Build a Wind Turbine

Re-Energy
Activity
Grade Level 3-12

Main Objective

Studying wind turbines is a great way to learn about renewable energy generation. In this construction activity, learners will build a working wind turbine model and then compare the amount of electricity produced by high and low wind speeds. Learners will also evaluate their wind turbine design and answer questions about wind energy.

Learning Outcomes

By the end of this activity, learners will:

- Record the amount of voltage produced by varying wind speeds.
- Evaluate the wind turbine design.

Length of Activity: 2 hours (2 Class Periods)

Period 1: Building a wind turbine (1 hour)
Period 2: Testing the energy production of different wind speeds (1 hour)

Materials List

- Internet-enabled device
- Wind Turbine Construction Plan
- Wind Turbine Learner Worksheet
- Materials to build the Vertical Axis Wind Turbine (One turbine for every four learners) as outlined in the Construction Plan
- One voltmeter for each group
- One fan or blow dryer for each group

Copyright © 2026 GreenLearning Canada Foundation.
All Rights Reserved.

Activity

Period 1: Building a Wind Turbine

Step 1: Read the Construction Plan

1. Go through the "Wind Turbine Construction Plan" as a class together and watch the video below to provide leaners an overview of the model they will be building.

How to Build a Wind Turbine! (6:50 minutes)

Step 2: Build It!

1. Divide the learners into groups of four. Assign them to a building centre. Distribute the magnets only when a group reaches the stage at which they are required (the magnets are very strong and can easily be broken or become stuck to metal objects).
2. Once the learners have completed their models, have them try to blow on the turbine to illuminate the light.

Period 2: Testing the Energy Production of Different Wind Speeds

Step 1: Introduction

1. Explain to the learners that they will be using their wind turbine model to test different wind speeds and record the amount of electricity produced.

Step 2: Testing the Wind Turbines

1. Demonstrate the methods for connecting the voltmeter to the wind turbine. Ask learners to apply two different speeds using a hair dryer or fan, or by blowing, and to record the voltage at each wind speed.
2. When the learners are finished testing their wind turbines, have them complete the questions on the worksheet.

Copyright © 2026 GreenLearning Canada Foundation.
All Rights Reserved.

Tips and Extension Activities

- There is a possibility of the learner's turbines not working. Have a couple of extra demonstration models available so that the learners can successfully test them.
- Ask the learners how much wind energy is available in their region. Have learners use an anemometer to measure wind speeds. Discuss whether it would be possible to use wind energy as a reliable renewable energy resource in the area.
- Have learners use weather reports and the Beaufort wind scale to collect information about wind velocity and wind direction.

Comprehension

- What is the difference between a renewable and non-renewable resource?
- How does the wind turbine model generate electricity?
- Which type of wind turbine was built in class – a horizontal axis or a vertical axis turbine?
- How can wind speed affect the amount of energy produced?
- What are the benefits of using wind energy as opposed to fossil fuel-based energy?
- How was wind energy used in the past? How is it used in the present?

Copyright © 2026 GreenLearning Canada Foundation.
All Rights Reserved.

Answer Key to Worksheet

1. Which wind speed produces the largest amount of electricity – the lower speed or the higher speed? The higher the wind speed the more volts will be produced.
2. What changes would you make to the design to improve the efficiency? This will depend on the learner.
3. What adjustments did your group have to make so that the wind turbine would run smoothly? Learners will find that lining up the rotor with the magnets so that it will skim over the copper coils is challenging. It may take a few tries for the turbine to rotate smoothly. Gluing the parts so they are straight may also be challenging.
4. Describe how wind is made. The sun plays an important part in creating surface wind. Winds above the continents and oceans occur because of different temperatures around the world. The equator has more direct sunlight and the air is warmer than in areas close to the poles. Warm air rises and cooler air from surrounding areas fills the space left by the rising warm air, thus creating surface wind.
5. List some ways that wind power has been used in the past. Wind energy was used for sailing ships. The wind energy provided sailors with efficient power for transportation. Wind energy has also been used to pump water and to turn a mill to grind grain into flour.
6. List some ways that wind power is used today. Wind is used to pump water on farms, much like in the past. It is also used to generate electricity for our homes, schools and businesses. Today we can connect the electricity we generate directly to the electrical grid.
7. What are the benefits of using wind energy as a renewable energy resource? Wind energy is a non-polluting source of energy. Farmland that has wind turbines may also be used for farming purposes. The environmental impact on land is small in comparison to that of coal mining.

Copyright © 2026 GreenLearning Canada Foundation.
All Rights Reserved.