CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36585

Project Title

How Do the Temperature and the Length of the Tube Affect the Speed of the Wind Produced?

Abstract

Objectives/Goals

My project investigated the relation between different temperatures of PVC pipes and the speed of wind going through them, as well as the length of the heated PVC pipes and the speed of wind going through them.

Methods/Materials

My project was split into two experiments, so I will be stating a paragraph for each one.

The first experiment the relationship between different temperatures of a PVC pipe and the speed of the wind going through it. A 40 cm length of PVC pipe was heated to 93, 110, and 127 degrees Celsius in an oven. A hair dryer was used to blow wind through an additional cold PVC pipe connected to the heated ones. Each increase of temperature was tested 10 times. The wind speed was measured with an anemometer in kilometers per hour (km/h). In this experiment, as the temperature of the PVC pipe increased, the speed of the wind going through it increased.

This project investigates the relationship between the length of a heated PVC pipe and the speed of wind going through it. Different lengths of PVC pipe were heated to 93 degrees Celsius in an oven. Using a hair dryer, wind was blown through an additional cold PVC pipe that was connected to the heated pipes. Each length of PVC pipe was tested 10 times. The wind speed was measured by an anemometer in kilometers per hour (km/h).

Results

In the first experiment, as the temperature of the PVC pipe increased, the speed of the wind going through it increased.

In the second experiment, as the length of the heated PVC pipe increased, the speed of the wind going through it varied. At the second level it increased, then slightly decreased when at the third level.

Conclusions/Discussion

With my experiments I wanted to explore the possibility of making wind-based energy more efficient, by attempting to speed up the wind that is used to make the energy, thus increasing energy creation. Seeing how without tubes the hair dryer output 27.5 km/h speeds, and the speeds I was getting averaged to about 33 km/h (roughly), the increase margins were not probably enough to be efficient. More energy was probably used in the heating and cooling of the the PVC than the extra created. However new experiments that test the materials, shapes of pipes, and methods of heating/cooling may suggest the usage of the idea.

Summary Statement

I tried to increase the speed of wind going through PVC pipes that were heated to different temperatures and cut to different lengths.

Help Received

My brother and father helped me form the question of the project from an idea that I had. My brother found examples in innovations (such as the Bladeless Fan), which proved the possibility of the idea.

Preliminary