04/07/2019

Forces and Fields

P30 Unit B: Intro to Electricity

Name: _____

Date: _____

Some basics from previous science course:

- Charge is separated into two types: positive and negative (Benjamin Franklin)
- All matter is made up of charged particles, usually in equal amounts (neutral)
- Negative charge is often due to a surplus of electrons
- Positive charge is often due to a deficit of electrons
- Like charges repel, opposite charges attract
- *Nature of charge* means "is the charge positive or negative"
- **Even neutral matter has charge, but we don't usually see the consequences of this until we separate the positive from the negative charge.**
- Conductors: materials that hold charge (electrons) and allow the charge to pass easily throughout the material. In a conductor, charge spreads out evenly. (example: metals)
- Insulators: materials that ~~how~~ hold charge (electrons), but don't allow the charge to pass easily throughout the material. In a insulator, charge remains in one spot. (example: rubber, wood, plastic)

Use pages 517 – 521 to complete the following summary.

Methods of Charging Objects

Law of Conservation of Charge: *defn*: the sum of the charge before contact is equal to the sum of the charge after contact.

The SI units of charge is the coulomb. The symbol is the C.

ex) A 5.0 kg steel ball with charge of 4.0 coulombs comes into contact with a neutral 5.0 kg steel ball. What is the overall charge on each ball?

Before: 4C → ← 0C

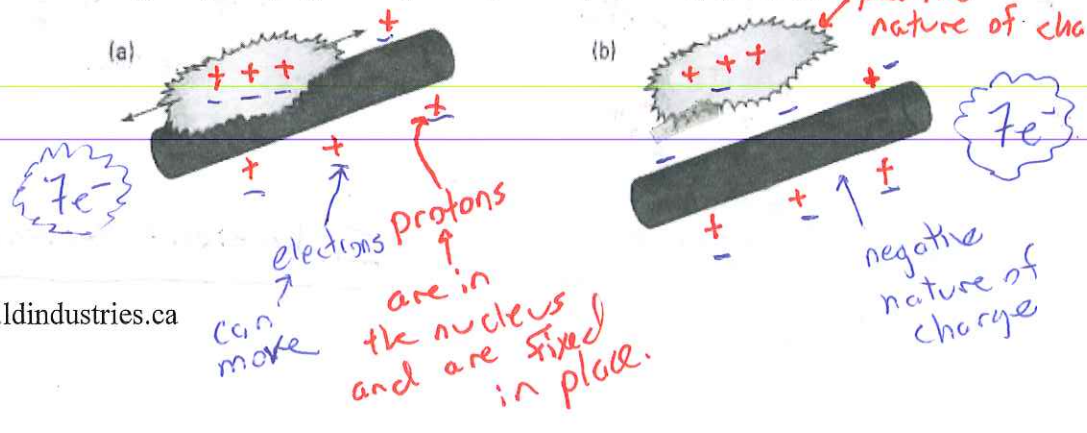
After: 2C, 2C

The charge averages out. * Charge sharing

Charging Objects by Friction: When two different materials rub against one another, electrons

When an object is charged by friction, both objects receive the opposite nature of charge. When are charging by friction, electrons are transferred.

Complete the diagram from page 518 of charge transfer through friction.



transfered.

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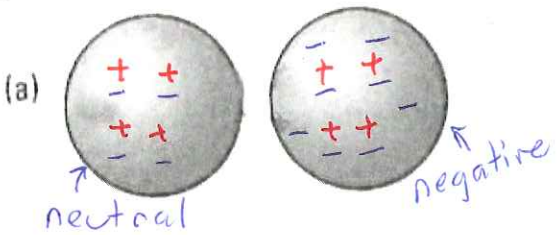
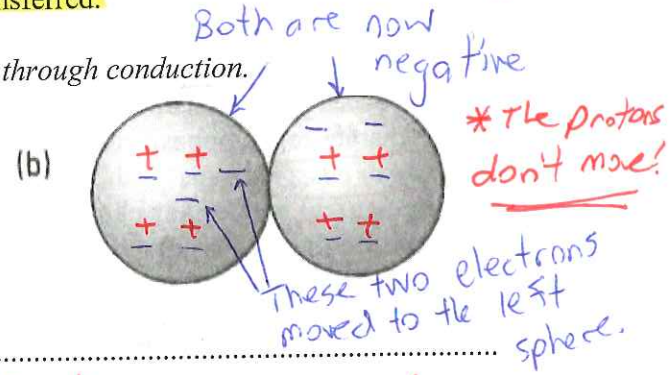
Defn: Triboelectric Series: is a list of which materials become positive and which become negative during friction.

Charging by Conduction: occurs when two objects come into CONTACT!

When a neutral object is charged by conduction, each object receives the same nature of charge. When charging by conduction, electrons are transferred.

Complete the diagram from page 519 of charge transfer through conduction.





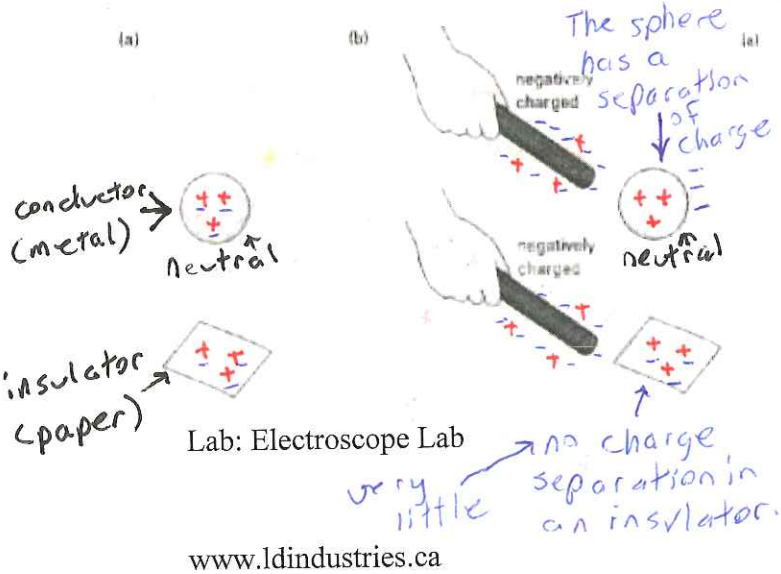
Charging Objects by Induction: occurs when a charged object comes near to a neutral object, but does not contact it.

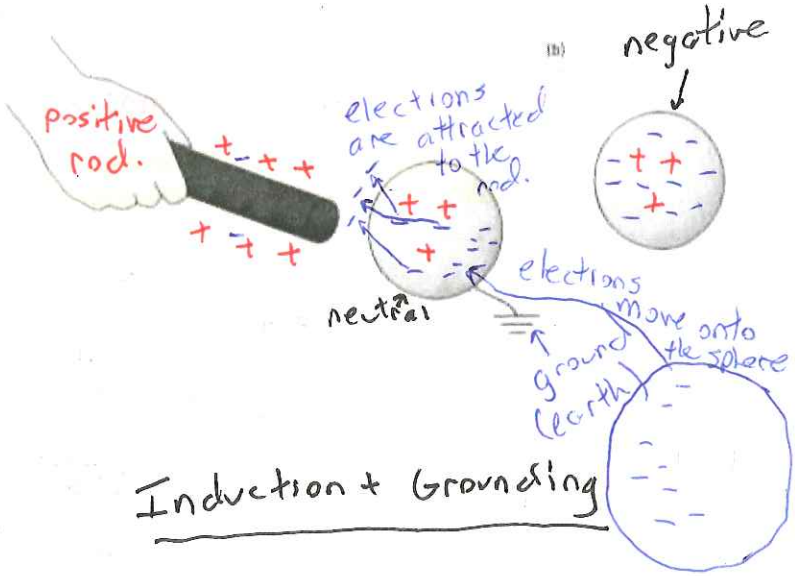
Defn: Charge Migration: occurs during induction. Electrons move during induction but return to original position afterwards.

Defn: Grounding: When an object is connected to the Earth. Electrons can move to or from the Earth.

When a neutral object is charged by induction and grounding, each object receives the opposite nature of charge. When charging by induction, electrons are transferred.

Complete the diagrams from pages 520 and 521 of charge transfer through induction.





Induction + Grounding

Lab: Electroscope Lab

www.ldindustries.ca