

  
**HOME SCIENCE TOOLS®**

**WIND TURBINE STUDY KIT**

**KT-WINTURB**

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SAMPLE

5. Place the wind turbine in the location related to the box fan in Activity 1 you found the motor spun the fastest.
6. Turn the box fan to a low setting.
7. Observe the LEDs.
8. Record observations in the table.
9. Use the multimeter to test the volts and amps of using the two motors in a series circuit.
10. Record the volts and amps in the table.
11. Using the same materials, set up a parallel circuit by connecting the two motors together. The positive leads should be connected together and the negative leads connected together.
12. Connect the LEDs to the motors by attaching alligator clip leads to each side of the motors and then connecting the free clips to the LED.
13. Repeat Steps 5–10.

	Series Circuit	Parallel Circuit
<b>Observations</b>		
<b>Volts</b>		
<b>Amps</b>		

Was your hypothesis correct? Explain.

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## TROUBLESHOOTING:

- If the LEDs don't light up, turn off the fan, swap the alligator clips on the LEDs, and then turn the box fan back on.
- If the LEDs won't light up using the low setting on your fan, change it to a medium setting.

## What happened?

When you connected the motors in a series circuit, there was twice the amount of voltage. However, the amperage was the same as with one motor.

In contrast, when you connected the motors in a parallel circuit, there is twice the current, but the same number of volts.

While both the parallel and series circuits produced the same amount of power, their currents (amps) and voltages were different from one another.

## IDEAS FOR FURTHER STUDY

Wind power and alternative forms of energy are important areas of study and there is always more to learn! In this kit, you've experimented in many ways with wind power.

We encourage you to explore related products and articles at [www.homescientertools.com](http://www.homescientertools.com), or you could head online or to the local university or library to learn more.

Here are some additional experiments or areas of study you might be interested in:

- Try using other electronics with the wind turbine such as a mini buzzer.
- Try using multiple box fans to experiment with wind current.
- Try using the wind turbine outside on a windy day.
- Make your own water wheel.
- Study solar power.

Ready to branch out to another science topic? If you liked this kit, try the Oil Spill Cleanup Experiment Kit from [www.homescientertools.com](http://www.homescientertools.com) for an excellent hands-on environmental science experience.

## GLOSSARY

**Amperage:** A measure of the strength of the electric current in amperes.

**Ampere:** The amount of electric charge – the number or volume of electrons – flowing per a unit of time.

**Atom:** The smallest piece of an element that is still that element which everything is made of.

**Current:** The rate at which electrical charge moves through a circuit.

**Electron:** A negatively charged subatomic particle that circles around the nucleus.

**Electrical Energy:** The energy of moving electrons.

**Generator:** A machine that converts mechanical energy to electrical energy.

**Hypothesis:** A prediction of what you think will happen in a scientific experiment.

**Kinetic Energy:** The energy of motion or movement of objects or particles.

**Mechanical Energy:** A form of kinetic energy that is the energy of motion.

**Neutron:** A subatomic particle that has no charge and is found in the nucleus of an atom.

**Nonrenewable Resource:** A natural resource that does not have an unlimited quantity or will not naturally replenish at the speed in which we use it.

**Parallel Circuit:** A circuit where electricity flows along several paths to different devices.

**Potential Energy:** Energy stored in the position or state of an object that ready to be used.

**Power:** The rate at which work is done.

**Power Plant:** A building or series or buildings where electrical power is generated and distributed.

**Proton:** A positively charged subatomic particle found in the nucleus of an atom.

**Renewable Energy:** A natural resource that is unlimited in quantity or naturally replenishes quicker than we use them.

**Resistance:** A measurement of a material's opposition to the flow of electric current.

**Series Circuit:** A circuit where electricity flows along only one path to one or more devices.

**Terminal:** A point of connection used to close an electrical circuit.

**Voltage:** The potential energy between two points in a circuit, causing electrons (electric charge) to move from one point to another.

SAMPLE

