Go Guide Wind Lift

Learn about wind energy by designing your very own Wind Lift!

You Are Here

Choose how you would like to complete this activity.
Download documents & videos at teachergeek.com/lift

Go Guide

Start here! Build your Wind Lift, evolve your design, and begin the Heavy Lift Challenge!

Optional Labs

- Energy Lab (Ages 9+)
- Blade Angle Lab (Ages 11+)
- Blade Area Lab (Ages 11+)

Optional Challenges

- Heavy Lift Challenge*
- Speed Challenge*

*See Page 6

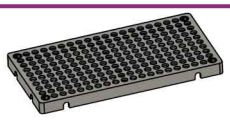
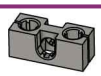
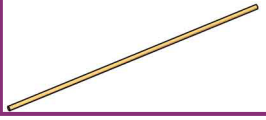
Check out our **Wind Lift Videos** by scanning the QR Code or going to **teachergeek.com/lift**

Go Guide Wind Lift

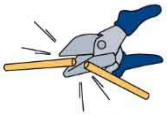
Supplies

LIFT PARTS

These are the parts you need to build one Wind Lift.

NAME	QTY	PICTURE
Hole Plate SKU 1821-32	1	
Block SKU 1821-34	4	
Slide Stop 7 cm (3 in) SKU 1821-22	1	
Nuts # 10 Hex SKU 1821-25	2	
Screws 25 mm (1 in) SKU 1821-22	2	
Mini Hub Screw SKU 1821-67	1	
Mini Hub Cover SKU 1821-67	1	
Mini Hub Base SKU 1821-67	1	
Portion Cup SKU 1823-68	1	
Wire 15 cm (6 in) SKU 1821-43	1	
String 45 cm (18 in)	1	
Chipboard 22 cm x 5 cm (8.5 in x 2 in) SKU 1823-48	3	
Project Sticks 25 cm (10 in) SKU 1821-18	10	
Dowels various sizes SKU 1821-20	4	 Dowel Sizes 2x 30 cm (12 in) 1x 25 cm (10 in) 1x 15 cm (6 in)

Have a Maker Cart? Use Multi-Cutters to cut your own dowels.



INCLUDED TOOLS

Reamer

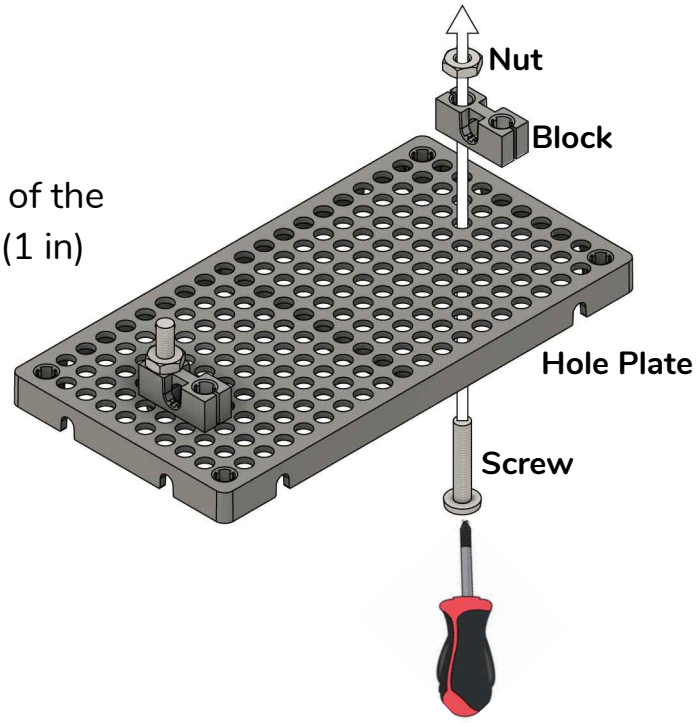
MATERIALS YOU SUPPLY

- **Fan**
- **100 Pennies**
  or jelly-beans, screws, nuts, etc. to use as weights
- **Tape**
- **Phillips Screwdriver**
- **Recycling Materials**

Optional Tools

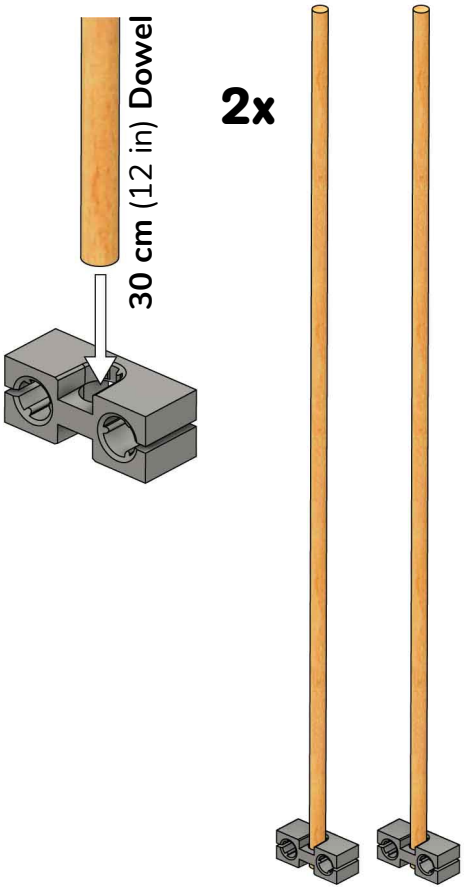
Modify materials to make even more creative designs with the **Maker Tool Set** SKU 1823-84

Build The Base

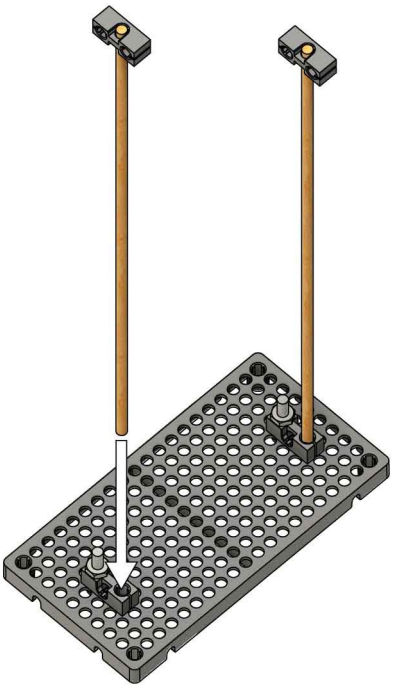


1. **Attach two blocks** to the top of the **hole plate** using **two 25 mm** (1 in) **screws** and **two nuts**.

2. **Wiggle** or tap **two 30 cm** (12 in) **dowels** into the **center holes** of the **blocks**.



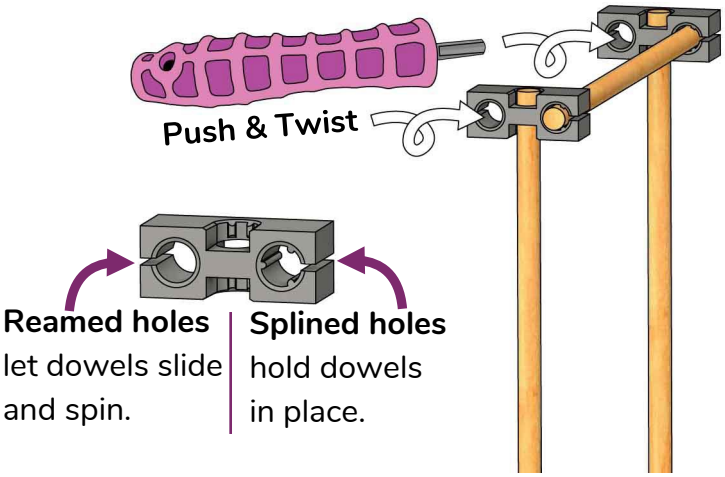
3. **Push** the **dowels**, from Step 2, **into** the **blocks** on the hole plate.



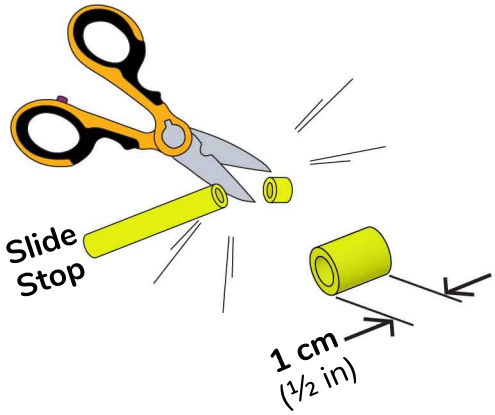
4. **Push** the **15 cm** (6 in) **dowel into** the top **blocks**.

Add the Axle

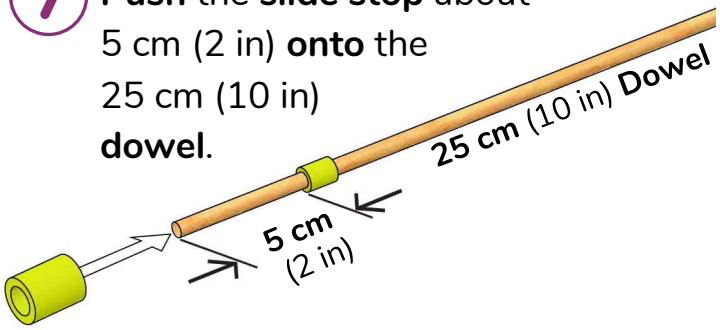
5 **Ream** the **two holes**, as shown, to remove the splines (teeth).



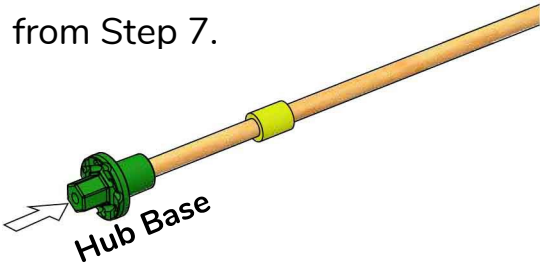
6 **Cut** a **1 cm** (½ in) section of **slide stop**.



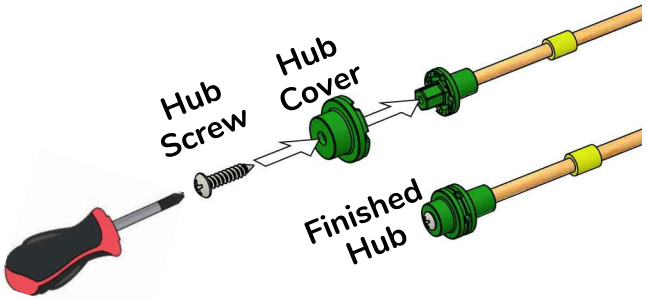
7 **Push** the **slide stop** about 5 cm (2 in) **onto** the 25 cm (10 in) **dowel**.



8 **Push** or tap the **hub base** **onto** the end of the **dowel** from Step 7.



9 **Attach** the **mini hub cover** **with** the mini hub **screw**.

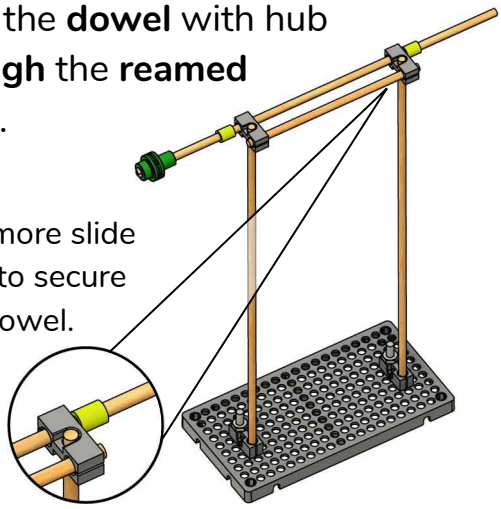


Hard to Tighten?

Try **loosening** the **screw** one full turn, then retightening it.

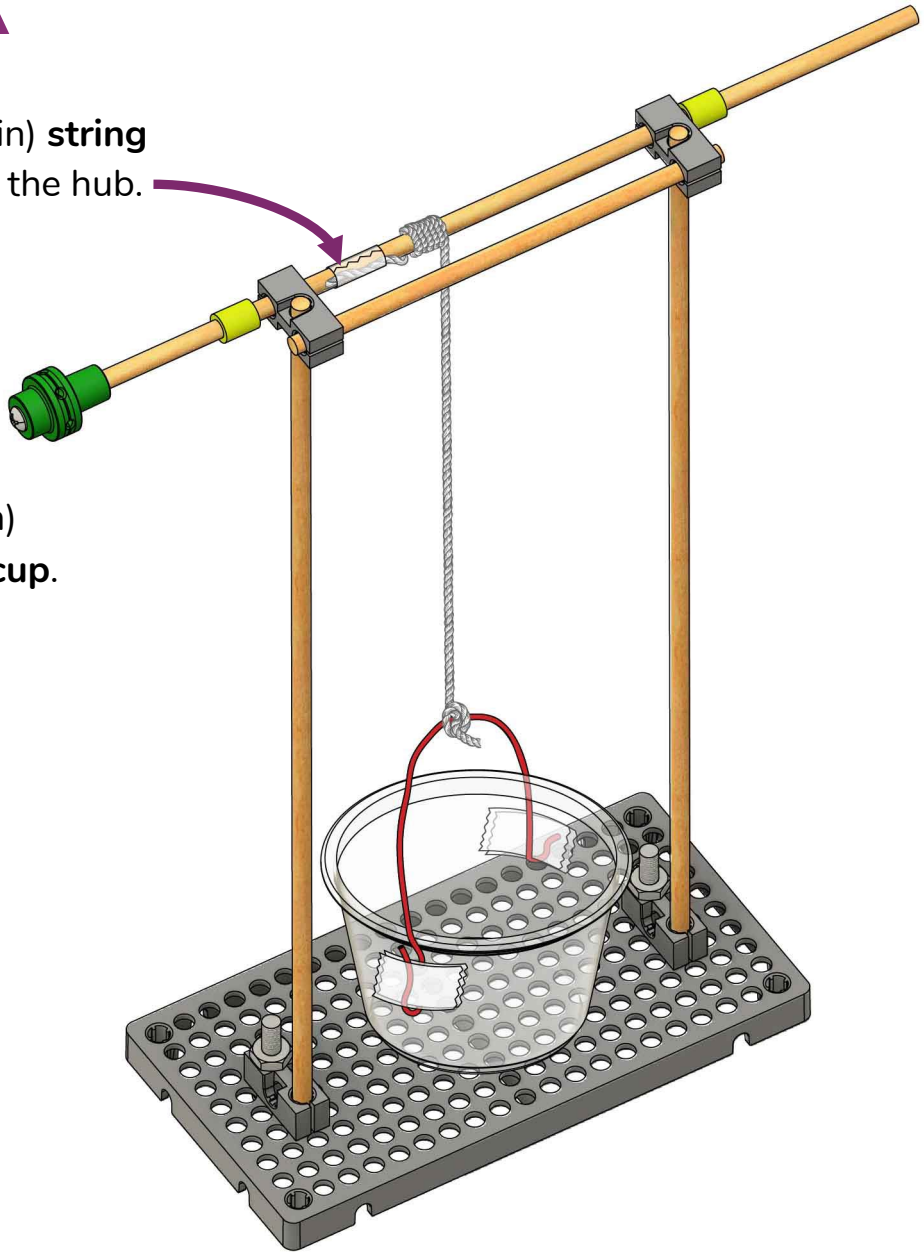
10 **Slide** the **dowel** with hub **through** the **reamed holes**.

Use more slide stop to secure the dowel.

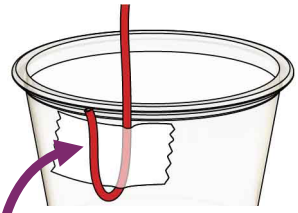


Make The Lift

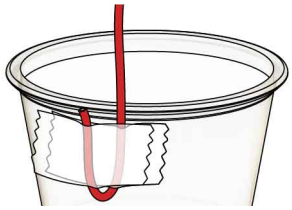
11 **Tape** the 45 cm (18 in) **string onto** the **dowel** with the hub.



12 **Tape** the 15 cm (6 in) **wire to** the **portion cup**.



Tape the wire to the cup, leaving some extra.



Fold the extra over, then tape again.

Repeat on the other side of the cup.

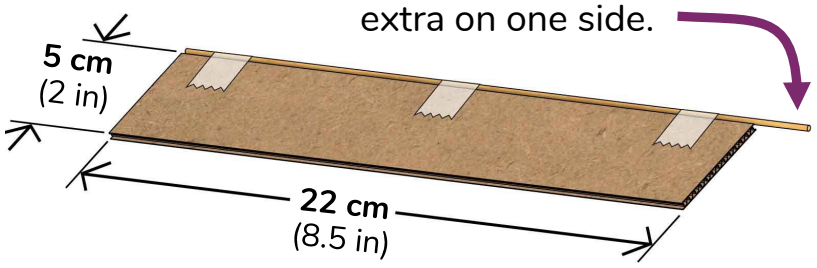
13 **Tie** the **string to** the **cup**'s wire to finish your lift. Spin the dowel to test it out, then continue on to add blades that capture wind power!

If using this activity in a classroom, your lift mechanism can be re-used by kids year-after-year as they engineer and test different blade designs.

Add Blades

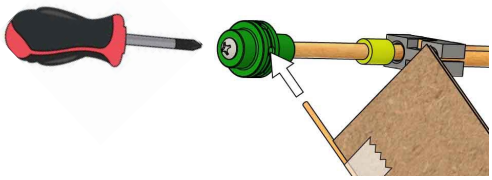
14 Get **three** 22 cm x 5 cm (8.5 in x 2 in) **pieces** of **chipboard**.

3x

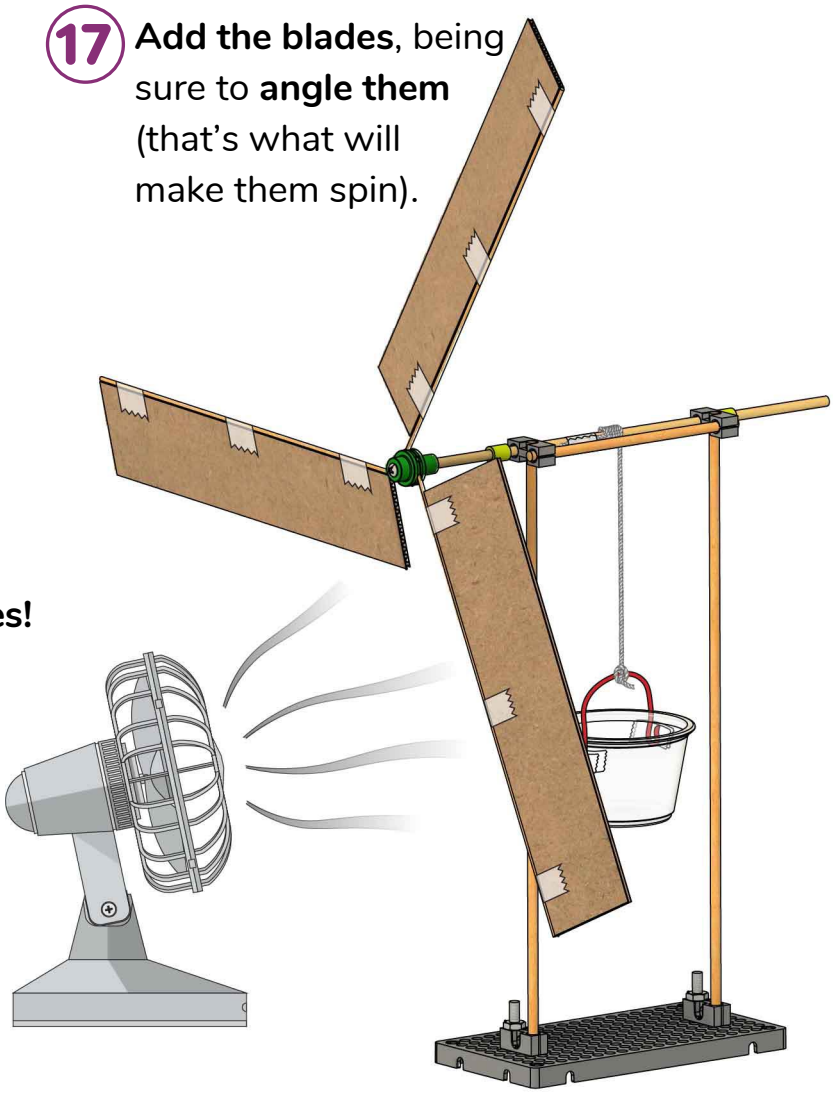


15 **Tape** a **project stick to** each **edge**, leaving some extra on one side.

16 **Loosen** the mini hub **screw** just enough to allow the blades to be pushed in (about 1 ½ turns).



17 **Add the blades**, being sure to **angle them** (that's what will make them spin).



18 **Tighten** the hub **screw** and **test it out!**

It's time for labs or challenges!

Complete one of the optional labs below or continue on to set up for an engineering challenge!

- **Energy Lab** (Ages 9+)
- **Blade Angle Lab** (Ages 11+)
- **Blade Area Lab** (Ages 11+)

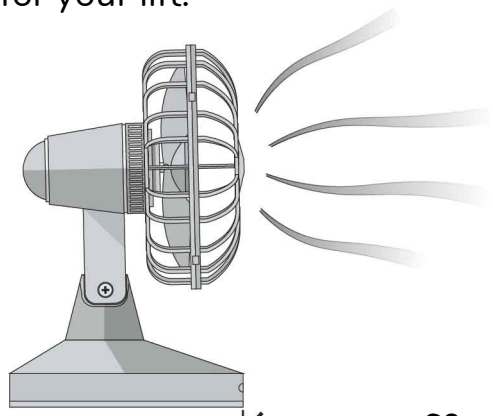
Download these labs at **teachergeek.com/lift**

Heavy Lift Challenge

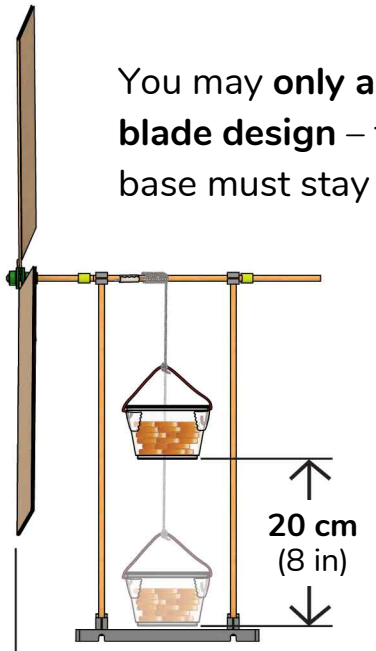
Engineer your Wind Lift to raise the most weight possible!

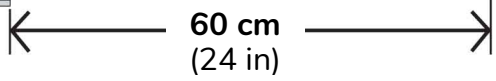
Constraints:
(rules and limits for your design)

The **fan** must be the **only power source** for your lift.



You may **only alter the blade design** – the lift and base must stay the same.





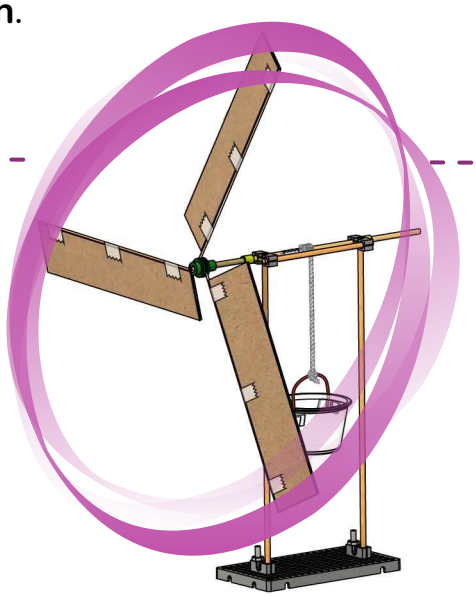
Your **wind lift** must be at least **60 cm** (24 in) **from** the **fan**.

Weights must be **raised** at least **20 cm** (8 in).

Speed Challenge

Engineer your Wind Lift to raise 10 pennies in the shortest time possible!

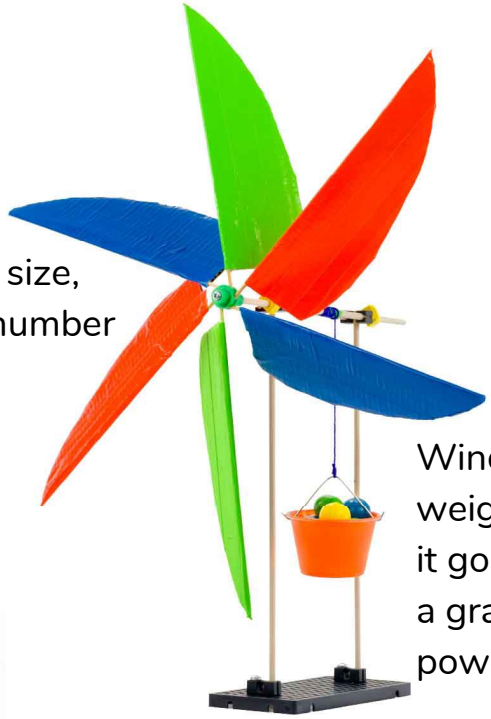
Use the same constraints as the Heavy Lift Challenge.



Make It Your Own!

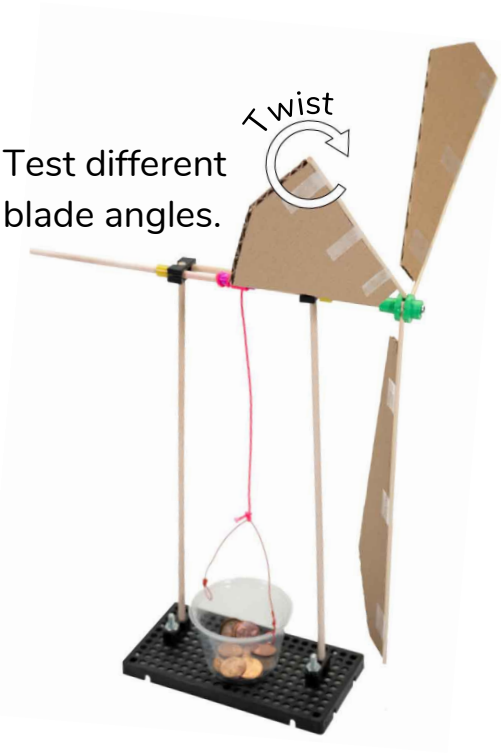
What will you use for blades?

Time to engineer your own blades for the wind lift! Try using cardboard, card stock, cereal boxes, plastic bottles... there are tons of ways to make turbine blades!



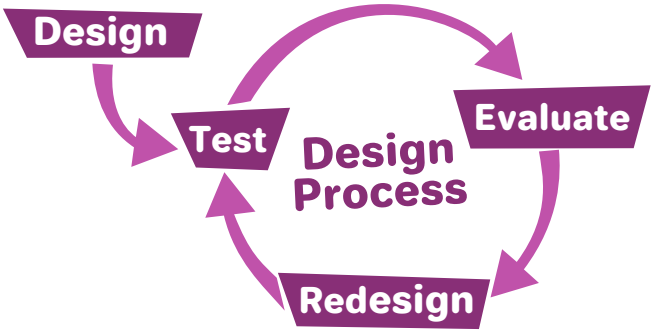
Change the size, shape and number of blades.

Wind up the weight and let it go to make a gravity-powered fan!



Test different blade angles.

Make unique 3D shapes by cutting up plastic bottles and other recyclable materials.



The design process never ends! There is no perfect design.