Sci 9 **Electroscope Activity** p294 Name: \_\_\_\_\_\_\_\_\_\_

**Introduction:**

The Law of Electrical Charges states that Like Charges Repel; Opposite charges attract; and a Charged object can attract a neutral one. Objects can be charged either by Friction (rubbing), Conduction (contact), or Induction (bringing near). When a charged object is brought near a neutral one, it can induce a separation of charges within the neutral object.

**Purpose:** To understand movement of charges when charging by conduction and induction.

**Materials**: Electroscope, acetate strip or glass rod, vinyl strip, paper towel, piece of silk.

**Procedure:**

1. Label a neutral electroscope (see page 282 of Probe 9 text):



1. Charge a vinyl strip by rubbing it with paper towel. What charge will it have?\_\_\_\_\_\_\_\_\_\_\_\_

Bring it near the electroscope, WITHOUT TOUCHING IT.

1. What happens to the leaves? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What method of charging is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Draw a diagram of the electroscope with charged vinyl strip near it and position of the leaves. Indicate the charge distribution on vinyl strip, ball, and leaves.
4. Recharge the vinyl strip, this time **touch it to the ball** of the electroscope.
5. What is the new leaf position? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Explain why this happened in terms of charge distribution.

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1. Neutralize (ground) the electroscope by touching the ball with your finger.
2. What is the new leaf position? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Explain why this happened in terms of charge distribution.

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1. Charge an acetate strip by rubbing it with paper towel (or a glass rod with silk).

What charge will it have? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Bring it **NEAR** the electroscope without touching.

1. What happens to the leaves? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. **GROUND** the electroscope by touching the ball with your finger.
3. Bring a negatively charged vinyl strip near the neutral ball without touching it. (The leaves should separate)
4. **Keeping the strip near, touch the ball with your finger**. The leaves should return to their original position. Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. REMOVE finger but KEEP vinyl still close. The leaves should stay in same position? Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Now remove vinyl strip. The leaves should separate. Explain why \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Why are the electroscope leaves made of thin gold foil?
3. What is the advantage of using an electroscope with two leaves over a single pith ball when investigating charges?