Propeller Design Lab

Build-a-Boat

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

Lab Supplies

"Built" Boat

Need to build your boat?

Download the Go Guide at shop4-h.org

Fan

Scissors

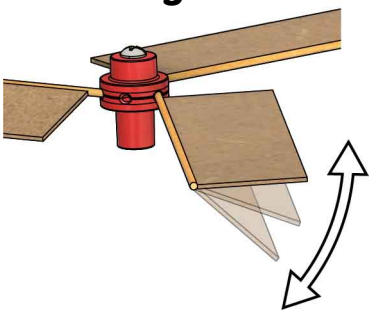
Blade Materials

Cardboard, recycling bin materials, tape, etc.

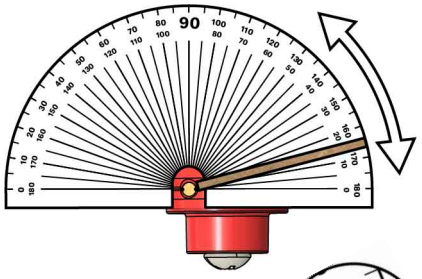
Ask A Question

1 Choose a variable to investigate:

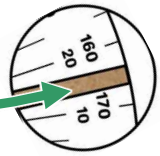
Blade Angle



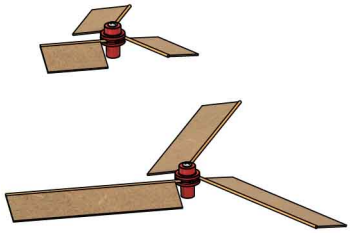
Blade angle is the most important variable, and it's also the easiest to change! **Try angles between 0° and 90°. Use a protractor to measure your angles.**



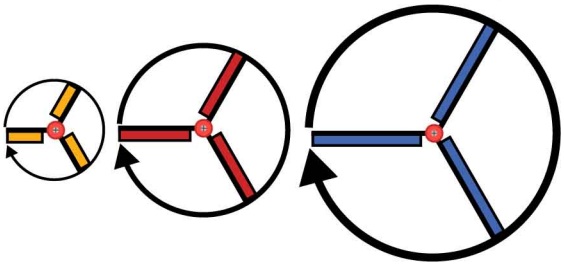
This blade is angled to 15°.



Blade Length

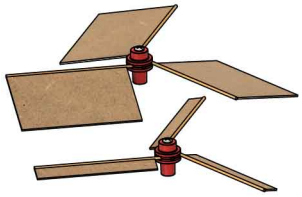


Longer blades move faster than shorter blades, if your motor is strong enough to push them. **Test different lengths to see which works the best!**

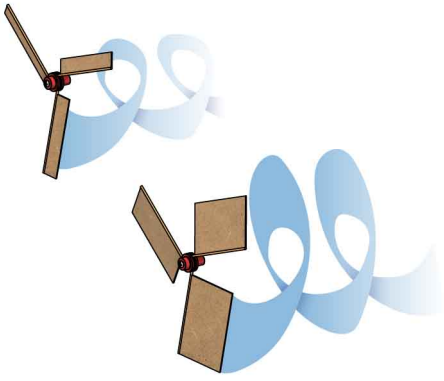


If the motor spins each propeller 50 rotations per minute, the big blades go a greater distance, so they must move faster.

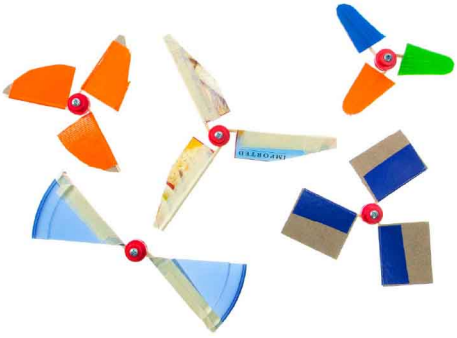
Blade Width



Wider blades push more air by taking bigger "bites," but they also have more friction with the air. **What width works the best?**



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

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

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?

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 propeller?