

Lift Weight and Produce Electricity with the Power of Wind



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today's theme



overview

- The materials contained in this kit allow students to investigate force, revolutions per minute, torque, work, power, circuits and energy.
- Using hands-on investigations, students will learn and discover how the design of blades affects performance and function, and how an alternator affects the electrical energy created by a wind lift and/or wind turbine.
- Today's kit is aligned to the current national standards as seen in your handouts



“all about the blades”

- Students will channel their inner-engineer and construct a balsawood windmill that produces the most power.
- Since everyone’s turbine will have the same structure, student’s creativity will be put to the test to create the windmill blades!
- How will YOU design the ideal blade for your windmill?



the science of windmills

- Betz's Law calculates maximum possible extractable energy from the wind.
- Different types of turbine blades can be created depending on the location of the windmill.



guiding questions...brainstorm!

- What do you think are some factors involved in a wind turbine that affect its performance?
- What are some aspects of a blade that may be changed in order to alter the performance of a wind turbine?
- What are some aspects of the design of a wind turbine that allow it to produce the most electrical energy?



workshop rules

- Construct your windmill structure according to the model provided, then design and construct your turbine blades.
- Turbines can have no fewer than **THREE** blades; no more than **FOUR**.
- Blades can only be constructed with the materials provided (**manila folders and tape**)
- Blades cannot be thicker than **one layer of manila folder**, no layering.
- Decide the angle at which your turbine will face the wind source, **BEFORE COMPETITION!**



competition

- Once your blades are finished, take your turbine to a competition station and connect your motor to the multimeter. Place your turbine at your desired angle, and measure power output.



contact information

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