Science 9 Physics Notes Lesson 1 Name:

*Static!*

Objectives: By the end of the lesson you should be able to:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Physics Intro

* Physics: the study of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and its uses
* For this unit we will be focusing on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Energy

Electricity

* Electricity is the study of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and its uses
  + What is an electron?
  + Where is electricity used?
  + Why do we get shocked?
  + How do light bulbs work?
  + How does electricity actually flow?

Remember…

* An atom has \_\_\_\_\_ subatomic particles

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* There are positive and negative charges
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move fairly easily – Proton and neutrons do not!
* Add electrons = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Remove electrons =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Electrostatics

* Electrostatics = the study of ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** electrons
* **The Laws of Electrostatics:**
  + Opposite charges \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Like charges \_\_\_\_\_\_\_\_\_
  + Neutral objects are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to any charge
* An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ results from the movement of electrons by charged objects **nearby**, not by direct contact!
* An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ measures the amount of static electricity

The Coulomb!

* Charles Coulomb: lived during the 1700s
  + Developed a way to measure the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of electrons
  + Named the unit the Coulomb (C)
  + One C equals 6.24x1018 charges

Since 1 electron = 1 negative charge

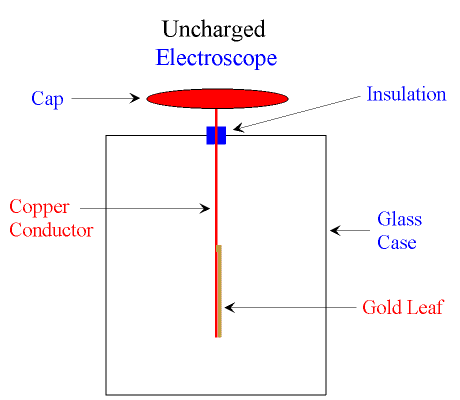
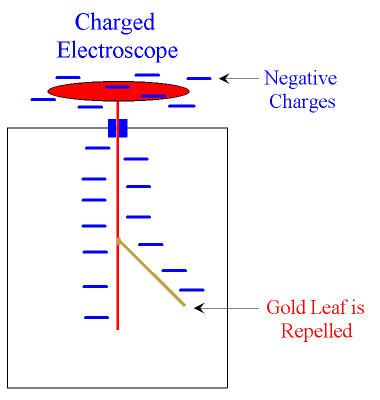
1 C = 6.24 x 1018 electrons *That’s a LOT of electrons!!*

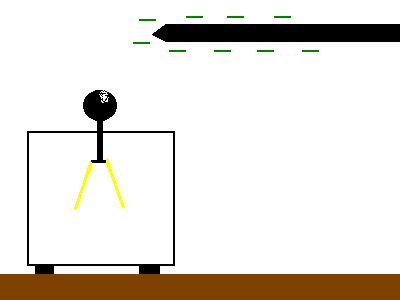
Creating Static Electricity

* ­­­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_between two objects causes one object to \_\_\_\_\_\_\_\_\_\_\_\_ electrons and the other object to \_\_\_\_\_\_\_\_\_\_\_ electrons



Measuring Static Electricity: use an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



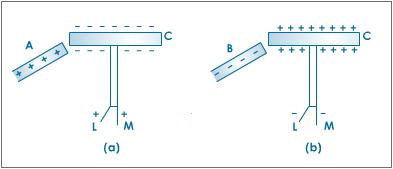
Transferring Static Electricity

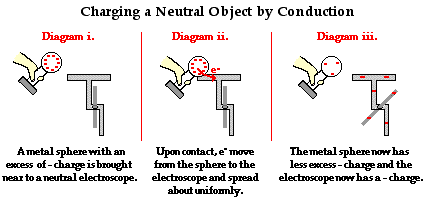
**Conduction:**

* A charged object \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ another object and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons

**Induction:**

* A charged object \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ another object and a charge results





Conductors

* Allow electrons to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ freely
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are excellent conductors because they can \_\_\_\_\_\_\_\_\_\_\_ electrons easily

Insulators

* Do not allow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move freely
* Glass, plastics, ceramics and dry wood are good insulators

Dangers of Static Electricity

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can build up charges via friction between their tires and the road
* Thus they have to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the charges before they fuel up [or else…](https://www.youtube.com/watch?v=T6VKxmUPb3g)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ must also do this!
* Lightning rods are placed on top of buildings to protect them from lightning

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: provides a path to the Earth (ground)