



2010 MASSACHUSETTS CLEAN TECHNOLOGY AWARDS

A Program from The Foresight Project Inc; www.theforesightproject.org



Region VI: Boston

Joshua Donald: The Engineering School, Hyde Park

Climate Science Award:
"Hurricane Preventer"

About Me:

My name is Joshua Donald; I was born and raised in Boston, Massachusetts and have lived here all my life. I am eighteen years old, and trying to pursue in a career in architecture. I am a senior at the Engineering School in Hyde Park, Massachusetts where they offer wonderful programs in such subjects.

I have been learning about architecture since the ninth grade. I attended a program at the Boston Architectural College (BAC) Summer Academy. This program allowed me to get a hands-on experience in architecture, urban design, interior design, and landscaping. I did the BAC program for two summers, the first as a student learning about different areas of designing, then the second year as a mentor to other high school students. After BAC, I joined another architecture program called Architecture, Construction, and Engineering (ACE) Mentor Program. The program allowed me to interact with real life engineers, architects, and construction workers who came into the program once a week, mentoring high school students.

This fall, I plan on taking architecture at the Boston Architectural College. I'm only eighteen years old, and I feel that I am already on the path of my success. Adults always told me that the only person who can stop you from succeeding is yourself. I am willing to challenge myself to succeed every single day of my life, and now it's starting to pay off!

My Project:

My purpose for this science fair project was to develop a device that would prevent hurricanes from destroying or collapsing houses, even from winds in excess of 100 mile per hour. The devastation caused by hurricanes is a major issue for our world besides globe warming, earthquakes, volcanoes eruptions, etc. This idea could save thousands of lives from hurricanes disasters. I wanted to make sure that it was inexpensive enough to be practical: I would probably think my invention would cost hundred of thousands of dollars.



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Problem Statement:

The problem I intended to solve was to develop a prototype for hurricane prevention for houses. A 74 mile per hour wind is the starting point which weather experts consider a storm to be a hurricane. For my experiment, I placed a circle (a bicycle wheel) that would spin really fast, e.g. at 6.28 radian per second. Then I added wind protectors that can extend up and down to counteract the amount of forces the wind that is directly hitting the house.

Approach:

The approach for investigating the problem of hurricanes is by doing research of the cause and effects of hurricanes. And from that approach, to develop a device that could prevent this disaster.

Results: I will be converting the measured speeds of revolutions per minute (radians per second) into miles per hour. I am still working on the prototype, and do not have final data. Preliminary calculations based on my measurements indicate the following:

Procedure:

For a bicycle wheel do the following: take the diameter of the wheel, multiply by Pi.

Example: 26" wheel * 3.14159/12 = 6.8 feet per turn. If the wheel is spinning at 380 RPM, then at 6.8feet/turn = 2584 feet per minute * 60 = 155040 feet per hour *1/5280 feet/mile = 29 MPH.

Conclusion:

This project contributes to the area I work in because it's taking an Idea and constructing that idea to make it even more efficient. By designing this prototype, I used my architectural skills and tried to extrapolate from the prototype to a building, using square feet and scaling principles.

I am looking forward to continuing my work on this project.