CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
J0123

Project Title
Watt's the Deal with Waterwheels?

Abstract

Objectives/Goals
Question to be addressed: Does the paddle angle and separation change how much power an Overshot waterwheel could make?

Methods/Materials
I first built a waterwheel according to design instructions I found online. Testing waterwheel: Place waterwheel in a pan. Place a pan around 42 cm above the waterwheel and 2cm away. Fill pan with a liter of water. Place wave maker in the pan. Connect multimeter to DC motor Turn on multimeter. Set multimeter to 200 milliVolts. Turn on wavemaker. Set waver maker to W3. Check multimeter results . Record results. Repeat until all results for the current category is listed. Turn off wavemaker. Refill the correct amount of water. Change paddle placement. Repeat steps 6 - 13 until all categories are tested

Results
The outcome of my testing on the amount of paddles a waterwheel should have and the angle at which the paddles should be at, lead to showing 16 paddles on a waterwheel are the optimum choice, instead of 8 paddles. As well the 60° paddle angle would being the best result for the angles of a waterwheels paddles, rather than 180° paddle and 90° paddle.

Conclusions/Discussion
Once I concluded my test on the separation and angle difference on waterwheels. I found my hypothesis for the separation of paddles was supported. A part of my original hypothesis stated the 16 paddle separation will probably produce more energy than 8 paddle separation. Which corresponds with the results of more paddles equaling to more energy and less paddles not being as effective, showing 16 paddles are superior to 8 paddles. Furthermore my hypothesis for the angle measurements wasn't supported. The hypothesis had claimed the 90° paddle angle will probably produce the most energy and the 60° paddle angle would probably be at the mid point of energy production while 180°paddle angle will produce the least amount of energy. Showing that my hypothesis was unsupported because the results show 60° was better at creating energy compared to 90° or 180°.

Summary Statement
Paddle angle and separation does change how much power an Overshot waterwheel could make.

Help Received