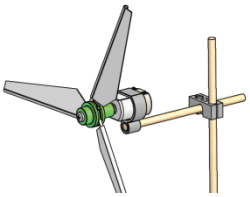
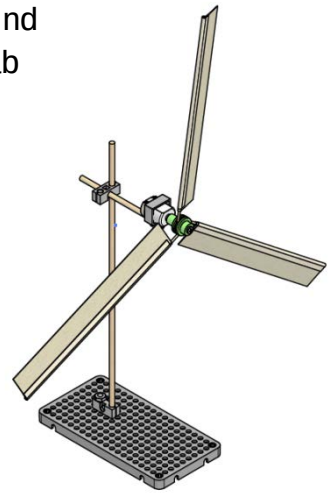


MINI WIND TURBINE - BASIC BUILD

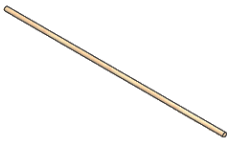
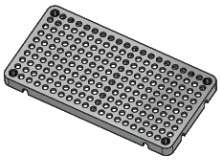
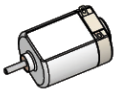
Name: _____ Set: _____ Date: _____

This guide will take you through the process of creating a basic mini wind turbine. After you finish the lab you can proceed to the mini turbine lab where you will test, experiment and engineer rotor designs.



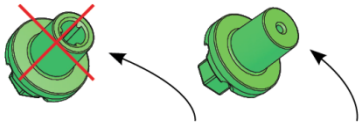
For use with TeacherGeek Mini Turbine Kits: 1823-12 or 1823-13

Materials Required - From the Kit

 Perpendicular Block Quantity: 2	 300mm (~12in) Dowel Quantity: 2	 Hole Plate Quantity: 1	 5/8 Screw, #10 Quantity: 1
 5/8 Screw, #6 Quantity: 1	 Mini Hub Cover Quantity: 1	 Mini Hub Base, Motor Mount Quantity: 1	 Nut, #10 Quantity: 1
 1.5V Motor Quantity: 1	 Mini Motor Mount Quantity: 1	 150mm (10in) Skewers Quantity: 10	

Materials Required - Not in the Kit

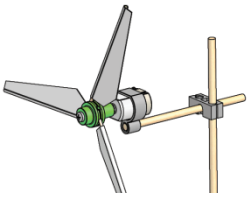
 Tape	 Material for Blades (cardboard, chipboard, posterboard)



Note: Mini Hubs come as dowel mount or motor mount. This activity requires a mini hub motor mount.

Tools & Supplies Required - Not in the Kit, Available at TeacherGeek.com

 Cutter	 Screwdriver	 Optional: Pliers



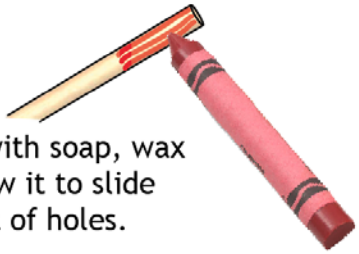
MINI WIND TURBINE - BASIC BUILD

Wear safety glasses when building and testing your turbine.

Construction:

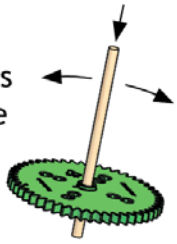
Dowels and Strips can be cut with a multi-cutter (best method), saw, side cutters or pruning shears. Wear safety glasses when cutting.

Multi-Cutters



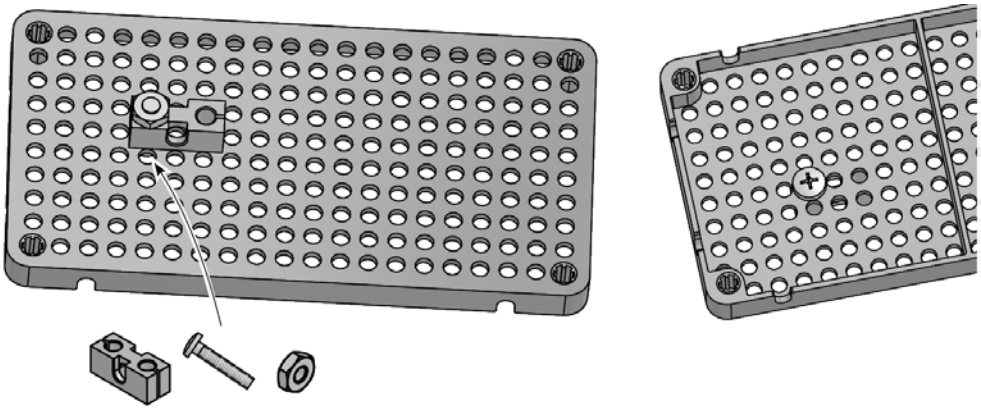
Tip: Rub a dowel with soap, wax or a crayon to allow it to slide easier into and out of holes.

Push dowels into holes by:
1. Wiggling and pressing with your hands
2. Tapping dowels with a hammer or the side of your cutter.



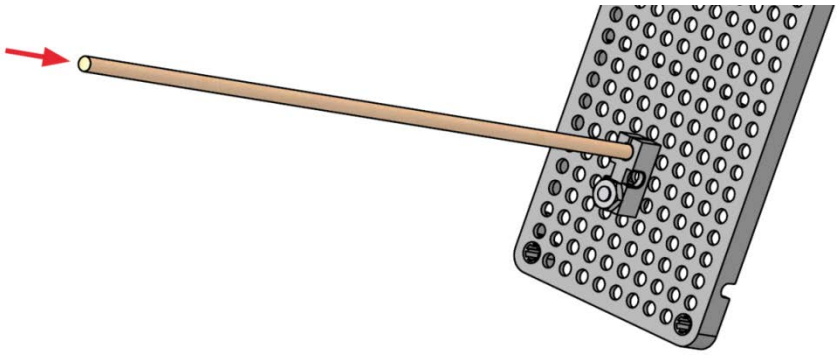
Step #1

Mount a block to the plate using a #10 screw and nut. Tighten the screw to keep the block from rotating.



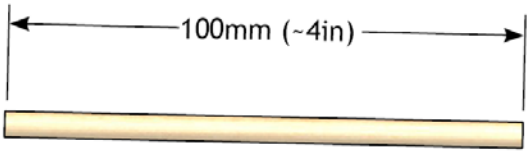
Step #2

Place an uncut 300mm (12in) dowel into the perpendicular block. The dowel will become the turbine tower.



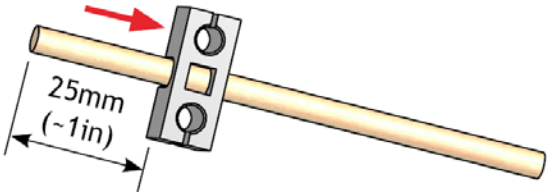
Step #3

Cut a 100mm (4in) dowel.



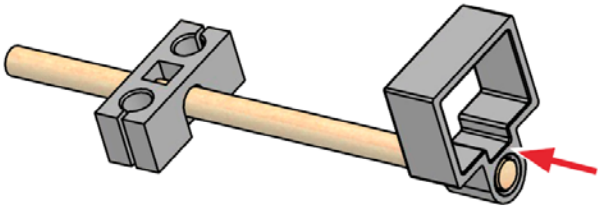
Step #4

Tap a perpendicular block onto the 100mm (4in) dowel as shown.



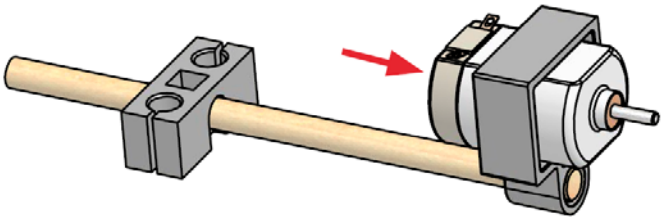
Step #5

Push a mini motor mount onto the assembly from Step C.



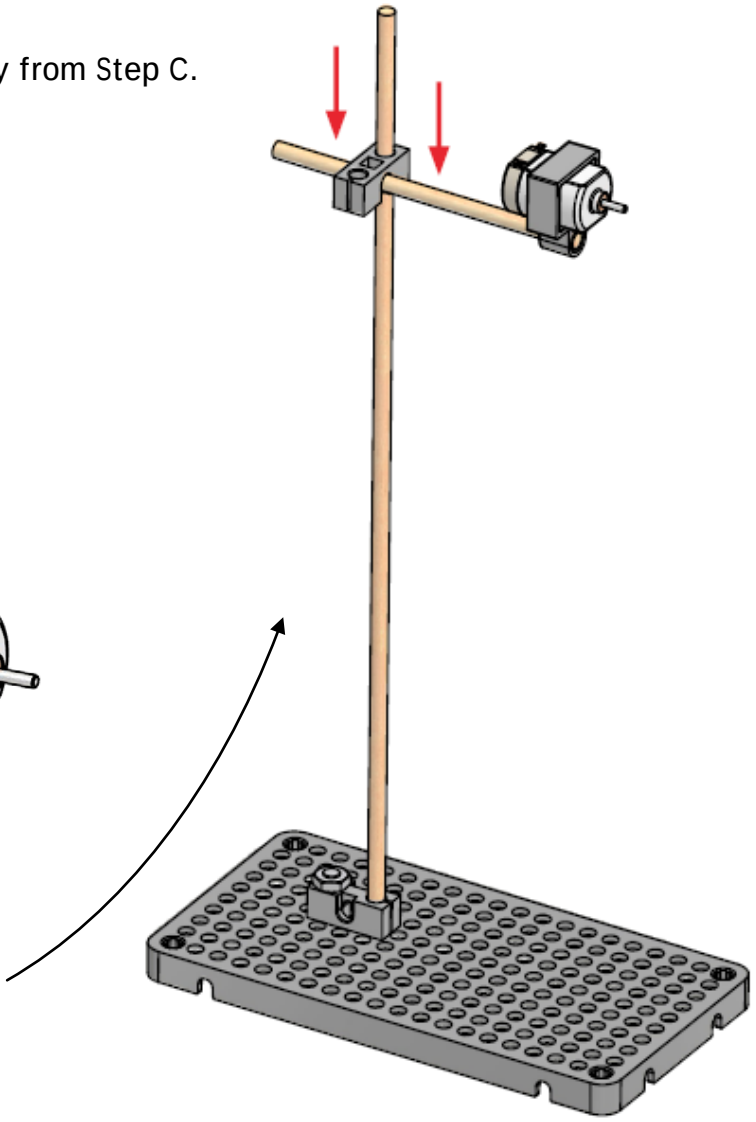
Step #6

Place the motor into the mount.



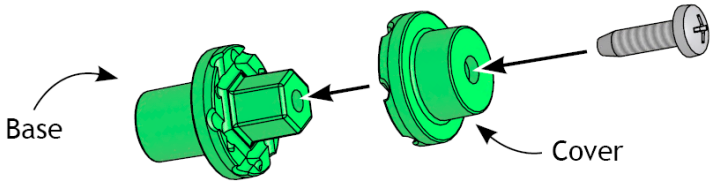
Step #7

Slide the motor bracket from Step 5 onto the turbine tower dowel.



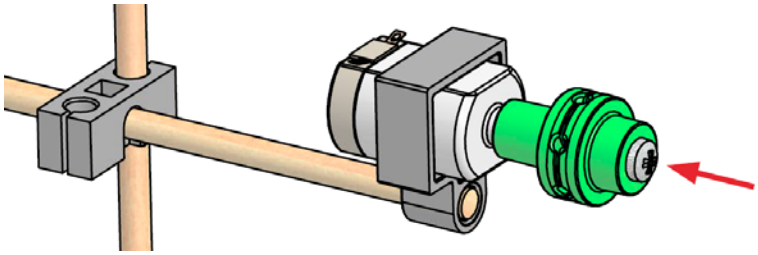
Step #8

Attach the mini hub cover to the base using a #6 screw. Keep the screw slightly loose.
Tip: Hold the base with pliers when turning in the screw.



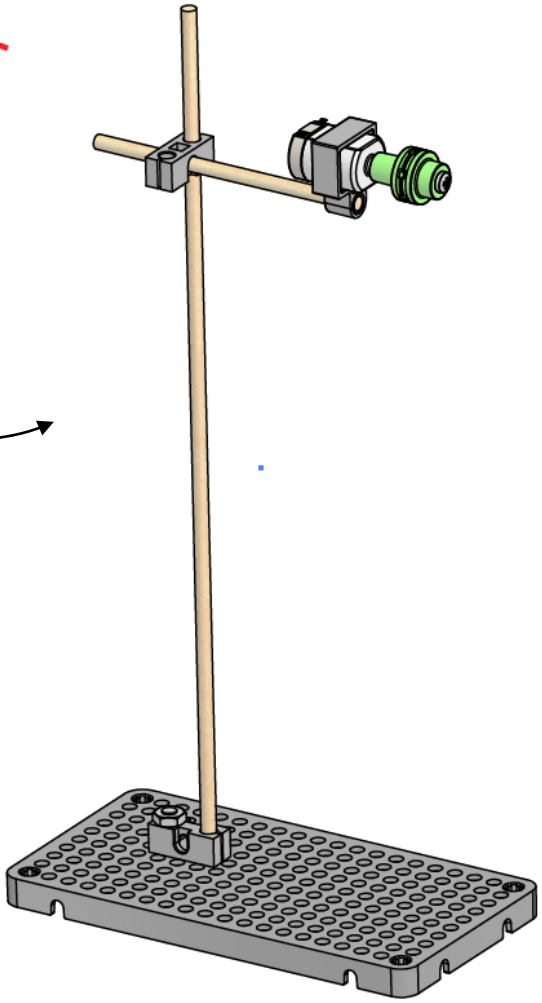
Step #9

Press the mini hub onto the motor shaft.



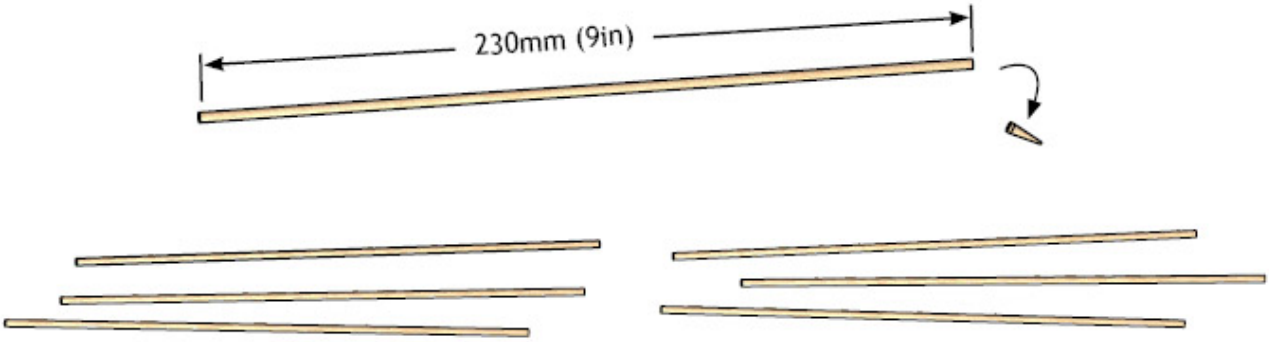
Your Turbine Stand is finished!

It is time to make a rotor.



Step #10

Cut 10 skewer sticks to 230mm (9in), while cutting the points off.



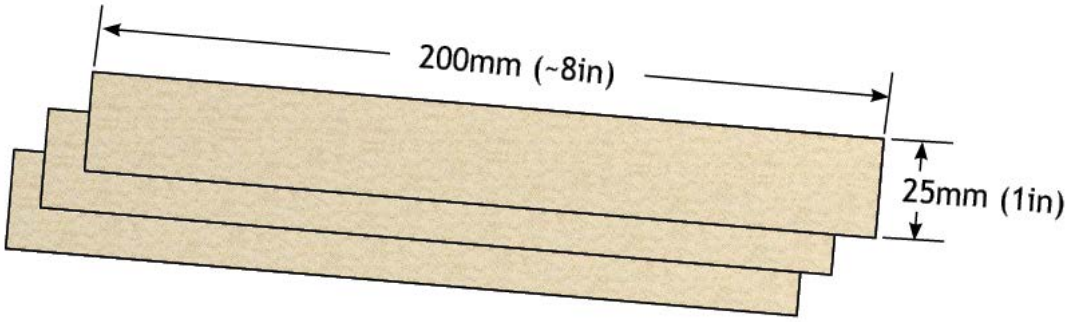
Note: You will only use 3 of the 10 cut stick to create your first turbine rotor. The other sticks will be used later to create your own unique turbine blades.

Gather Supplies for Blades:

You will need tape, and material for your blades (cardboard, poster board, chipboard, or other materials). Blade material is not supplied in the kit.

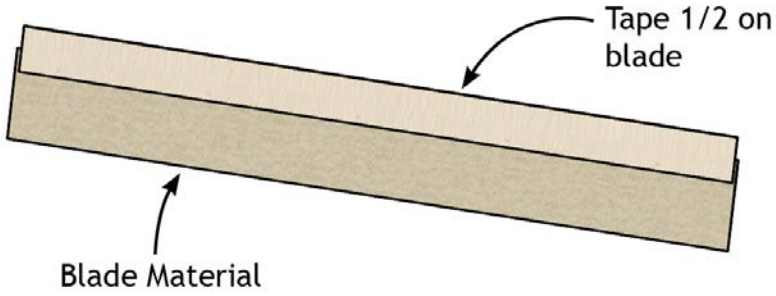
Step #11

Cut 3 large rectangular blades from the material you selected.



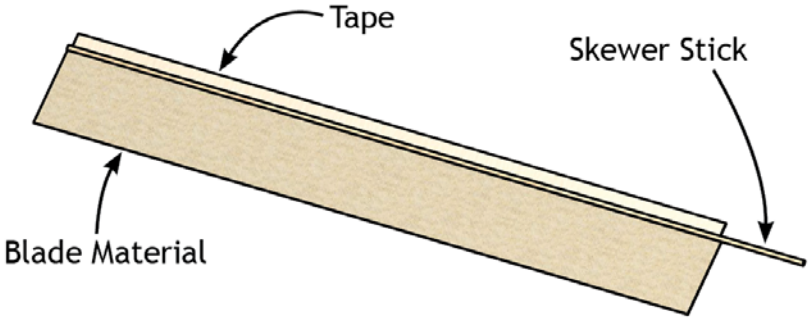
Step #12

For the 3 blades, place a piece of tape half way over the edge of the blade material, as shown.



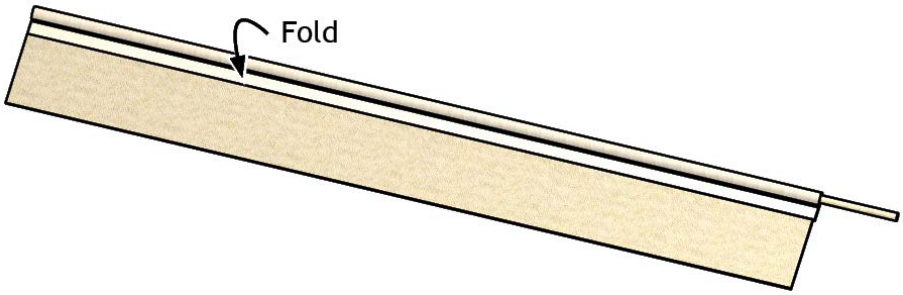
Step #13

Flip over the blades from Step #12 so the tape is sticky side up. Place cut skewer sticks on the tape so they touch the edge of the blades.

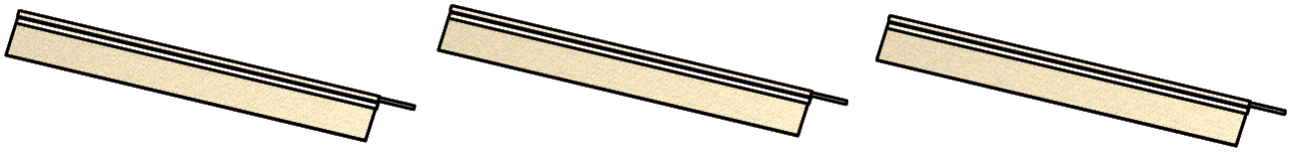


Step #14

Fold the tape and skewer sticks over onto the blades. Press and adhere the tape. Additional tape can be used to keep the sticks tight to the blade.

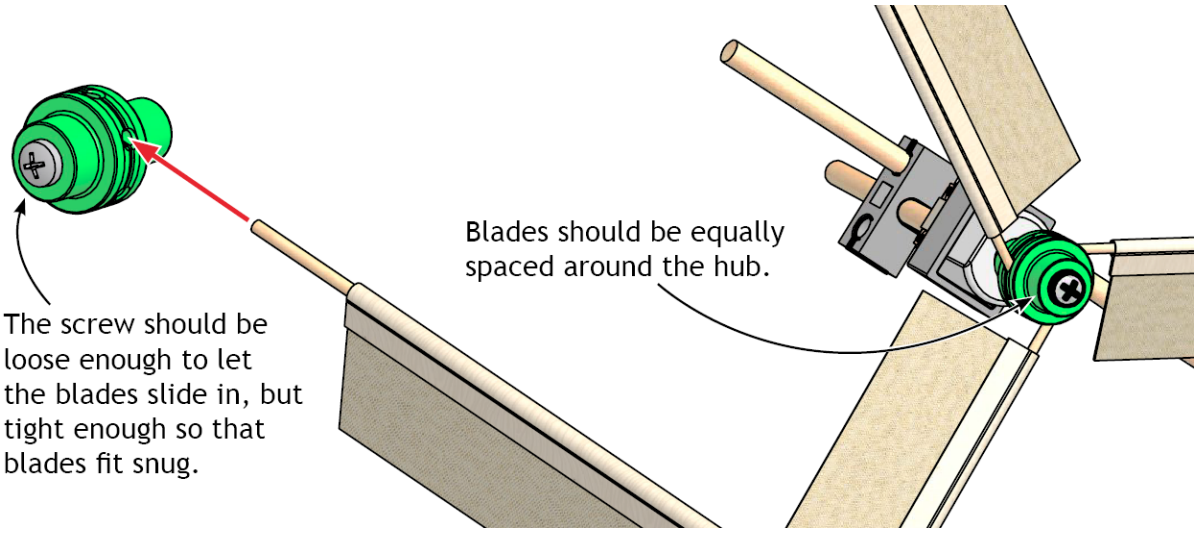


You should now have 3 rectangular blades:



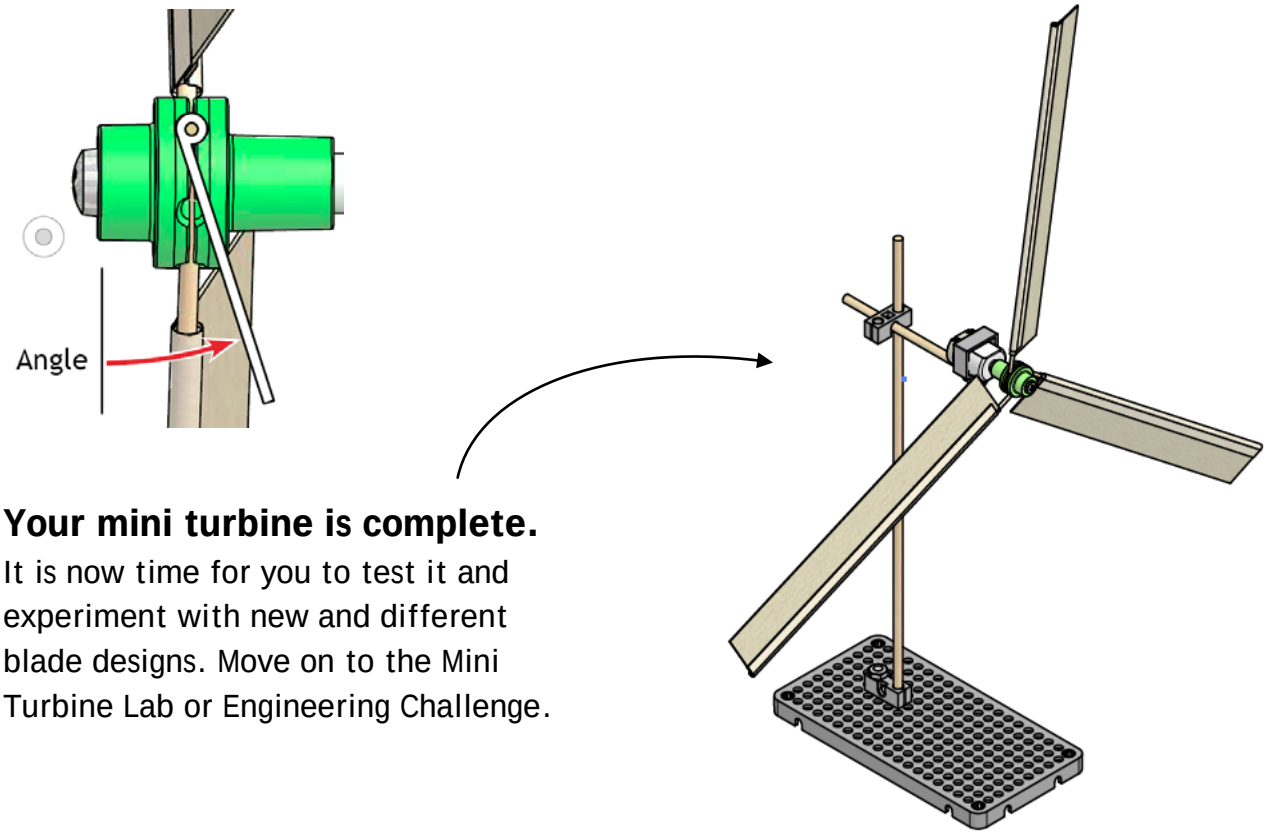
Step #15

Insert the three blades into the hub.



Step #16

Adjust all 3 blades to the same angle. Tighten the hub screw to keep the blade angles from changing.



Your mini turbine is complete.

It is now time for you to test it and experiment with new and different blade designs. Move on to the Mini Turbine Lab or Engineering Challenge.