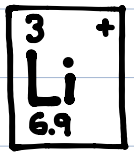
STATIC ELECTRICITY

7.1 - STATIC CHARGE

- STATIC CHARGE: ELECTRIC CHARGES THAT CAN BE COLLECTED AND HELD IN ONE PLACE
- TWO TYPES OF CHARE: POSITIVE, NEGATIVE

REVIEW: CHARGES IN AN ATOM

a) DRAW A BOHR DIAGRAM FOR A LITHIUM ATOM.



b) DRAW A BOHR DIAGRAM FOR A Li^+ ION.

- PROTONS HAVE A POSITIVE CHARGE.
- ELECTRONS HAVE A NEGATIVE CHARGE.
- IF THE NUMBER OF POSITIVE CHARGES EQUALS THE NUMBER OF NEGATIVE CHARGES, THE MATERIAL IS NEUTRAL.
- ELECTRIC CHARGE RESULTS FROM THE ADDITION OR REMOVAL OF ELECTRONS.

CONDUCTORS AND INSULATORS

- CONDUCTORS ALLOW ELECTRONS TO FLOW EASILY; INSULATORS DO NOT.

CONDUCTOR EXAMPLES:

- METALS

INSULATOR EXAMPLES:

- GLASS, PLASTIC, RUBBER, CERAMICS

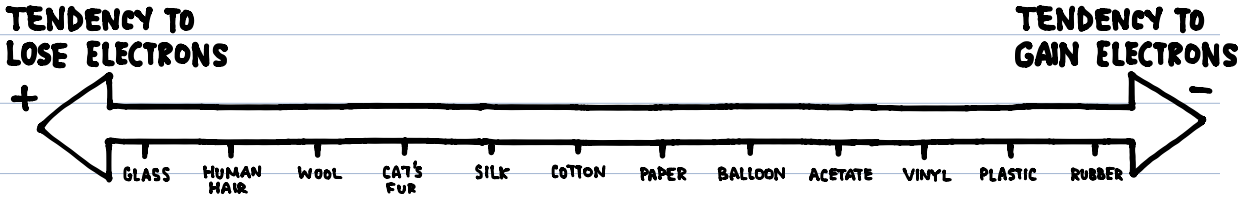
CHARGING OBJECTS

- OBJECTS CAN BE CHARGED BY FRICTION.

EXAMPLE:

- RUBBING FEET ON CARPET

- THE TENDENCY TO GAIN AND LOSE ELECTRONS IS SHOWN ON THIS SCALE (TRIBOELECTRIC SERIES).



- IF TWO OBJECTS ARE RUBBED TOGETHER, ELECTRONS WILL BE TRANSFERRED TO THE OBJECT WITH THE GREATER TENDENCY TO GAIN ELECTRONS (FURTHER TO THE RIGHT).

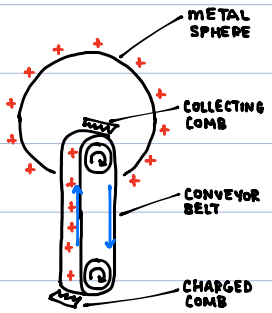
EXAMPLE:

A BALLOON IS RUBBED WITH A PAPER TOWEL.

a) WHAT IS THE CHARGE OF THE BALLOON?

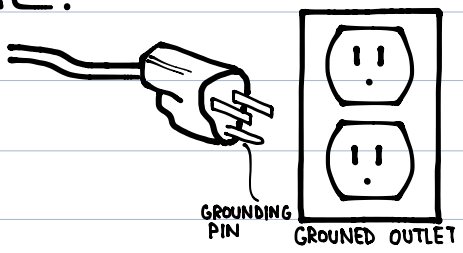
b) WHAT IS THE CHARGE OF THE PAPER TOWEL?

- STATIC CHARGE CAN BE GENERATED WITH A VAN DE GRAAFF GENERATOR.
  - STATIC CHARGE IS PRODUCED ON THE BELT AT THE BOTTOM.
  - THE CHARGE IS TRANSFERRED TO THE METAL DOME AT THE TOP.



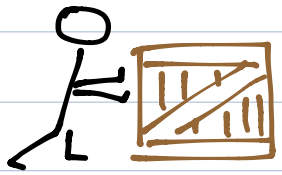
GROUNDING

- GROUNDING IS ALLOWING CHARGE TO FLOW INTO EARTH'S SURFACE.
- ELECTRICAL APPLIANCES CAN BE GROUNDED BY CONNECTING A WIRE TO THE METAL FRAME.



7.2 - ELECTRIC FORCE

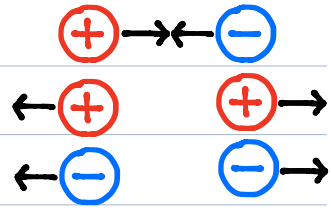
- A FORCE IS A PUSH OR PULL.



- ELECTRIC FORCE IS A NON-CONTACT FORCE BETWEEN TWO OBJECTS.
- THE STRENGTH OF THE ELECTRIC FORCE DEPENDS ON TWO THINGS:
  1) THE DISTANCE BETWEEN THE OBJECTS (FARTHER IS WEAKER; CLOSER IS STRONGER)
  2) THE AMOUNT OF CHARGE (MORE IS STRONGER; LESS IS WEAKER).

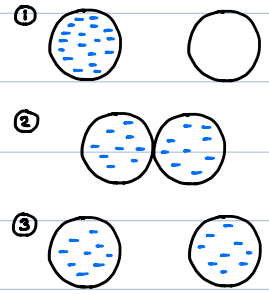
LAWS OF STATIC CHARGE

1. OPPOSITE CHARGES ATTRACT.
2. LIKE CHARGES REPEL.
3. NEUTRAL OBJECTS ARE ATTRACTED TO CHARGED OBJECTS.



CONDUCTION

- CONDUCTION IS THE PROCESS OF TRANSFERRING CHARGE BETWEEN OBJECTS BY TOUCHING.



INDUCTION

- CHARGED OBJECTS ATTRACTING NEUTRAL OBJECTS IS EXPLAINED BY INDUCTION.
- INDUCTION IS THE PROCESS OF REARRANGING ELECTRONS ON A NEUTRAL OBJECT BY BRINGING A CHARGED OBJECT CLOSE TO IT.