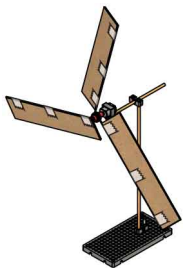


In this lab, you'll isolate one variable of your blade's design, experiment with it, and use what you learned to make your turbine even better!



Lab Supplies



"Built" Mini Wind Turbine

Need to build your turbine?

Download the [Go Guide](https://www.teachergeek.com/go-guide) at [teachergeek.com/miniwind](https://www.teachergeek.com/miniwind)



Fan



Scissors



Blade Materials

Cardboard, recycling bin materials, tape, etc.



Digital Multimeter
or Voltmeter



4x Alligator Clip Leads
optional – for connecting the multimeter

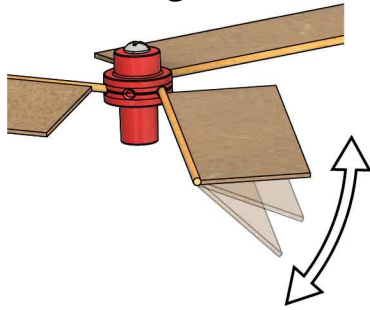


2.7 Ω Resistor
optional – smooths voltage readings

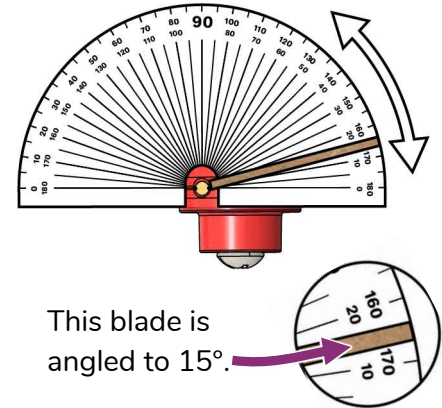
Ask A Question

① Choose a variable to investigate:

Blade Angle

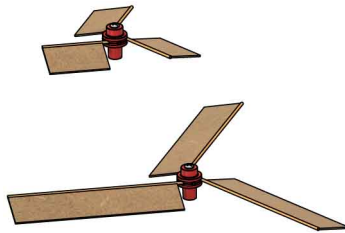


Blade angle is the most important variable, and it's also the easiest to change! **Try angles between 0° and 90°.** Use a protractor to measure your angles.

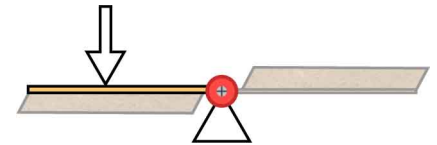


This blade is angled to 15°.

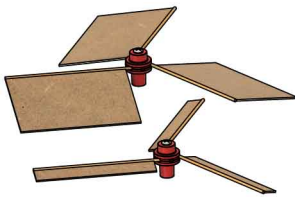
Blade Length



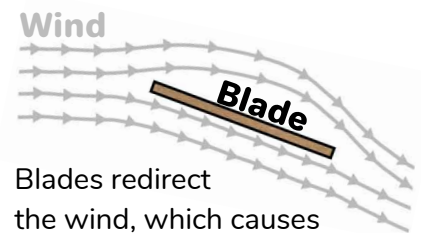
Each blade acts like a lever turning your generator. **What works better for speed – long or short blades/levers?** Test different lengths to find out!



Blade Width

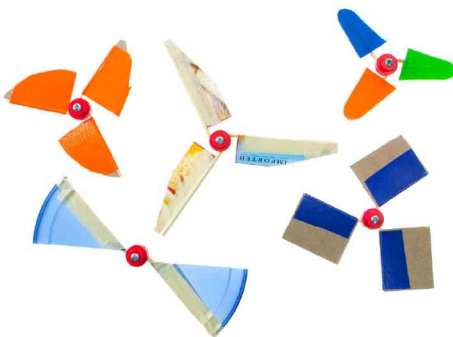


Wider blades catch more wind, but also have more friction. **What width works the best?** Design an experiment to find out!



Blades redirect the wind, which causes them to spin.

Other Variables



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



If doing this lab for school, make sure your teacher approves the variable you are testing.

Plan Your Experiment

2 What variables do you need to keep track of?

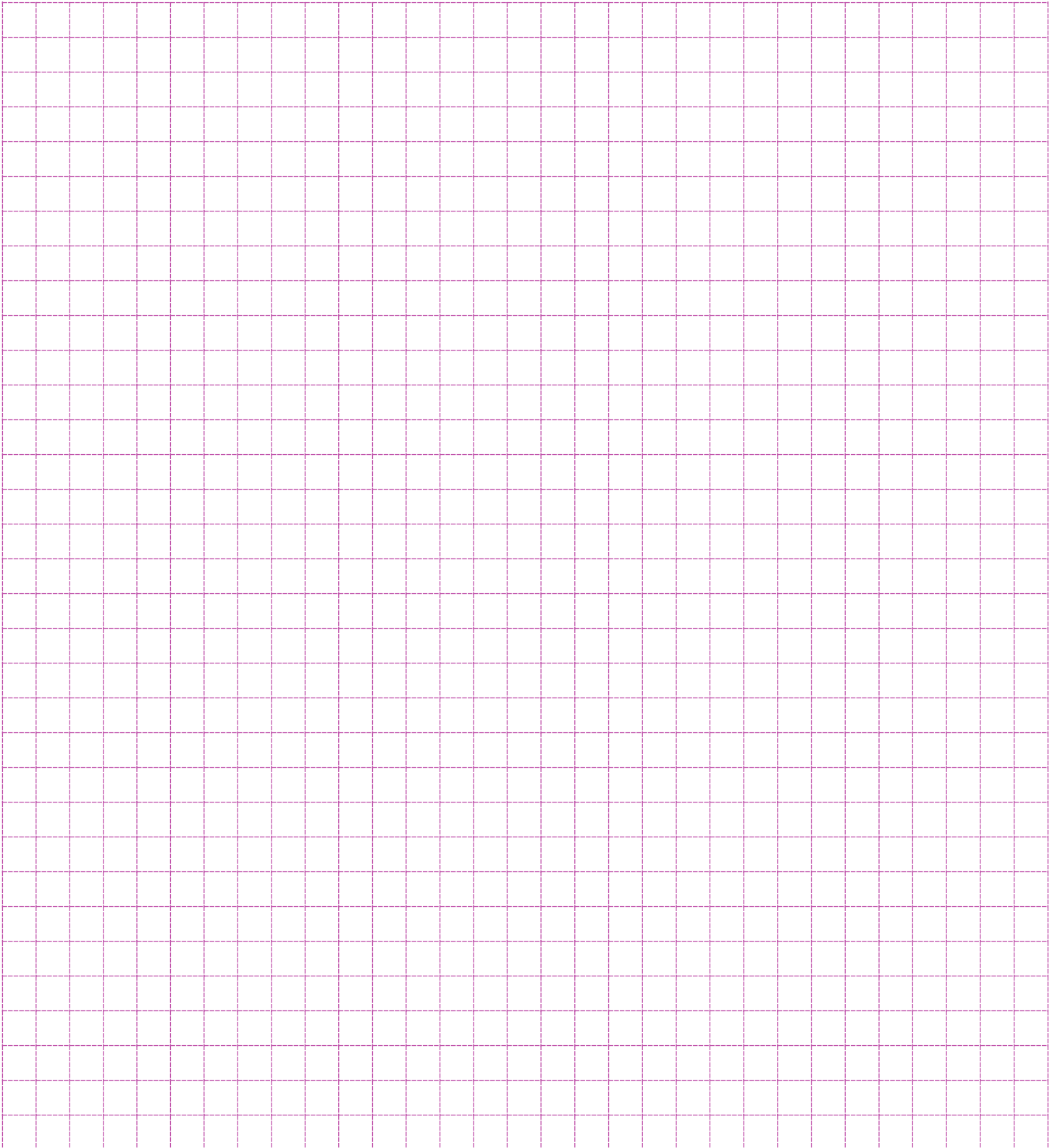
Independent Variable(s)	Dependent Variable(s)	Control Variable(s)

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:

Sketch:

Collect Data (continued)

A large, empty grid of small squares, intended for students to record their experimental data. The grid consists of approximately 30 columns and 40 rows of squares.

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?

Construct an Explanation

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

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