

# STUDENT HANDOUT

Student Name: \_\_\_\_\_

- *Is the smell of an incoming storm related to electricity?*
- *Has anyone ever harnessed the energy that causes you to shock someone when you touch him after walking across the carpet?*
- *What kind(s) of energy is that?*

This electrical spark can reach 2 inches long or more. The Wimshurst Machine is a generator belonging to the influence machine category. That means it separates electronic charges through electrostatic induction, generating high voltage. Premium Wimshurst Machine comes with safety handles to help avoid shock, and a stabilizing bar

Two large discs rotating opposite of each other have a number of foil strips on them. If one strip is positively charged, and it passes another strip on the other plate, the positively charged one attracts the electrons in the neighbouring strip to the surface next to the positive one. This process repeats as the discs revolve until one of the strips on the other disc passes one of the brushes positioned on either side of the discs. This brush discharges the positive charge on the opposite side of the strip to where the electrons have migrated. As the strips part, this second strip is now charged negatively. This negative charge will now repel electrons on strips on the other disc as they pass. Once again, brushes dissipate the negative charge on the outside of those strips, leaving a net positive charge. The continuous sequence of induced charges accumulates and if it were not for the current drawn would continue until the insulation broke down. The positive and negative charges are collected by metal combs to charge the Leyden jars, attached by electrodes (metal bars) to the apparatus. The mechanical energy used to separate the opposing charges on the neighboring strips that develops the energy source for electrical output. (<http://en.wikipedia.org/1/23/10>)

## Vocabulary

- 1 Capacitor:** a device for accumulating and holding a charge of electricity
- 2 Current:** a flow of something, like a river, or electricity
- 3 Electrodes:** a conductor, not necessarily metallic, through which a current flows  
Electrostatic charge:4. inactive electrical amount
- 4 Induction:** the process causing a body with electric or magnetic properties produces magnetism, an electric charge, or an electromotive force in a neighboring body from a distance.
- 5 Ions:** an electrically charged atom, or group of atoms, formed by the loss or gain of one or more electrons
- 6 Leyden Jar:** a device for storing electric charge, consisting essentially of a glass jar lined inside and outside, for about two-thirds of its height, with tinfoil. A type of capacitor.
- 7 Voltage:** the difference between electric potential of two points in space, or of an electrical circuit, expressed in volts.

