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Project Number

J1311

Project Title

Eggshells to Save Lives: Lowering Rate of Combustion with Calcium Carbonate

Abstract

Objectives

The objective of this project is to determine the rate of combustion of wood by using various types of paint mixtures that contain different concentrations of egg shell powder. We will measure the time it takes for the wood to ignite. After researching, we hypothesize that the higher the concentration of the egg shell in the mixture of paint, the more time it will take for the wood to ignite.

Methods

Approximately 50 dozen of egg shells were collected from a local restaurant. After washing and drying the eggshells it was turned to powder with a blender. Into 50mL paint samples (Interior Latex Paint, Water based paint, Low Luster Paint, and Oil Based paint) various concentrations (5g, 10g, 15g, 20g, 25g, 30g, 35g, 40g, 45g, 50g) of egg shell powder was added and mixed. 132 pieces of wood (11cm x 7cm x 2cm) was cut and painted. After drying the wood for 2 days, each piece of wood was tested by igniting with a torch. The time it took for the first flame was recorded and analyzed.

Results

Based on our data we can conclude that the water based paint took the longest time to ignite. Our trials ranged from zero concentration (no egg shell) to 50g of egg shell concentration. The interior latex paint ranged from 60.33 sec 132 sec on average. The water base paint ranged from 90 sec to 180 sec. The low luster pain ranged from 62.33 sec to 159 sec. The oil base paint ranged from 44.33 sec to 110.67 sec. The water base paint with the highest concentration of eggshells (50g) took the longest time to ignite, averaging 180 sec, respectively. As we stated in our research, people have approximately 2 minutes to escape a fire. With our findings, we could possibly lengthen this time to 3 minutes, which could help save many lives.

Conclusions

The results observed from our study supports the hypothesis that the higher the concentration of the egg shells in the mixture of paint the more time it took for the wood to ignite.

Summary Statement

We will determine the rate of combustion of wood by using various types of paint mixtures that contain different concentrations of egg shell powder.

Help Received

We researched and planned the experiement ourselves. Consulted with our science teacher for scientific inquires. Recieved support from our parents in purchasing the materials needed.