

PicoTurbine

Wind 101

Preview

Recommended Materials:

- PicoTurbine Savonius Windmill Kit V2
- 7 Function Digital Multi-meter
- Additional Student Resource Guides

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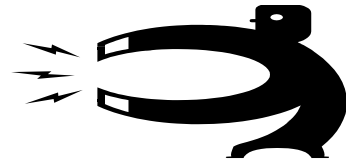
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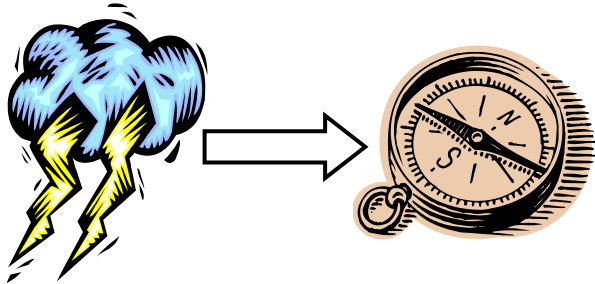


An Overview of Electromagnetic Induction



Getting Started:

When lightning strikes, why would the needle on nearby magnetic compass move?

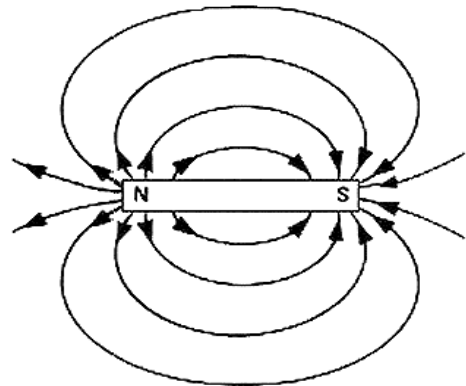


Lightning strikes occur because of a flow of charges from the ground to the clouds. Once lightning strikes an electrical charge is created. It was discovered in 1820 that there was a relationship between electric charges and magnetism!

Now you know that electricity can be captured to produce magnetism. But, magnetism may also be captured to produce electricity. This is a process known as **electromagnetic induction**.

Lets first examine magnetic fields. List what you notice in the picture to the right, below.

Student answers will vary: Point their attention to the direction and shape of the magnetic field.



When a wire carries an electric current, there is a field around the wire as well.

Define it, and then apply it!

Electromagnetic Induction- *go over electromagnetic induction in this lesson, and revisit the topic after students have completed the kits. See if they can label the parts of the Windmill.*

Name: _____

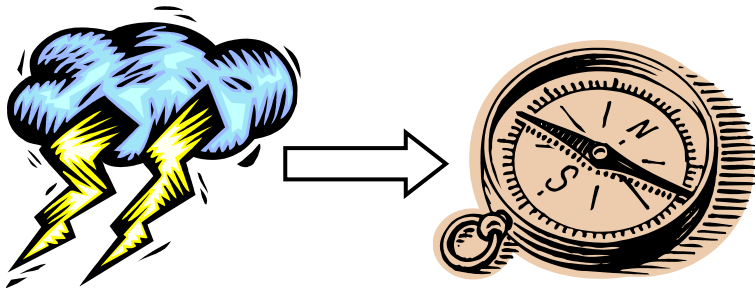
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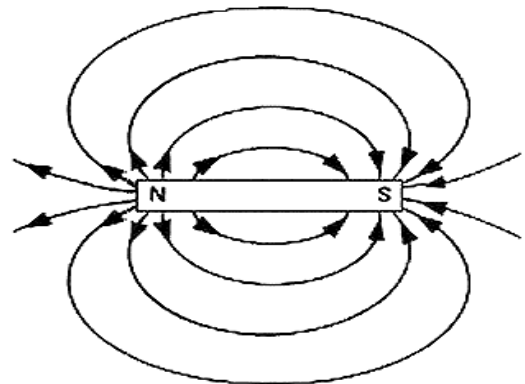
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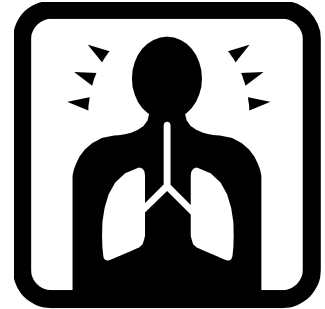
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Electromagnetic Induction-

Name: _____

Date: _____

Project Overview: Lung Power



Directions:

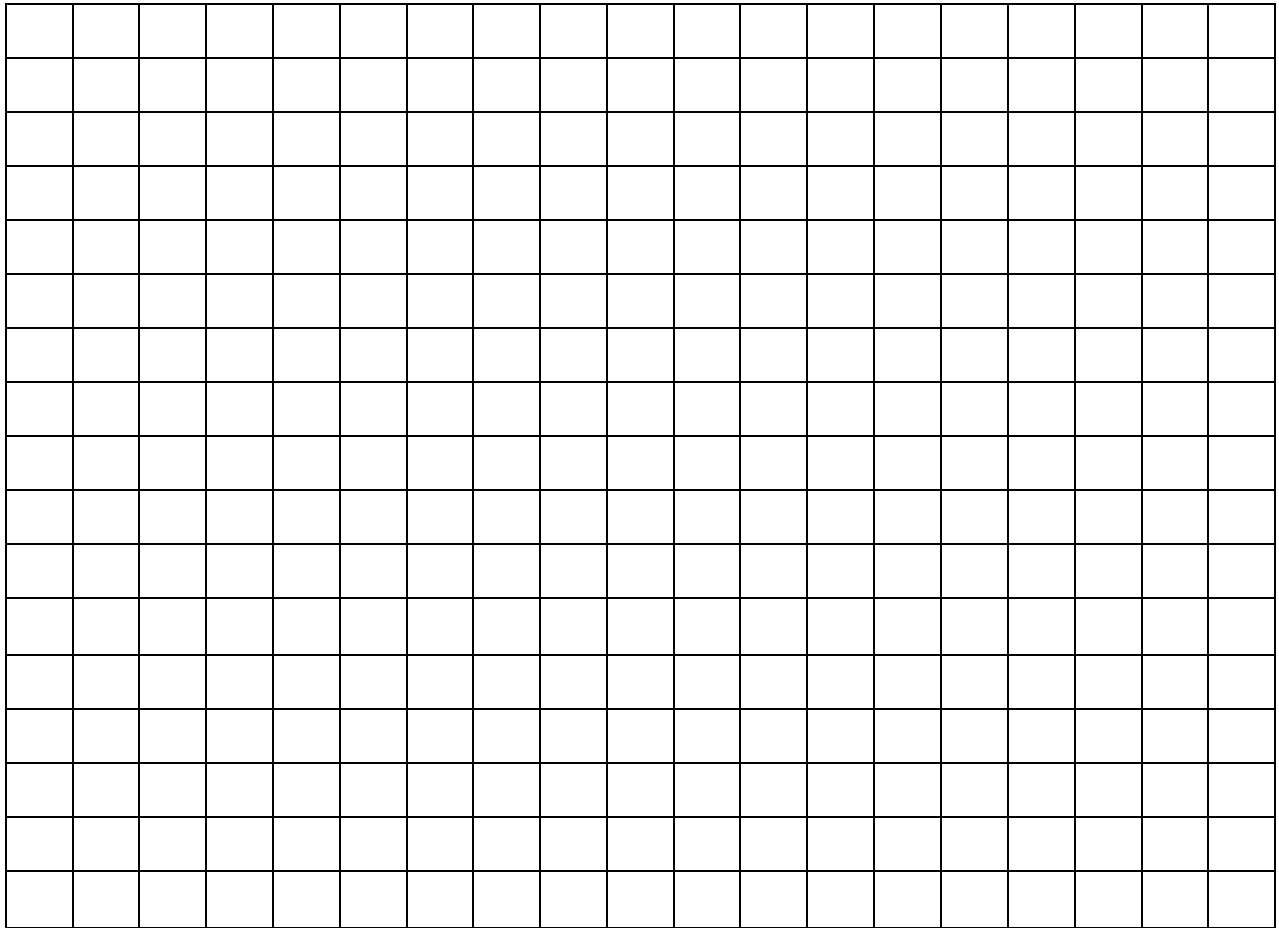
After you class has constructed the PicoTurbine Savonius Windmill V2 kit, everyone will test their lung power! You and each of your class mates have three tries to power the windmill kit. Out of those three tries, the one that produces the most energy is the one the class will record on the graph on the back of this sheet.

Use the space below to record your classmates' tries. Circle the best one.

Name Student Name	Try #1 Volts generated	Try #2 Volts generated	Try #3 Volts generated
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

For this activity, the instructor will need to use voltmeter to measure energy output! This is not provided in the kit. If you do not have access to one, the activity can be modified to an informal lesson where students get to try and power the windmill. They just would not complete the graph, but it still is fun!

Who can generate the most power?



Plot the results of each person on your graph. Once you have completed that, find the average amount of energy produced. The winning team is the one with the highest average energy produced!