



Science, Engineering and Technology

4-H Power of the Wind

North Dakota 4-H Project Sheet

Are you interested in wind turbines? How to save energy? How to power a cell phone with your own energy of motion? The Power of the Wind is designed for **middle school-aged youth**.



It involves them in the engineering design process to learn about the wind and its uses. Members will design, create, build and test wind-powered devices and explore wind as a potential energy source in their community.

Here's what you can do all year!

Challenge Activities

- Design and engineer a paper sailboat.
- Design and build a wind turbine that lifts a load.
- Design and build two wind turbines, one with high solidity and one with low solidity.
- Design and build a wind turbine that uses wind power to create electricity.
- Design and engineer a wind-powered machine, vehicle or sculpture.

Exploration Activities

- Create a tetraflexagon for gauging wind speed.
- Observe and measure wind speed.
- Read and interpret wind maps and charts.
- Research wind farm facts.
- Evaluate successful school wind projects.
- Communicate the influences of wind and wind machines on daily life using art and literature.

Investigation Activities

- Investigate how wind energy is transferred to a pinwheel.
- Redesign pinwheels to observe changes in performance.
- Investigate how motors and generators work.

Pass it on!
Now that you know how, share it with others. Here are ideas to get you started.

Communication

- Organize a debate on the pros and cons of a wind energy issue.
- Demonstrate your wind energy creation.
- Present a speech and/or illustrated talk about a wind energy topic.
- Write a children's book for your CloverBud group to explain the work of one of the early electrical pioneers.

Citizenship

- Compose a news article for your local paper that would help community members learn about wind power.
- Explore how wind energy has affected rural communities.

Leadership

- Teach the "Wired for Wind" national science experiment.
- Conduct a wind fair with other members in your club to showcase your wind projects.
- Teach one of the Power of Wind lessons.

Entrepreneurship

- Create a career guide for alternative-energy careers.
- Job shadow a wind-energy professional in your community.

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Here are other power of the wind opportunities to explore:

- Tour the Lake Region State College wind technology program.
- Visit with a meteorologist to learn more about wind.
- Tour LM Wind Power (a wind turbine blade manufacturer) in Grand Forks.
- Tour a wind turbine site.



Exhibit Ideas

Create a poster, notebook or display of a Power of the Wind project. Some specific ideas are:

- Make a brochure of different careers required to build a wind farm. Include descriptions of careers, technologies they used, educational requirements and other interesting facts you think are important.
- Demonstrate a wind-powered vehicle, machine or sculpture or other item you've designed, built and tested.
- Create a wind-powered piece of art work (something that might move or change in the breeze.)
- Create a scale model of a wind farm.
- Create a wind poster that exemplifies one of the lessons learned in the Power of Wind project.
- Develop a pinwheel display that demonstrates the working power of the wind. (Follow guidelines on Pages 18 and 19 of the manual.) The display should include a notebook description of the effectiveness of at least three different designs or materials with and without rotational symmetry.
- Create a wind as energy display. This should be the 4-H'er's original design. Include a notebook of why the item was designed and how it harnesses the power of the wind.
- Create a photo journal of wind turbines and wind-related projects in your state and/or surrounding states.

4-H Resources

- National 4-H Curriculum:
- [Power of the Wind Youth Guide \(DC101\)](#)
 - [Helper's Guide \(DC201\)](#)
 - [National 4-H Power of the Wind – Grab and Go Lesson Downloads](#)
 - [Educational Trunk:](#)
 - Wired for Wind Trunk (Reserve through your county Extension office)

Other Resources

- [Kidwind](#)
- [NDSU Energy](#)
- [American Wind Energy Association](#)

Recordkeeping

- [Planning for My Project Adventure](#) (PA093) (Ages 8-10)
- [4-H Project Plan](#) (PA095)
- [4-H Plan of Action](#) (PA096) (Ages 11-18)
- [ND 4-H Participation Summary for 11 to 19 year olds](#) (PA098)

Learn more at www.ndsu.edu/4h or contact your county NDSU Extension office.