



# Leyden Jar Kit

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## **Safety first:**

- Always ask your participating students if any of them are wearing pacemakers or have heart problems. They should not participate in the following activities. They should be given alternative assignments.
- Never surprise or scare anyone with a Leyden Jar.

## **CHARGING UP A LEYDEN JAR**

**Material provided:** Leyden Jar

**Safety first:** REMEMBER THE SAFETY RULES.

It is best to always work with a partner.

**Materials to collect:** Electrophorus, proof plane, and rabbit's fur.

## **Procedures:**

- Remove the inner part of the Leyden Jar from the plastic container. Make sure you have tightened the screw on the rod with the ball on it to the bottom cup of the Leyden Jar. Carefully insert the inner part of the jar into the plastic container.
- Place your electrophorus in front of you. If the electrophorus is assembled, remove the aluminum disk from the acrylic plate using the plastic handle. Position the Leyden Jar within arms reach of the electrophorus.
- Briskly rub the acrylic plate with the rabbit's fur for a minute. What type of static charge are you creating? Record your observation.
- Have your partner grasp the insulating handle of the aluminum disk. Place the aluminum disk on the acrylic plate.
- Have your partner touch only the upper side of the aluminum disc. Quickly remove their hand. Did the person receive a small shock? Do you know why? Record your answer.
- Use the insulating handle of the aluminum disk to remove it from the acrylic plate. Quickly touch the aluminum disk to the electrode (knob) of the Leyden Jar. Did you observe anything? Record your observation

- Now bring the proof plane near the knob of the Leyden Jar. Did anything happen? Record your observation
- It is not necessary to rub the acrylic plate again unless no charges are produced. Repeat touching the knob of the Leyden Jar with the aluminum disk that has been recharged by placing it on the acrylic plate 5 times. Test with the proof plane again.
- Now try it with 10 touches to the acrylic plate and the Leyden Jar. Bring the proof plane towards the Leyden Jar. Which attempt caused the greatest spark?
- If a sufficient charge is not being built up, charge up the acrylic plate again. Repeat the activity again and touch again with the aluminum disk after discharging the Leyden Jar.

## **Analysis:**

Your electrophorus was charged up by friction. Electrons were transferred from the rabbit's fur to the acrylic plate. The acrylic plate acquired a negative charge. When an individual touched the upper side of the aluminum disk, some electrons flowed to ground through your body. When you picked up the aluminum disk with the insulated handle and touched the knob of the Leyden Jar, you transferred a small charge over to the electrode of the Leyden Jar. When you brought the neutral proof plane (equal number of protons and electrons) near the knob of the Leyden Jar, a spark was observed and maybe heard. The greater number of times the knob of the Leyden Jar is touched by the aluminum disk, the greater charge is gathered.

The Leyden Jar is a scientific instrument that stores electrical charges. The electrode is separated from the outside cup by an insulator. You should not touch the electrode and the outer cup with your hand because you would have made a complete circuit. A complete circuit allows electrons to flow.

## **Critical Thinking:**

If an individual touched the electrode of the Leyden Jar, what would they possibly feel?