

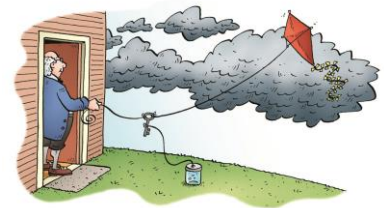
## Science 9 – What is Static Electricity? (Static Electricity Notes 1)

- The effects of static electricity are all around you
  - e.g. clothes from dryer, lightning, \_\_\_\_\_ from metal doors
- A **static charge** is an electric charge that is \_\_\_\_\_ (not moving).
- Eventually static charges are \_\_\_\_\_, or lost, to other objects or to the air.
- The study of static electric charge is called \_\_\_\_\_.
- We cannot see electric charge directly. Instead, we observe its effects:
  - e.g. \_\_\_\_\_ is a discharge of static electricity



### Types of Electric Charge

- Benjamin Franklin showed that lightning is a form of \_\_\_\_\_ by flying a kite during a thunderstorm.
- Because of experiments by Franklin and others, it was determined that materials can be:
  - Positively charged (+)
  - Negatively charged (-)
  - Uncharged or neutral (0)



### Atomic Structure and Electric Charge

- Recall from chemistry that all matter is made up of tiny particles called \_\_\_\_\_.
  - Three smaller (subatomic) particles make up the atom: \_\_\_\_\_, neutrons and \_\_\_\_\_.
- Protons and neutrons are strongly attached to the nucleus but electrons are outside of the nucleus and can be easily \_\_\_\_\_ or \_\_\_\_\_.
- Neutral objects are ones with \_\_\_\_\_ numbers of protons and electrons.
- Charged objects have acquired a negative or positive charge depending on whether they \_\_\_\_\_ (-) or \_\_\_\_\_ (+) electrons.

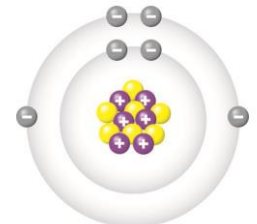
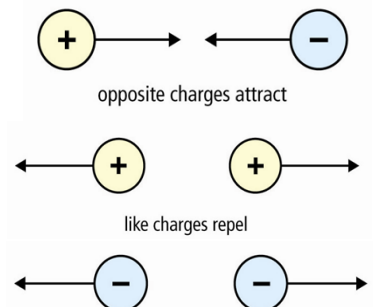


Figure 7.2 An atom

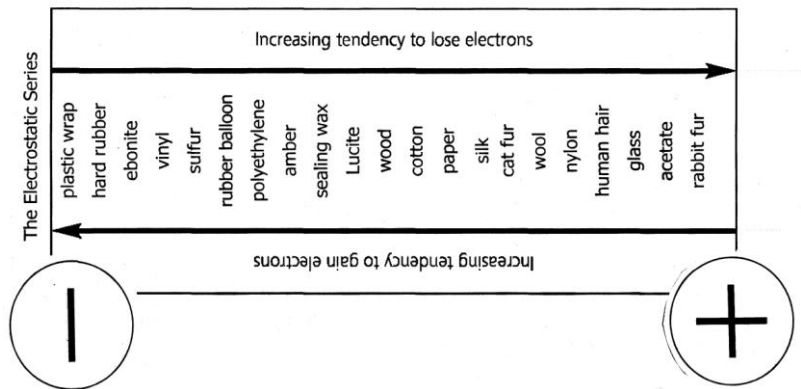
### Laws of Electric Charges

- The law of electric charges states that “like charges \_\_\_\_\_ and unlike charges \_\_\_\_\_”
- Two positive objects push away from each other
- Two \_\_\_\_\_ objects push away from each other
- One positive and one negative will \_\_\_\_\_ each other



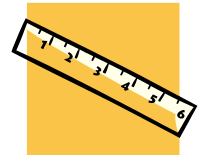
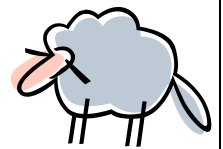
### Electrostatic Series

- A list of materials in order of increasing attraction for electrons.
- It shows you which object is more likely to \_\_\_\_\_ or \_\_\_\_\_ electrons when two objects are rubbed against each other due to \_\_\_\_\_ of electrons



### Static Electric Charge Examples

- An amber rod develops a \_\_\_\_\_ charge when rubbed with wool or fur.
- A plastic rod develops a \_\_\_\_\_ charge when rubbed with cotton
- When objects are rubbed against each other, they can transfer charge from one to another
  - only \_\_\_\_\_ move around – not \_\_\_\_\_
- Some materials are more likely than others to give up electrons.
  - Ex. When acetate (a type of plastic used in overhead transparencies) is rubbed with paper, the acetate develops a \_\_\_\_\_ ( ) charge and the paper develops a \_\_\_\_\_ ( ) charge.
  - Example: if rubber was rubbed with silk...silk is more likely to \_\_\_\_\_ electrons so it would become \_\_\_\_\_ charged, giving electrons to the rubber and making it \_\_\_\_\_ charged.



### Attraction of Neutral Objects to Charged Objects

- ◇ When a charged object is brought near to a \_\_\_\_\_ object, the electrons in the neutral object \_\_\_\_\_ so that the end of the neutral object is \_\_\_\_\_ to the charged object.
- ◇ Although there is a slight shift of charges within the neutral object, it \_\_\_\_\_ gain or lose electrons and is still neutral.
- ◇ This charging effect is known as **induced charge separation**.

