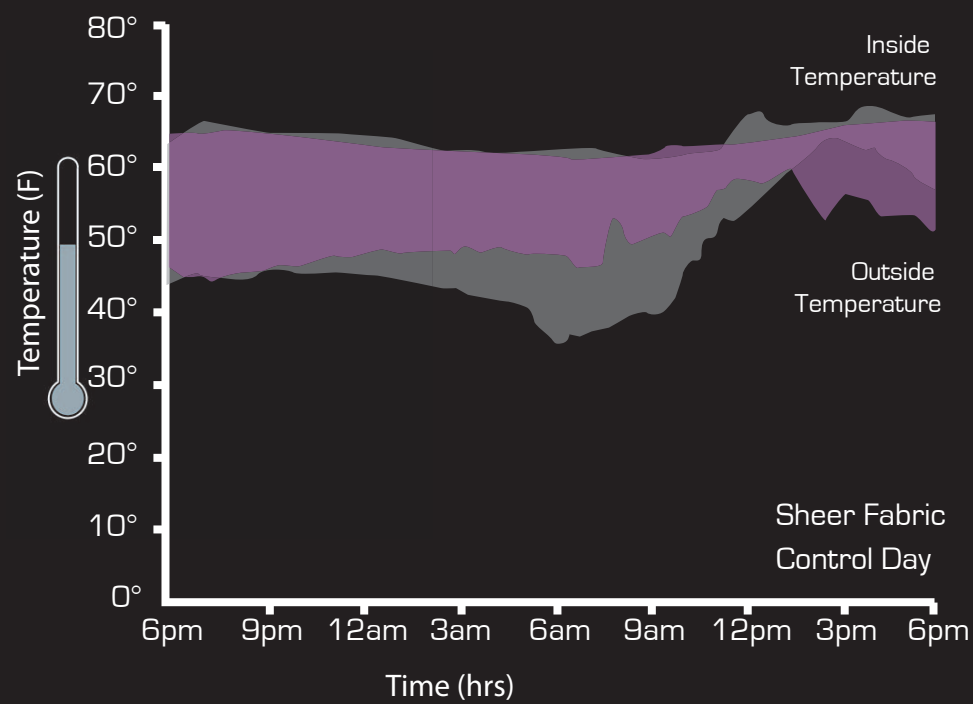
The white felt performed well, but not up to the same standards as the black felt. Since the white felt was not holding as much heat, we determined that color was the only variable that contributed to the results. We also noticed that the felt materials caused a more even temperature regulation inside the room compared to the control day. Since both black and white felt performed better than any other method, we determined that thickness of material contributes to thermal insulation

SPACE BLANKET



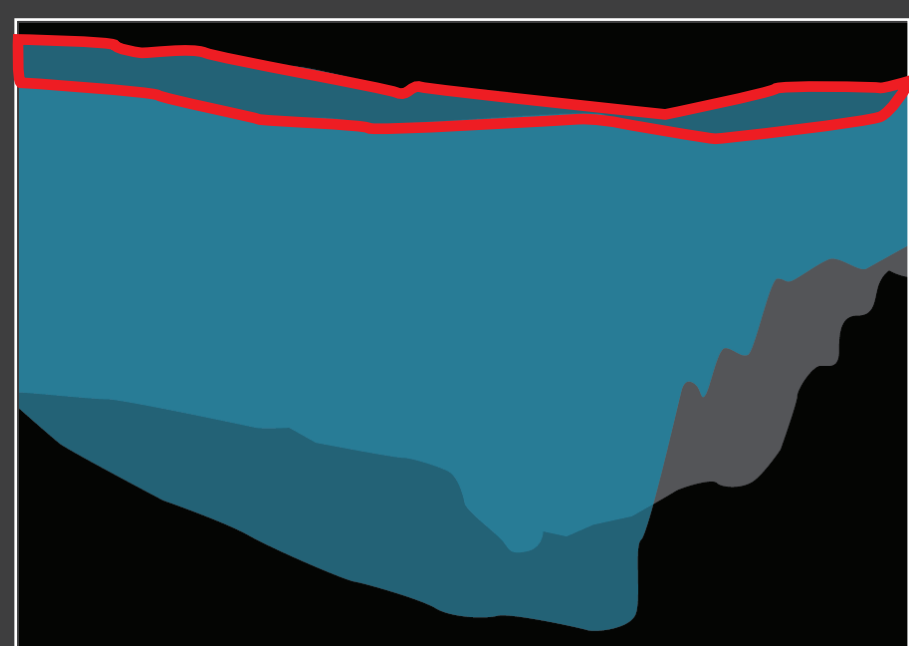
We thought the space blanket material would perform the best among all materials because of its heat reflecting qualities. We were surprised with the results compared to the felt because it did not perform as well. We believe that the results may be caused by the space blanket reflecting the heat back outside instead of bringing it in the room.

SHEER FABRIC



For the sheer material, we noticed that even though the outside temperature was warmer, but the indoor temperature was lower than the control day. These results are shocking and seem to defy common sense. We determined that sheer fabric would be efficient during summer months with high outside temperatures.

CONCLUSIONS



Heat Retained with black felt = 3 to 4°F

Based on our findings, we determined that the best performing material was the black felt, and it could retain heat by 3 to 4°F. The sheer fabric and space blanket seemed to have reverse effects, that performed even worse than the control day without any window covering. On a cost versus performance comparison based on R-values, no covering is the best deal, yet if there needs to be a cover, the most frugal purchase would be the space blanket.

