

Exploring Wind Energy

Topic: Wind is a renewable resource.

Suggested grades 3 – 5

Target standards - Grade 4

Materials/Resources needed:

- Student Activity Sheet
- New pencils with erasers
- 0.25 inch straight pins or brads
- Construction paper
- Scissors
- White paper
- Old magazines
- Glue
- Poster of a wind turbine
- Stapler

Prep time: 15 minutes

Lesson time: 10 minutes

Teacher-guided templates: 1 hour

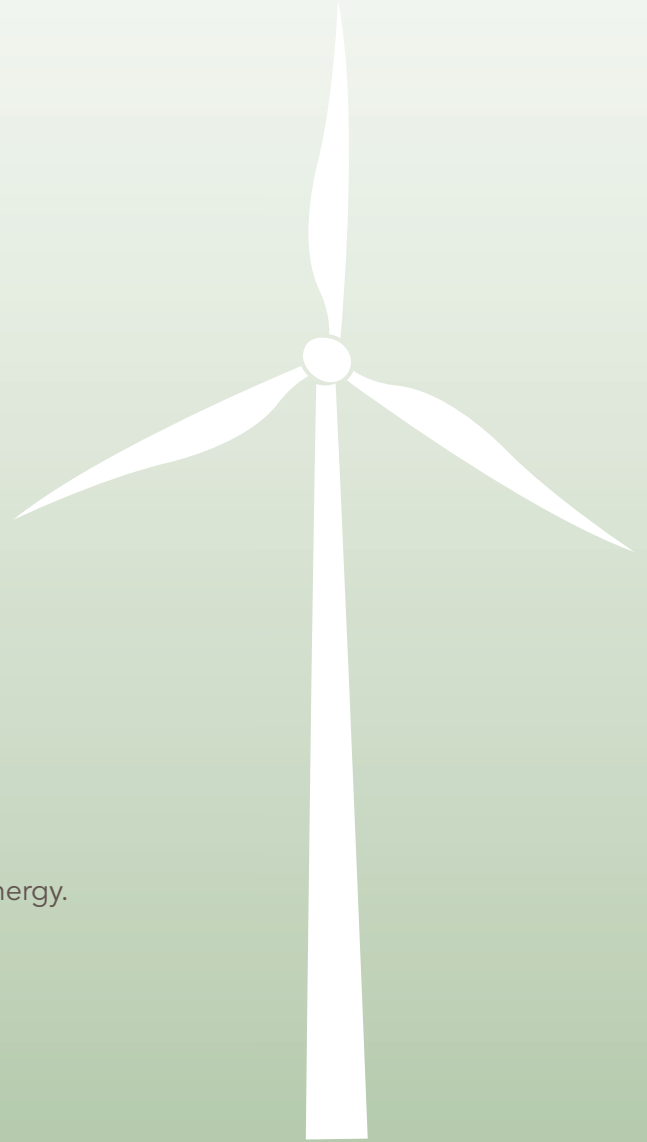
Outcome: Students will be able to discuss that wind is energy.

Standards:

In appendix

Vocabulary:

In appendix



Prep



- Make craft items available at a separate, common table.
- Have a sample pinwheel available for demonstration.
- For free downloadable posters, visit <https://practicalaction.org/posters-wind-turbine>.

Engage



- Have a student volunteer blow a small object across a table.
- Ask the students what kind of energy (wind) provided the work (movement).

Teach/Build/Activity



- Ask students how else does wind perform work.
 - Write/draw the responses on the board.
- Have students work in groups and peruse magazines with the instruction of cutting out photos of wind at work.
 - Have work groups glue the images on a sheet of paper.
 - Have each group display their collage and share their findings.
- Demonstrate the pinwheel and discuss how the pinwheel is like a wind turbine.
 - Refer to wind turbine model poster.
 - Explain that when the blades go around, the turbine makes electricity which provides power.
 - Explain that wind energy is a renewable resource.

Explore/Engineer



- Assist students in making pinwheels.
 - Cut along the diagonal lines of the square toward the center.
 - Bring each corner of the paper to the center and push a pin through all four corners and the center of the paper. You may want to staple through all layers before inserting pin.
 - Push the pin into the rubber eraser at the end of the pencil.
 - Encourage students to take home the pinwheels and talk to their family about renewable energy.

Assessment

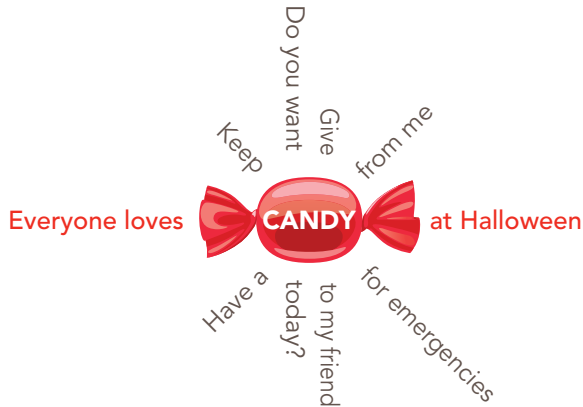


Students apply their learning in creating a pinwheel and using the correct terminology to discuss wind energy.

Crossover



- Have students write a poem about wind energy using a pinwheel pattern. Write five, five word sentences about wind. The middle word should be shared by each sentence. (see sample of pinwheel poem).



- Have students write a short story or comic book panel with the wind as the major character.

Accommodations and Extensions



- Use the pinwheel activity during family science night and have parents help.
- Have students design and color pinwheels for specific holidays.

Anticipated Misconceptions



Students may think that the wind blows all of the time.

Safety



Supervision may be needed when using a sharp object like pins.

Front Loading



Read one or more of the following books:

When the Wind Stops by Charlotte Zolotow

Willa and the Wind by Janice M. Del Negro

The Wind Blew by Pat Hutchins

One Leaf Rides the Wind by Celeste Mannis

Mirandy and Brother Wind by Patricia McKissack

Wind Child by Shirley Rousseau Murphy

Comes a Wind by Linda Arms White

Wind and People by Nicki Bundley

Wind Power by Josepha Sherman

References



PBS NOW with Bill Moyers Wind documentary serves as a tutorial for teachers
pbs.org/now/classroom/wind.html

KidWind Project

kidwind.org

American Wind Energy Association

awea.org

Additional References and Digital



Watch a flash movie to see how wind turbines work

How a turbine works

youtube.com/watch?v=A_jnkMpEFz4

Wind speed calculations

youtube.com/watch?v=VehitPvKKhk

Wind energy for kids

youtube.com/watch?v=niZ_cvu9Fts



Appendix

Standards

4-PS3 Energy

Students who demonstrate understanding can:

4-PS3-4 Apply scientific ideas to design, test and refine a device that converts energy from one form to another.

Common Core State Standard Connection

- Mathematical practices.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Vocabulary

Energy – The capacity to do work.

Turbine – An engine moved by a fluid such as steam, water or air.

Wind – Moving air.

Work – Energy in motion.