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

> Choose how you would like to complete this activity. Download documents & videos at shop4-h.org

#### You Are Here Go Guide

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



Optional Challenges
-Heavy Lift Challenge\*
-Speed Challenge\*

\*See Page 6

# **Supplies**

### **LIFT PARTS**

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

/ NAME	<b>/Q</b> TY	/ PICTURE
Hole Plate SKU 1821-32	1	
<b>Block</b> SKU 1821-34	4	
<b>Slide Stop</b> 7 cm (3 in) SKU 1821-22	1	
<b>Nuts</b> # 10 Hex SKU 1821-25	2	$\bigcirc$
<b>Screws</b> 25 mm (1 in) SKU 1821-22	2	t
Mini Hub Screw SKU 1821-67	1	Danna
Mini Hub Cover SKU 1821-67	1	
Mini Hub Base SKU 1821-67	1	
Portion Cup SKU 1823-68	1	$\bigcirc$
<b>Wire</b> 15 cm (6 in) SKU 1821-43	1	
<b>String</b> 45 cm (18 in)	1	
<b>Chipboard</b> 22 cm x 5 cm (8.5 in x 2 in) SKU 1823-48	3	
<b>Project Sticks</b> 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**



### **MATERIALS YOU SUPPLY**

- Fan •
- 100 Pennies or jellybeans, nuts, etc. to use as weights
- Tape
- **Phillips Screwdriver**
- **Recycling Materials** (to use for turbine blades)





Modify materials to make even more creative designs with the Maker Tool Set SKU TGMTS

### **Build The Base**

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





**2**x

Push the dowels, from Step 2, into the blocks on the hole plate. Push the 15 cm (6 in) dowel into the top blocks.

Nut

Screw

Block

Hole Plate



**30 cm** (12 in) **Dowel** 





Repeat on the other side of the cup.

**3** 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.



# **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.



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

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



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!





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



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