Wind Turbine Blade Design Challenge

Objectives: As a result of this lesson, students will understand how the amount of generated electricity depends heavily on the design of the blades. Students will be able to design their own blades and experiment in order to find the optimal blade design for a wind turbine.

The blades on a wind turbine are meant to "catch" the wind and spin the generator to convert kinetic energy into mechanical energy and then into electric energy. The design of the blades determines the amount of wind that will be "caught." In this activity, students will design their own blades for the model turbine. Students use any materials to create the blades, attach them to dowels and the hub, and then test the efficiency of those blades by reading the voltmeter. This kit comes with a long version (3-class) and short version (1-class) lesson plan, extension activities, and student hand-outs. For the shorter version of this activity, students will test and analyze the included blade designs.

This kit includes:
Example blade designs
Wind turbine cross section
Hubs
Popsicle sticks
Dowels (1/4"X5")
Pennies
Scissors
Utility knives
Duct tape
Electrical tape
Glue guns and extra glue sticks
Elmer's Glue
Glue sticks
Rulers
Protractors
Alligator clips
Multimeter

Additional Equipment Needed:
PVC wind turbine
Fan

**See video with assembly instructions and tips at https://www.youtube.com/watch?v=mjsGrWioLlk*

*Any materials that are lost or broken during classroom use must be replenished before being returned. Wind turbine parts can be purchased from Vernier.