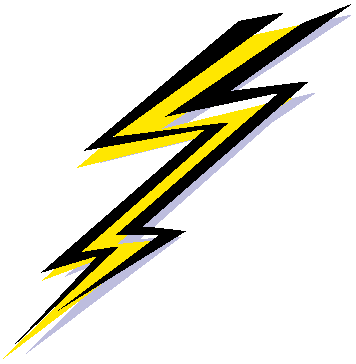
**Charging an Object**



**Recall: Forming an electric charge**

* Object that has an excess of electrons = \_\_\_\_\_\_\_\_\_\_\_\_\_
* Object has lost loss of electrons = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Object that has the same # of protons and electrons = \_\_\_\_\_\_\_\_\_\_\_\_\_

3 ways of transferring electric charges (or electrons):

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**1. Charging by Friction:**

* Objects made of \_\_\_\_\_\_\_\_\_\_\_\_ types of matter are rubbed together; this produces a static net \_\_\_\_\_\_\_ on each object because electrons are transferred during the process.
* Recall: ***Electrostatic Series***
  + Matter that has a \_\_\_\_\_\_\_\_\_ hold on electrons will \_\_\_\_\_\_\_ electrons and become \_\_\_\_\_\_\_\_\_\_\_
  + Matter that has a \_\_\_\_\_\_\_\_\_\_ hold on electrons will \_\_\_\_\_\_\_ electrons and become \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2. Charging by Contact:**

* Charging by contact happens when a \_\_\_\_\_\_\_\_\_\_\_\_ object touches a \_\_\_\_\_\_\_\_\_\_ object.
* Electrons will \_\_\_\_\_\_\_ in attempts to \_\_\_\_\_\_\_\_\_\_\_\_ the charges (spread out) – thus will move \_\_\_\_\_\_\_\_\_\_\_\_ the object has the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ZAP!**

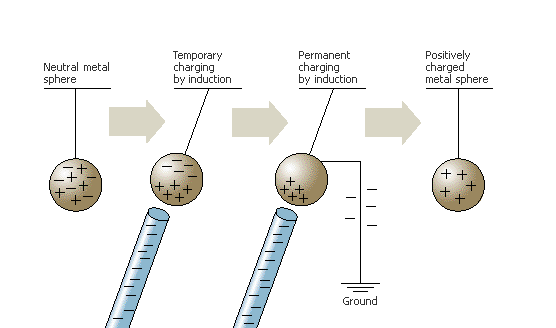
* + This happens \_\_\_\_\_\_\_\_ - can be surprising or painful
  + It can even ‘\_\_\_\_\_\_\_\_’ the gap prior to full contact
  + The result is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!
* The charged object acquires the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**; the total charge is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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**3. Charging by Induction:**

* A \_\_\_\_\_\_\_\_\_\_\_ object can transfer a charge to a neutral object ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
* Only \_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be charged in the induction process
* The \_\_\_\_\_\_\_\_\_\_\_ of the charged object forces the \_\_\_\_\_\_\_\_\_\_\_\_\_ of neutral object to \_\_\_\_\_\_\_\_\_\_\_.
* If the charging object is \_\_\_\_\_\_\_\_\_\_\_\_\_\_, the electrons \_\_\_\_\_\_\_\_\_\_\_\_\_.
* If the charging object is \_\_\_\_\_\_\_\_\_\_\_\_\_\_, the electrons \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The result: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* If there is a \_\_\_\_\_\_\_\_\_\_\_\_, electrons can move \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_ of the object being charged - the balance is changed and the object is now \_\_\_\_\_\_\_\_\_\_\_ - **The induced object obtains an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charge to originally charged object**.