In this lab, you’ll isolate one variable of your blade’s design, experiment with it, and use what you learned to make your turbine even better!

**Lab Supplies**

- **“Built” Mini Wind Turbine**
  - Need to build your turbine? Download the Go Guide at [shop4-h.org](http://shop4-h.org)
- **Blade Materials**
  - Cardboard, recycling bin materials, tape, etc.
- **Fan**
- **Scissors**
- **Digital Multimeter** or Voltmeter
- **4x Alligator Clip Leads**
  - optional – for connecting the multimeter
- **2.7 Ω Resistor**
  - optional – smooths voltage readings
Ask A Question

1. Choose a variable to investigate:

**Blade Angle**

Blade angle is the most important variable, and it’s also the easiest to change! **Try angles between 0° and 90°.** Use a protractor to measure your angles.

**Blade Length**

Each blade acts like a lever turning your generator. **What works better for speed – long or short blades/levers?** Test different lengths to find out!

**Blade Width**

Wider blades catch more wind, but also have more friction. **What width works the best?** Design an experiment to find out!

**Other Variables**

Blade shape, blade materials, number of blades, … the possibilities are endless! **What variable will you investigate?**

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If doing this lab for school, make sure your teacher approves the variable you are testing.
2. What variables do you need to keep track of?

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<thead>
<tr>
<th>Independent Variable(s)</th>
<th>Dependent Variable(s)</th>
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3. Write a plan for your experiment, including a sketch of the setup. Make sure you provide enough information for others to repeat your experiment.

Plan:

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Sketch:
Collect Data

4 Do your experiment! Record your data on these pages in lists or tables. Then graph it to look for patterns.

Need help setting up for testing?
See Page 4 of the Go Guide, available at shop4-h.org
Collect Data (continued)
Interpret Data

5 Examine your graphs and tables. How are the independent and dependent variables related (e.g. proportional, linear, exponential, inverse, ...)? How do you know?

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Construct an Explanation

6 What do you think is going on? Why did you observe what you did?

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7 What did you learn, and how will you use it to make a better turbine?

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