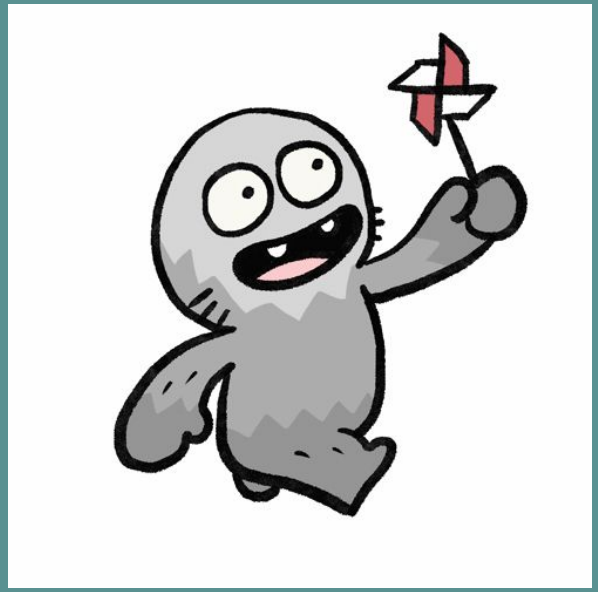
Lifting with the wind



Question

How much weight can a wind turbine lift?

Hypothesis

the windmill can only lift one lego figure and the string would break, It will break the string because of its weight.

Variables

Independent variables: The weight of the object being lifted

Dependent variable: The time it took for the object to be lifted

COntrolled Variable: The tower nad Nacelle height, fan speed, the distance the fan was form the wind, and the length of the yarn.

Background and Research

axle A shaft or rod that connect and rotate wheels.The flat wide section of an implement or device.
blades such as an oar or propeller.The assembly of blades hub and shaft. The central of a rotor that holds the blades.

Research

Rotor The assembly of blades hub and shaft .

Hub The central of the rotor that holds the blades.

Tower The main support structure for nacelle and rotor.

Nacelle A streamlined housing for something on the of the aircraft

The straw (0.020) WAs lightest to lift but took the longest 28.56 seconds.Ithink because of the straws length (21 cm).

The origami pig (0.045) took 15.76 seconds to lift.1 lego figure (0.125oz) took 19.10 second to lift. This proved my Hypothesis wrong because the string did not break when it lifted the lego figure.Next,we tried to lift a pencil(0.180oz) but failed the last object we tried to lift was2 lego figures (0.245oz)but like the pencil it could not lift them.With how tall the tower was (28cm) the fan had to be lifted (placed on top of two books) and tiled to hit the blades coming out of the nacelle that was 21 cm tall.

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Materials

Object	Straw
Origami pig	1 lego figure
Pencil	
2 lego figure	

Procedures

1.Fill the base of the tower with rocks in the bottom.

2.Drill hole in each side of the Nacelle bottle.

3.Connect 2 straws by tape this goes inside the Nacelle bottle.

4.Connect the Nacelle to the tower.

5.Measure 1 cm by 6cm paper baldes fold and tape sides together.

6.Glue to either ends of the straw and let it dry.

7.Make the paper clip a t shape then tape the top part of it to the straw in between the blades the long part goes through the connected straws in the nacelle

8.Add the string to the back of the straws in the nacelle.

9.Set up the fan so the wind can hit the blades.

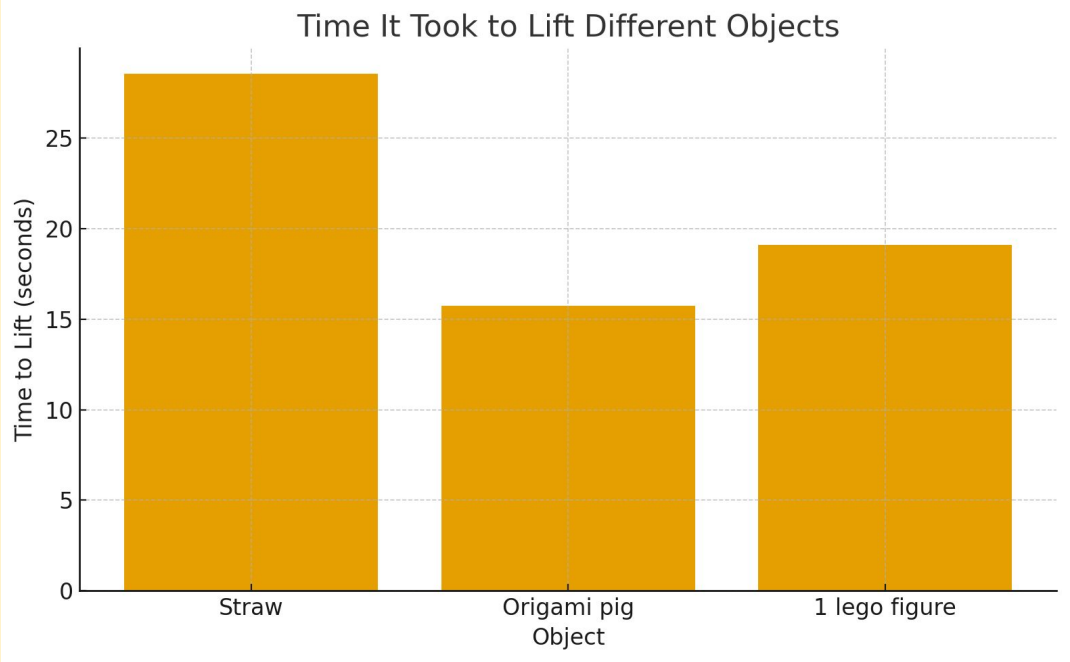
10.Now attach the item to the string and see if it can lift it.

Data Table

Object	weight	time it took to lift
Straw	0.020	28.57 seconds
Origami pig	0.045	15.76 seconds
1 lego figure	0.125	19.10 seconds
Pencil	0.180	could not lift
2 lego figure	0.245	could not lift

Graphs

Bar Graph



Observations

Observation 1: If you curve the blades it will not spin.

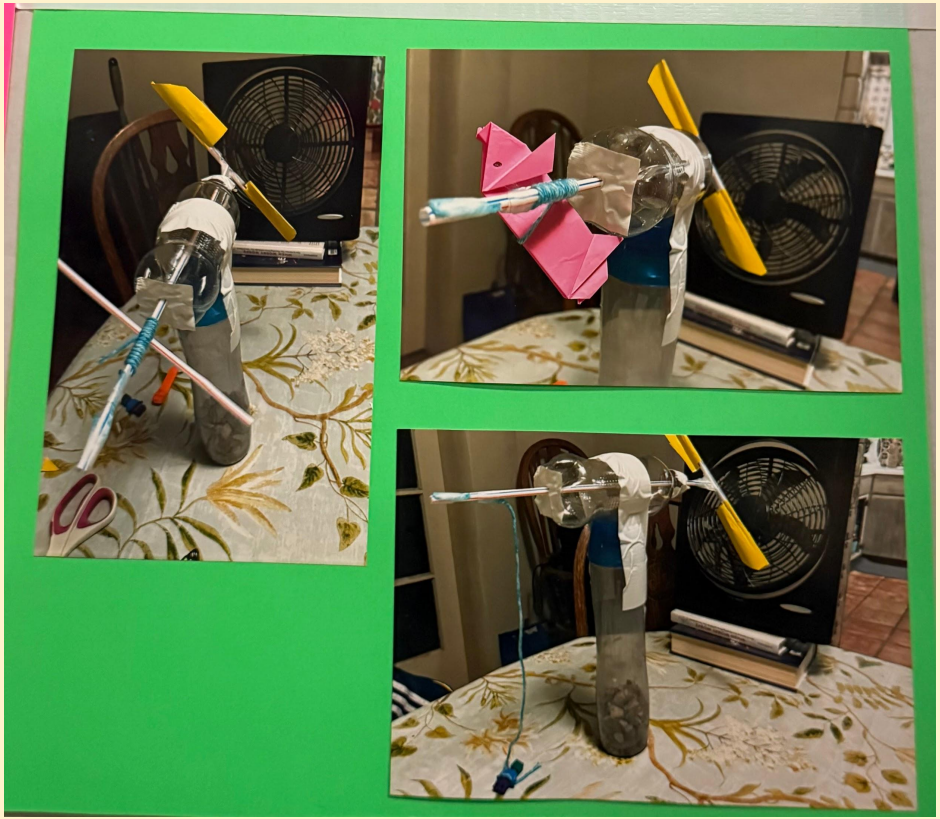
Observation 2: I learned if I cut the corner of the blades the blades will spin faster.

Observation 3:If the blades are small it will not spin.

Data Analysis

Information from the bar graph - the straw took the most time to lift the pig took the least time to lift and the lego figure was in the middle.

Pictures (make sure none of the pictures are of the face or shows faces.)



Conclusion

My windmill could only lift one lego figure at the most which weighed(0.125 oz).

Bid the results or contradict the hypothesis no, I thought the string would break at one lego figure but it lifted it.

How much you improve or change the experiment I would have done bigger wind turbines a with better fan and stronger material to use

Research

The first wind turbine was built in 1940 vermont USA .A windmill is a clean power source that produces no gas emission is gases in earth’s atmosphere that trap heat. Wind power is a form of a solar energy.The sun heats pressure, which in turn creates wind as air flows from high pressure to low pressure areas.This is what all the windmill energy goes mostly to generate for a wide of applications, from power in individual homes to supplying national power grid.

References

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