**7.1 Static Electricity.**

**Static Charges.**

In this chapter **we will learn:**

* Atoms with equal **\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_** charges are called **\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Atoms can become **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when electrons transfer in or out of a material
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** do not allow electric charges to move easily
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is a material in which electric charges can move more easily
* The unit for measuring charge is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* When you think of the word “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” you think of computers, televisions and other modern devices.
* The earliest studies of electricity had to do with static charges which refers to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that can be collected and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Can you think of some instances when you have been affected by static charges?
* Clothes coming out of a dryer
* Rubbing your feet on the carpet
* Touching a lock with a key and seeing a spark
* Lightening is when a static charge builds up in the ground during a thunderstorm.

**Early Theories of Electricity.**

* Benjamin Franklin discovered a type of “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” in certain objects when they were rubbed. He called a build up of this fluid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and a shortage \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Scientists still use these symbols to show the movement of electrical energy.

**Positive and Negative Charge in Atoms.**

* All matter is made of atoms - at their centre is a

nucleus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Surrounding

the nucleus are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Solid materials are charged due to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - when electrons are gained,

the object becomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When electrons are lost,

the object becomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



**Friction and Electron Transfer.**

* Electrons are most often \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

through friction, when objects rub against each other.

* Friction results in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Insulators and Conductors.**

* Materials that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are called electrical insulators.
* Some good INSULATORS are:
* plastic
* ceramics
* wood
* glass
* Only insulators are good at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Materials that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are called electrical conductors.
* Some good conductors are:
* metals (ex. copper, zinc, cadmium)

**Measuring Charge.**

* Unit of electric charge is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , named after the French physicist Charles Augusin de Coulomb.
* 1 C of charge is equal to the removal or addition of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* A typical lightning bolt carries \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Generating Static Charge.**

* A **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

uses friction to produce a large static charge on a

metal dome. The moving belt produces a static

charge at the base and this is carried to the top of

the dome where it is collected.

**Application of Static Electricity.**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ clings due to static charges.
* Static devices are used in industry to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from chimney stacks.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in homes.
* Static charges are used in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Dangers of Static Electricity.**

* When static charge builds up it can discharge and cause serious \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_.
* Those pumping flammables must ensure objects are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (connected to the Earth so that static charge is discharged).
* Lightning is especially dangerous - buildings can be protected with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**7.2 Electric Force.**

* Force is a push or pull - electric force can do both,

without touching the object - it is an

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force.

**Laws of Static Charge**

* Like charges \_\_\_\_\_\_\_\_\_
* Opposite charges \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Neutral objects are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Charging Objects.**

* Charging By Conduction
* Charging through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Extra electrons will move to a location

where there is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Charging by Induction
* Bringing a charged object nearby a
neutral object will cause charge
movement and separation in the
in the neutral object. 