

### 9.3 Charging by Friction & The ELECTROSTATIC SERIES (pages 274-275)

What is: **Charging by Friction?** – When electrons are transferred by a rubbing action or friction.

#### The Electrostatic Series

When different materials rub together, electrons are transferred from the substance which has a weaker hold on its electrons to the substance which has a stronger hold on its electrons.

A list of substances in order from a weaker hold on electrons to a stronger hold on electrons is called an Electrostatic Series.

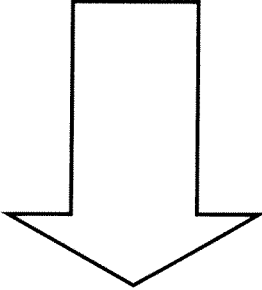
Therefore:

- **Substances higher in the list** – always lose electrons and become positively charged.
- **Substances lower in the list** - gain electrons and become negatively charged.

2 factors that affect the amount of static charge produced when you rub two different substances:

- 1) the amount of rubbing
- 2) ability of substances to hold on to electrons

❖ **Refer to Table 1 on page 275, and place the following substances we examined in order of the chart below:** fur/hair, ebonite, rubber, silk, glass, cotton

Substance	Increasing hold on electrons (tendency to gain electrons)
glass	
fur/hair	
silk	
cotton	
ebonite	
rubber	

**What kinds of charge will each of the following get when rubbed together?**

- ebonite \_\_\_\_\_ and fur \_\_\_\_\_
  - cotton \_\_\_\_\_ and glass \_\_\_\_\_
  - cotton \_\_\_\_\_ and rubber \_\_\_\_\_
  - silk \_\_\_\_\_ and glass \_\_\_\_\_
- e) From the demonstrations done in class, what charge did the wall, water and paper punches have? \_\_\_\_\_ Why? billon friction ?

**Home Fun ☺:**

**Read pages 274-275.**

**On a separate piece of paper, answer #1, 2, 3, 4 and 5 on page 275**