PART I.

Title - The Electrophorus

Problem - How can a device known as an electrophorus be used to detect static charges?

Hypothesis - Charging up the electrophorus and performing a number of activities on it will allow you to see, hear and feel static charges in action.

Materials - Square sheet of Styrofoam, fur pelt, Styrofoam cup, and aluminum pie plate

Procedure - 1. Obtain a sheet of Styrofoam, a piece of fur and a pie plate attached with a Styrofoam cup to be used as a handle.
2. Rub the Styrofoam briskly yet gently with the piece of fur. This causes electrons from the fur to be rubbed off onto the surface of the Styrofoam sheet.
3. Handle the pie plate by the attached cup and place on the Styrofoam sheet.
4. Touch the lip of the pie pan with your fingertip.
   Describe the electron movement that occurred and the charge on the pan.

5. Now using the attached cup as a handle, lift the pie plate from the Styrofoam sheet and touch it again.
   Describe the electron movement that occurred and the charge on the pan.

6. Return the pie pan to the Styrofoam sheet and touch it again, then lift it and touch it again.
   This process will go on forever, where do the electrons come from?

7. Based on your observations in Part I of this lab, answer the following questions.
   A. What would happen if you handle the electrophorus by the pan instead of the cup?

   B. What charge did you give the whole pie plate when it was placed on the negatively charged surface of the Styrofoam sheet?

   Why does it have this charge?

   C. What happens to the electrons when you are discharging the electrophorus?

   D. What happens to the electrons when you are recharging the electrophorus?
Use the **Pie plate Electrophorus** and do the following activities. Write a **Result or Observation**. (Use the **Fur with the PVC pipe** and the **Plastic bag with the Acetate strip**, when needed.)

1. **Neutral Electroscope**
   - Bring each item near by not touching the collecting sphere and record what the gold foil leaves do in each case.
   - **A.** Styrofoam sheet after being rubbed with fur.
   - **B.** Pie plate rim sitting on the Charged Styrofoam sheet.
   - **C.** The entire pie plate lifted off the Styrofoam after being grounded.

2. **Negative Electroscope**
   - Bring each item near but not touching the collecting sphere and record what the gold foil leaves do in each case.
   - **A.** The rim of the pie plate is **negative**, while it is sitting on the **negative** Styrofoam.
   - **B.** The whole pie plate is **positive** after it is discharged and then lifted up.

3. **Positive Electroscope**
   - Bring each item near but not touching the collecting sphere and record what the gold foil leaves do in each case.
   - **A.** The rim of the pie plate is **positive**, while it is sitting on the **positive** Acetate.
   - **B.** The whole pie plate is **negative** after it is discharged and then lifted up.

4. Discharge and recharge the pie plate 50 times, with only 1 charging of the Styrofoam square with the fur. What happens to the charge each time?

5. Run a neon bulb along the rim of the **Neutral Dipolar pie plate** while it is sitting on the charged Styrofoam square. What happens?
   - **A.**
   - Run a neon bulb along the rim of the **Positive** pie plate after it was discharged and lifted up. What happens?
   - **B.**

6. Run a fluorescent bulb along the rim of the **Neutral Dipolar pie plate** while it is sitting on the charged Styrofoam square. What happens?
   - **A.**
   - Run a fluorescent bulb along the rim of the **Positive** pie plate after it was discharged and lifted up. What happens?
   - **B.**