Wind Power

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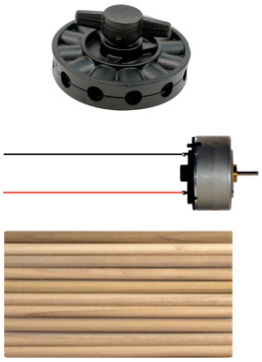
Objective:

Design blades for a wind turbine that produce the greatest voltage from a moving air mass.

Rules:

- A team may enter only one turbine. Any number of blades may be entered.
- Blades may be made out of any material. No turbine blades, propellers or other materials commercially designed as foils may be used. Blades are intended to be student-built. Wind tunnels or other structures intended to focus the moving air mass are not allowed.
- Students will design turbine blades that will be clamped into a standardized hub attached to standardized electric motor. Hubs and motors will be provided at the January meet. *
- The moving air mass will be created by a 24" box fan. The fan will be turned on the high setting.

Modification of Materials Provided:



- The dowels may be modified, but the hub and motor must remain in their original condition.
- Any configuration of blades (number, length, angle of attack) may be used as long as the teams use the standard hub and motor.
- The standard dc motor will be connected to a voltmeter for measurement. (Please take care to keep the motor leads intact so they can be connected to the voltmeter!)
- Motors will be mounted on a 1 m ring stand using a buret clamp. Teams may set the distance the turbine rests from the fan and the height, so long as they continue to use the provided stand and clamp.

The Trials:

- Teams will have two minutes in which they can prepare their turbine for trial. In this time, teams may fasten their turbine to the ring stand/buret clamp system and make adjustments to their turbine.
- Teams will have a total of one minute in which they may collect voltage data for their turbine. Teams may continue to adjust their turbine during this time.
- Teams will be ranked according to the greatest voltage attained, from most to least.
- The score recorded will be the best of the trials completed.

Additional Information:

Kidwind has a number of resources that may help you to understand wind energy and how to better harness it. http://www.kidwind.org/lessons/students.html

Please Note:

* Teams that do not attend the January meet may pick up the materials at Masconomet Regional High School or order their own materials at:
http://www.kidwind.org/xcart/product.php?productid=31&cat=71&page=1