CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34181

Project Title
Increasing Albedo: Determining if the Composition and Color of a Roof Impacts Interior and Exterior Temperature

Abstract

Objectives/Goals
Does the composition of a roof that has been painted white, and therefore the albedo of the structure increased, impact the interior and exterior temperature of the structure?

Methods/Materials
9 bird houses of same shape and size, 21 asphalt shingles, 72 terra cotta tiles, one paint sprayer, 1 bottle of white Behr house paint, 1 bottle of Gorilla Glue, 18 thermometers. Paint three bird houses white and do not attach any roofing materials to those houses (control). Attach 7 strips of asphalt shingles to each of the three houses and then paint the structures white. Attach 24 terra cotta squares to each of the three houses and then paint the structures white. Place a thermometer on the exterior of each structure by using a rubber band and in the interior of each structure. Monitor and record the interior and exterior temperatures every ten minutes.

Results
Control Average Temperature Change for interior was an average change of -10 Celsius, Exterior -9.7 Celsius

Tile Average Temperature Change for interior was an average change of 7.3 Celsius, exterior was -14.7 Celsius

Shingle Average Temperature change for interior was an average change of -8.7 Celsius, exterior was -15 Celsius

The tile kept the interior the warmest.

Conclusions/Discussion
My conclusion is that the exterior temperature readings all showed a decrease of approximately ten degrees Celsius while the tile interior temperature was the only variable to show an increase in temperature. Individuals wanting to conserve energy and regulate the interior temperature of their buildings should use tile roofing materials.

Summary Statement
My project investigated roofing materials that would regulate the interior temperature of a structure, after the albedo had been increased, in order to decrease the amount of energy used to regulate the interior temperature of a structure.

Help Received
Mother helped me print and finish my bibliography. Father helped me test, prep for testing, and review data.