Research Plan for Engineering Design Projects

Define a need/identify problem

When electricity goes out, how can I design a device that will help me cool off?

Especially with recent hurricanes and electricity outages, families either went without a way to stay cool or they used a generator. My idea is to design a low-energy using product that would help keep people cool and possibly run off of a solar panel lighter, cheaper

DefineTarget User for your product:

People who have limited income (possibly 3rd world countries but have a lot of sun shine available) or people who experience power outages and have a need to stay cool (like during hurricanes or wind events that make electricity be interrupted). .

If there are similar products out on the market, how will your idea be different and what do they fail to do or lack? (that your project will improve upon)

There are air conditioners on the market but they are expensive and consume a lot of energy; I have not seen a simple, homemade solar powered one that someone could construct during electrical outages and use to keep cool.

Design criteria:

- Design/Materials:
  - built from common household items
  - Easy to build and use a USB connection to a charged laptop to power the fan to blow over the ice (if there is no generator available during power outages).
  - A direct current (DC) fan would be required to connect to a solar with a USB outlet to connect to a charged laptop. Cost: the actual apparatus that I have in mind would be less than $25 Safety:
  - Safe to use

Materials & Design Plans

1-2 pvc pipes, 1 ice chest, 1 fan, 1 desk fan with a USB port, a block of ice and a knife ; USB clock or laptop charged; drill; silicon, water, safety goggles;

Photos of my finished product.

DATA ANALYSIS:

After building and testing the homemade cooling unit from common household items and an inexpensive solar panel operated fan, I will determine if it was easy to build and would work during electrical outages.

RISK AND SAFETY:

My risk is getting hurt when drilling into the ice chest for the fan and the pipe; possible fan shorting out if water is poured on it; (the pvc pipes did not have to be cut). A parent will supervise and I have experience using power tools. Eye goggles will be used to protect eyes when drilling. I will not be around any water when working with power tools.

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