



Mini Wind Turbine Build



Wind is an *AMAZING* energy source!
Harness the power of wind.

This guide will help you create
your own mini wind turbine.

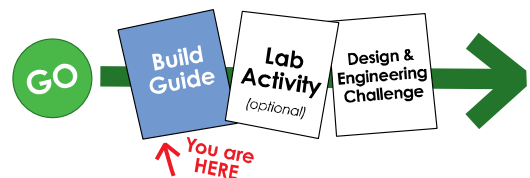
CLASSROOM COPY

Save Paper, Share in Groups



THINKING AHEAD

What happens when you
change the shape, size
or type of blades?





Mini Wind Turbine Build



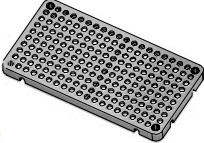







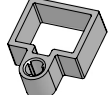


TeacherGeek Components

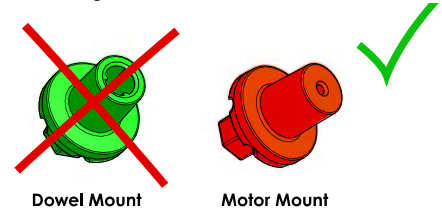
For One
Wind Turbine

Below is the list of "ingredients" you'll need for each mini wind turbine.

Available as single: SKU 1823-12 or 10 pack: SKU 1823-13. Both include extra parts for your own innovative creations!

- | | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| x2 | x2 | x1 | x1 | x1 | x1 |
| Perpendicular
Blocks | 300mm (12')
Dowels | Hole Plate | 5/8" or 1"
#10 Screw | 5/8" #6
Screw | #10 Nut |
|  |  |  |  |  | |
| x1 | x1 | x10 | x1 | x1 | |
| Mini Hub
Cover | Mini Hub
Base | 150mm (10')
Skewers | 1.5V Motor | Mini Motor
Mount | |

Double Check Your Supplies!
This activity needs motor mounts.



TeacherGeek Tools You'll Need

Easy to Share
in Groups

Perfect for sharing in groups of 3 and 4!

Time to break out those tools and start building! Available at teachergeek.com



Multi-Cutter
SKU 1823-81



Screwdriver
SKU 1823-90



Pliers
SKU 1823-86

Materials You Supply

Go on your own scavenger hunt to find these items. Try creating with all kinds of things!



Tape



Recycling Materials
(for blades)



Safety Goggles

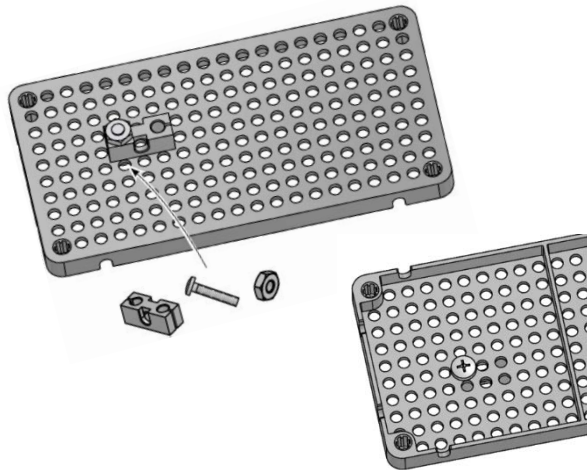


Mini Wind Turbine Build



Let's Get Started

- 1 Attach one **perpendicular block** to the **hole plate** using a **#10 screws** and **#10 nuts**.

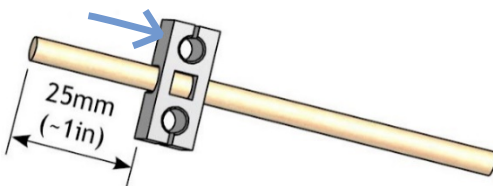
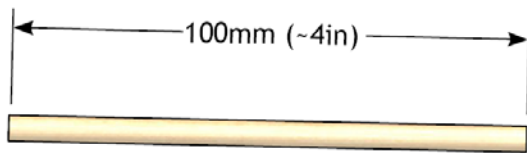


Bottom View

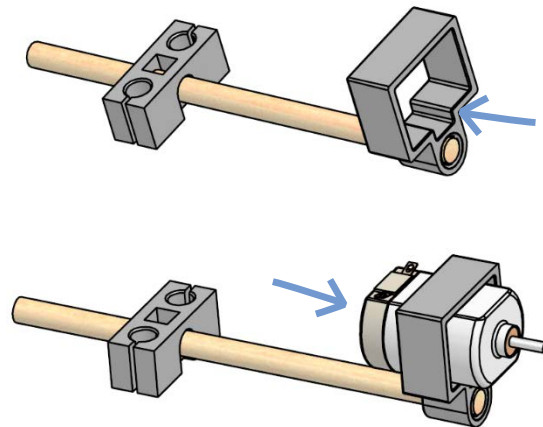
- 2 Push a **dowel** into the **perpendicular block** to create the turbine tower.



- 3 Cut a 100mm (4") **dowel** and tap a **perpendicular block** onto the **dowel** as shown.



- 4 Push the **mini motor mount** onto the **dowel** from Step 3 and slide the **1.5V mini motor** into the **mini motor mount**.

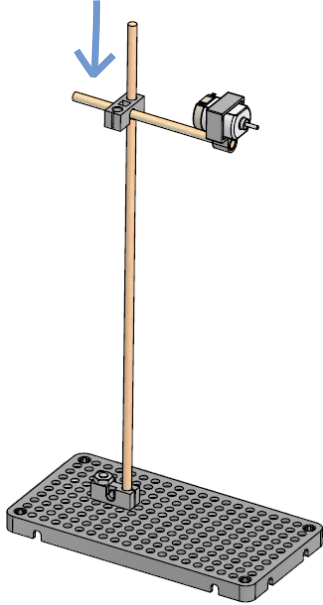




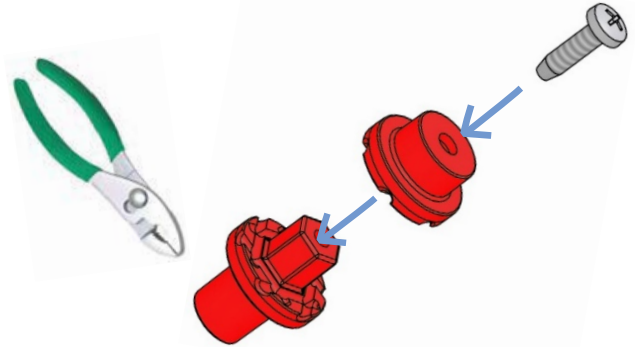
Mini Wind Turbine Build



- 5 Slide the **perpendicular block** onto the turbine tower **dowel**.



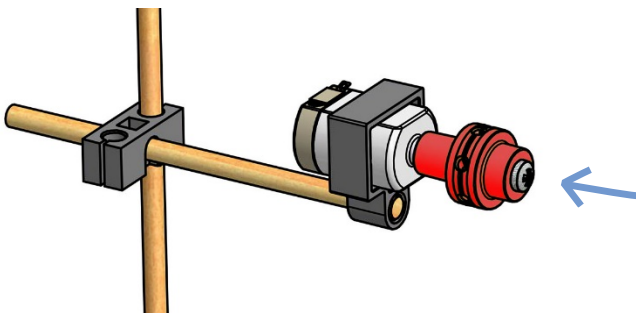
- 6 Attach the **mini hub cover** to the **mini hub base** using a **#6 screw**, but keep the screw slightly loose.



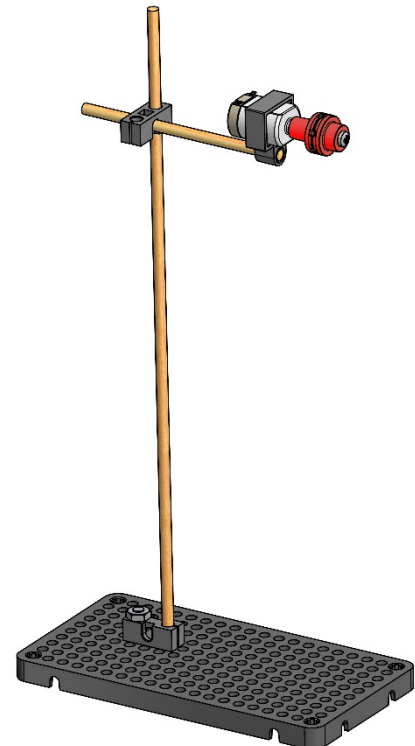
Quick Tip

Hold the base with *pliers* when loosely turning in the screw.

- 7 Press the **mini hub** onto the **1.5V motor shaft**.



- 8 Yea! Your turbine stand is done! Time to make the rotor.

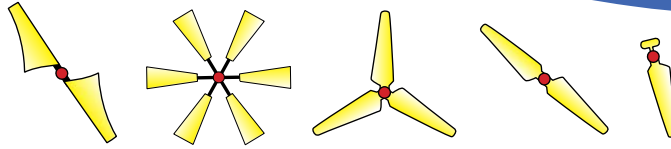




Mini Wind Turbine Build

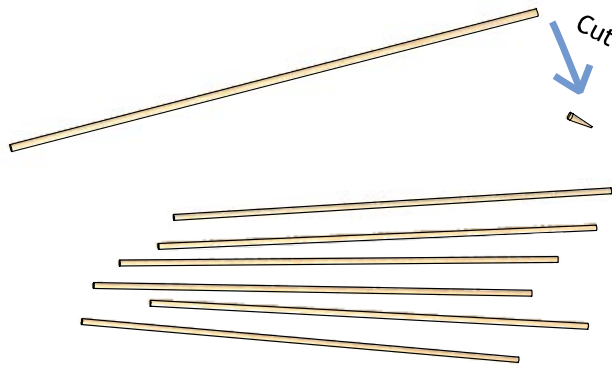


Blade Designs



It's now time to experiment with blade designs. Change the shape, number (between 1 & 6), and the angle of the blades.

- 9** Cut the points off the **skewers**.
Note: you will only use three of the skewers to start. The others will be for your own design.

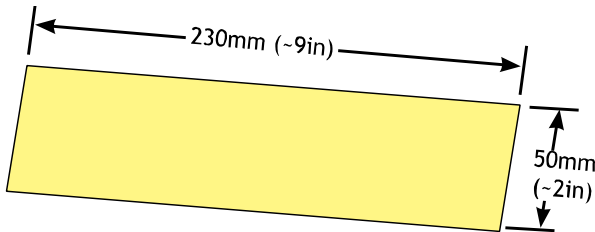


- 10** Find materials for your **blades** like recycled materials, poster board, card board, plastic, etc.

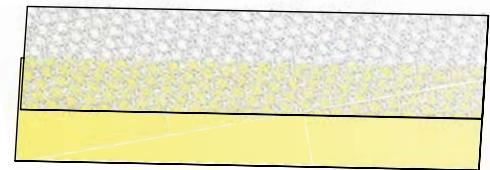
You will also need **tape** (Duct Tape works best).



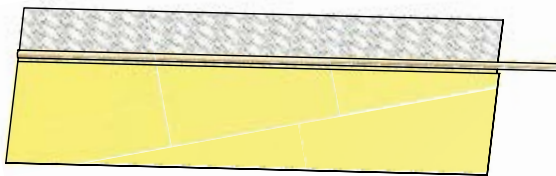
- 11** Design your **blades** and start by making 3 **blades** (below is one method).



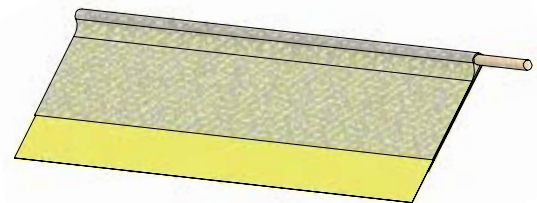
Cut a section of **blade** material.



Place the **tape** half over the edge of the **blade** material.



Face sticky side up and place a **skewer** at the edge of the **blade** material, overhanging to one side.



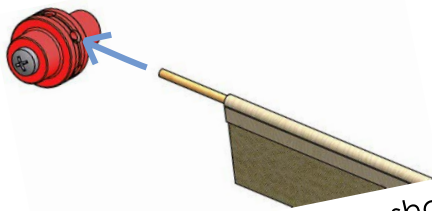
Fold the **tape** over the **skewer** to secure to the **blade** material.



Mini Wind Turbine Build

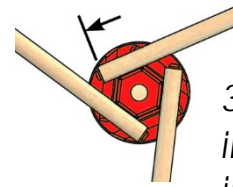
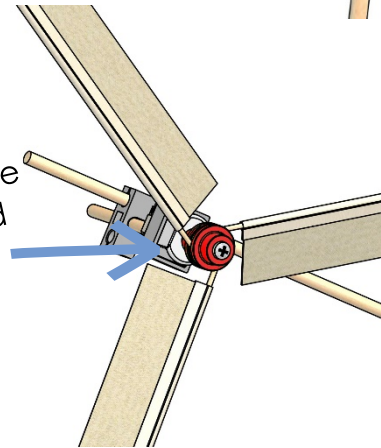


- 12 Attach your **blades** to the **hub** by loosening the **screw** (about a $\frac{1}{4}$ turn) to allow the **skewer** to slide in.

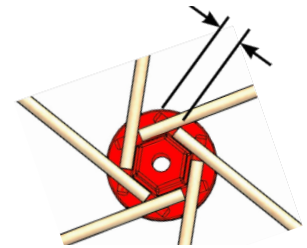


Blades should be equally spaced in the **hub**.

Remember:
Re-tighten the **screw** when **blades** are properly positioned.



3 or fewer **skewers** insert all the way into the **hub**.

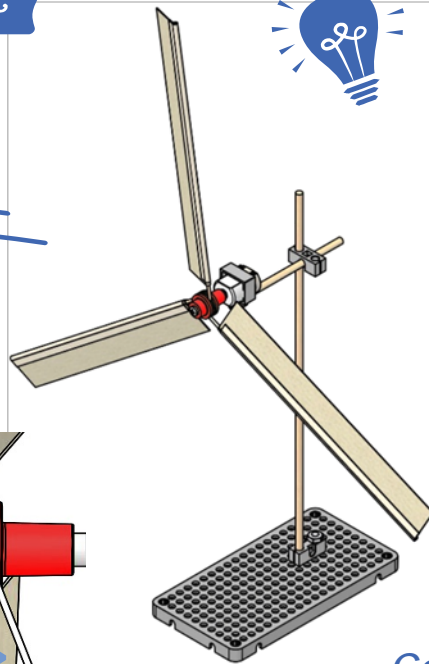
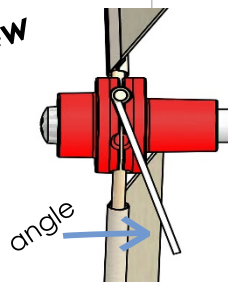


6 **skewers** can be inserted as shown.

Experiment & Innovate



Change your **blades** pitch when **screw** is loosened.



1. How can you change the blade design to spin faster?
2. Would smaller blades increase power produced?
3. How would a different blade material or type work?

Congratulations!

Now try your design in the lab.

