

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

### **Variable**

What variable will you test for your experiment? \_\_\_\_\_

### **Constants**

What variables do you have to keep the same (constant) as you perform this experiment?

### **Experimental design**

Describe how you will perform this experiment.

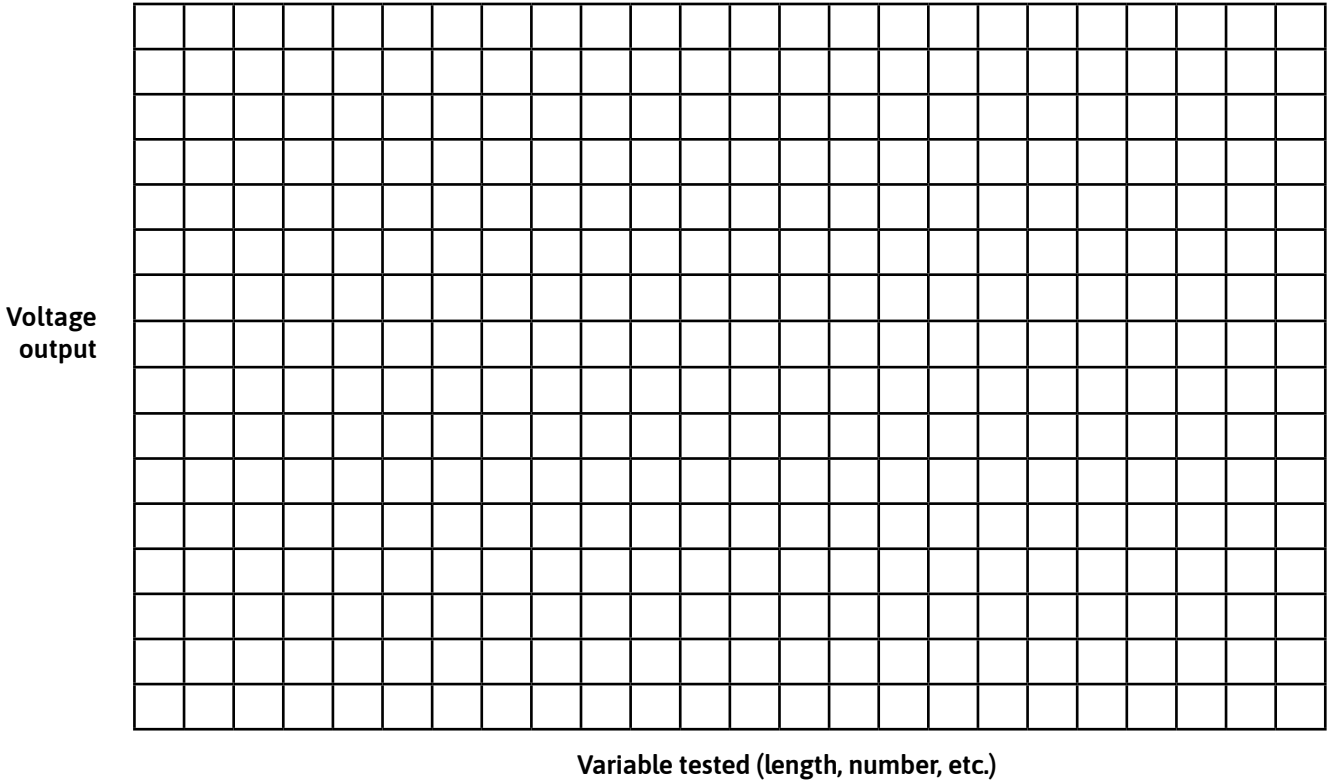
1. What materials will you use?
  
  
  
  
  
  
  
  
  
  
2. How many times will you change your variable?
  
  
  
  
  
  
  
  
  
  
3. How long will you run the test?
  
  
  
  
  
  
  
  
  
  
4. How will you change your variable?
  
  
  
  
  
  
  
  
  
  
5. What will you use to measure your output?

### **Hypothesis**

6. What do you think will happen?
  
  
  
  
  
  
  
  
  
  
7. Why do you think this will happen?

LOW SPEED		HIGH SPEED
VARIABLE (e.g., length, in cm)	VOLTAGE (mV or V)	VOLTAGE (mV or V)

Graph your data

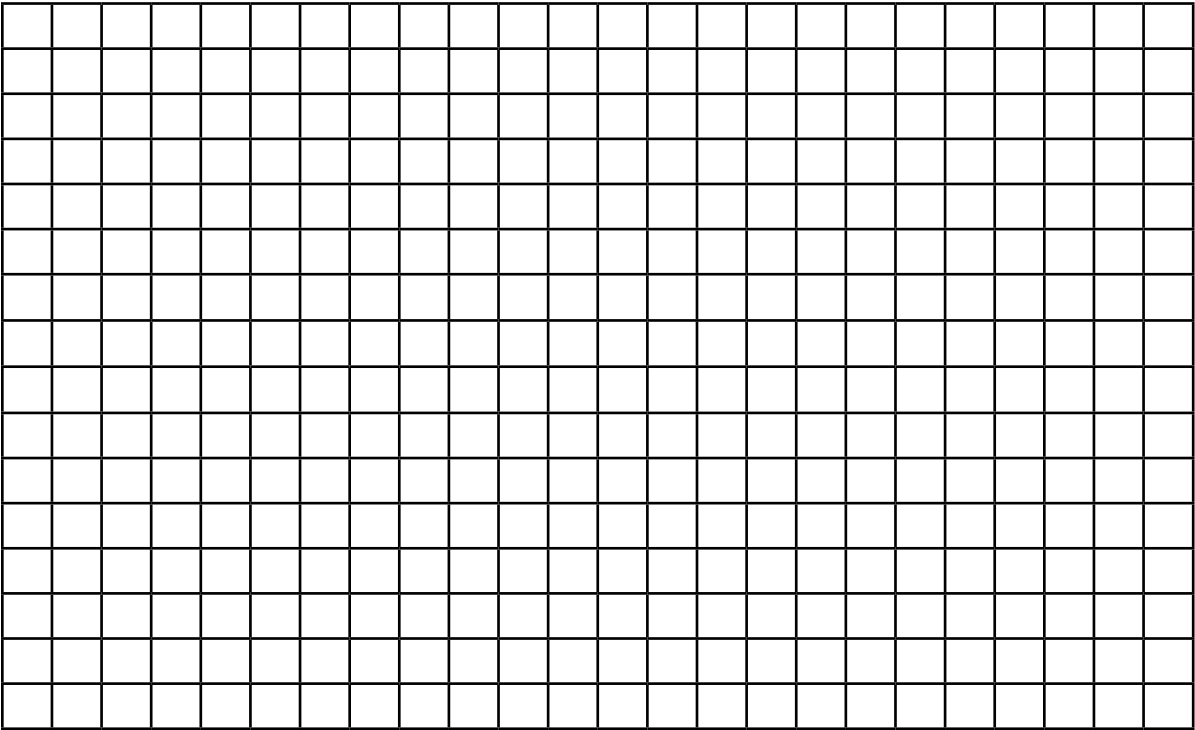


LOW SPEED			
VARIABLE (e.g., length, in cm)	VOLTAGE (mV <b>or</b> V)	AMPERAGE (mA <b>or</b> A)	(V × A) = POWER (mW <b>or</b> W)

HIGH SPEED			
VARIABLE (e.g., length, in cm)	VOLTAGE (mV <b>or</b> V)	AMPERAGE (mA <b>or</b> A)	(V × A) = POWER (mW <b>or</b> W)

Graph your data

Voltage  
output



Variable tested (length, number, etc.)

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### What happened?

1. How did the voltage change as a result of manipulating the variable?
2. What was the optimal setting, or value, for the variable that you tested?
3. Do you think that the variable you tested has a large or small effect on how much power the turbine can make? Based on your graph, justify your answer.
4. What problems did you encounter as you performed your experiments? How could you fix these problems?

**Class results**

Record the results from the class experiments in the table below.

**Power = Voltage (V) × Current (A)**

Make sure you are recording volts and amps (not milliamps). 1 A=1,000 mA

VARIABLE	VOLTAGE (V)	AMPERAGE	POWER OUTPUT
(e.g. length cm)		(extension) (mA or A)	(optional) (mW or W)
<b>15 cm</b>	<b>1.7 V</b>	<b>100 mA</b>	<b>0.17 W</b>

1. If you were a lead design engineer, what would you recommend your company do to their turbine blades based on the class results? Why?