

# Exploring Energy Conversions with Wind Power

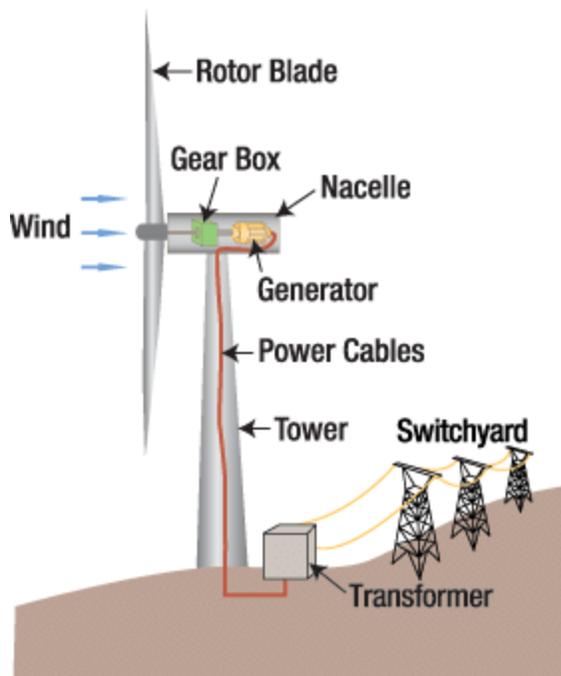
Name \_\_\_\_\_

**Problem:** Globally, environmental concerns, including climate change, are challenging people to examine and search for new energy sources. Wind power is a potential source. Write down three questions that interest you as you watch the video.

- 1.
- 2.
- 3.

## **Background:**

Below is a picture of a wind turbine. Explain the energy conversions you see in this picture. Add more steps if you want to/can.



1. Wind energy is converted into \_\_\_\_\_
2. \_\_\_\_\_ energy converts to \_\_\_\_\_
3. \_\_\_\_\_ energy converts to \_\_\_\_\_

## **Design and Build**

1. Look at the materials available. Sketch how you think you can make the best wind turbine with those materials.

2. Now create the wind turbine. Be sure to check with your instructor before attaching anything permanently. Keep experimenting with your materials until you have something attached to your generator that will spin when placed in front of a fan.
  
3. Once your wind turbine seems to be working, use a multimeter to measure the voltage being produced by your wind turbine.  
Voltage: \_\_\_\_\_
  
4. Try a couple of different designs to see what works best. What is the best voltage you can get?  
Voltage \_\_\_\_\_
  
5. Sketch your wind turbine below and explain what you learned during the building process about what is necessary to create a working wind turbine. Make sure to explain any differences from your original sketch.

**Comparisons:**

Have each group share how they created their wind turbine and the features that make it successful.

	# Blades	Blade shape/size	Fan Speed	Voltage
Group 1				
Group 2				
Group 3				
Group 4				
Group 5				
Group 6				
Group 7				
Group 8				
Group 9				
Group 10				

Although there are many variables tested above, decide what you think the best answer is to each question below.

5. What number of blades produced the most electricity?
6. What fan speed produced the most electricity?
7. What is the best size and shape for making blades?
8. Together as a class, build one or two wind turbines with the answers to questions 5-7. Did either of these wind turbines outperform all of the original designs?
9. Look back at your three questions from the intro video. Can you answer at least one of them now? Please do so here.

10. Scientists accept a law that says energy is converted from one form to another.

What **claim** can you make about the conversion of energy?

What **evidence** do you have to support it?

What **reasoning** did you use?