Name(s): **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Some wind turbines/windmills have blades with a lot of area, while others have blades with very little area.

Make sure you have a built TeacherGeek Wind Lift, before starting this lab.



**1. Hypothesis:** How do you think the Wind Lift blade area affects the number of pennies that can be lifted?

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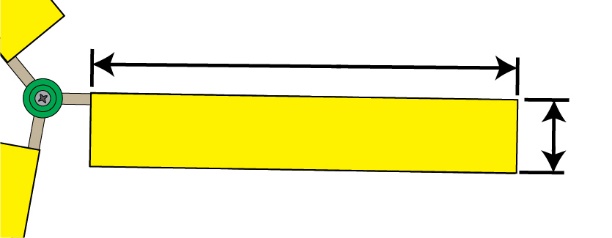
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**Get Ready**

Make sure that your blades are 23cm x 5cm. If they are not, cut new blades and tape them on. They should be like this.

****



23cm

****

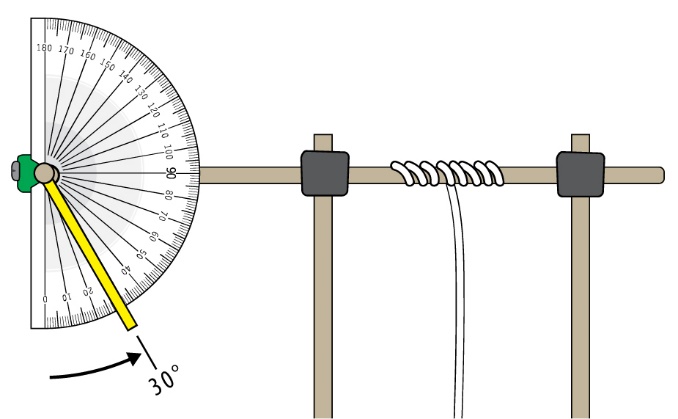
5cm

Blade Area:

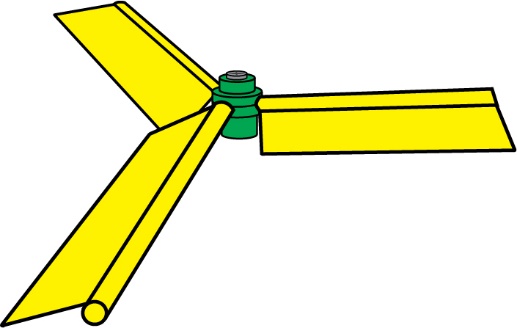
23 x 5 = 115cm2

115cm2 x 3 = 345 cm2

Blade Area x # of blades = total area



Set the angle of your blades to approximately 30°.



**Change the blade angle** **by**:1. Loosening the hub screw a little bit; so the blades can turn, but do not fall out. 2. Changing the blade angle using a protractor. 3. Tightening the screw up again.

**Test your Hypothesis:** How does blade area affects the number of pennies that can be lifted?

|  |  |  |
| --- | --- | --- |
| **Use your 5cm wide blades.** | **Cut your blades to 3cm wide.** | **Cut your blades to 1 cm wide.** |
| 5cm | 3cm | 1cm |
| **2.** What is the combined area of all of the blades?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    **3.** What is the maximum number of pennies that can be lifted?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **4.** How long does it take to lift the bucket?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ seconds | **5.** What is the combined area of all of the blades?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    **6.** What is the maximum number of pennies that can be lifted?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **7.** How long does it take to lift the bucket?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ seconds | **8.** What is the combined area of all of the blades?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    **9.** What is the maximum number of pennies that can be lifted?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **10.** How long does it take to lift the bucket?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ seconds |

**11.** Was your hypothesis correct? Please explain why, or why not (don’t just write “yes” or “no”).

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