

Charges: The basis for electricity

Charges

- Occur when materials have too many or too few electrons
- Charge may be transferred between two materials when electrons move.
 - Like charges _____ ; opposite charges _____.

Charge is conserved

- Charge is developed by moving electrons (e-)
 - If One material loses e-, another gains e-
- If “ “ “ “ becomes positive, another becomes equally negative.
 - (total charge of any system does not change)

Charging

- May take place through:
 - Contact
 - e- physically moved from one place to another
 - Balloon on hair – example
 - Balloon gets e- from hair; becomes _____.
 - Induction

- e- pushed around due to electric field force
- Only in conductors or fluids (e- must move)

Gaining/Losing

- B&C, two neutral objects, are rubbed together. B loses 5 electrons to C.

– C's charge afterward: _____

– B's charge afterward: _____

- (atom joke)

Electric Field lines

- Represent invisible electric field that surrounds all charged objects.
 - Strength of field represented by proximity of lines.
- Direction of field lines' arrows represent the force on a positive test charge.
 - (examples: - , + , - + , + + , try out - -)
- Electric force is WAY stronger than gravity, but behaves similarly; depends on distance between objects and decreases with square of distance increase

Demonstrations

- Soda cans and charge rods – what is going on?

- (can is neutral – how is this possible?)
 - Balloon and water stream
 - (same as soda cans)
- Wimshurst machine and styrofoam / metal ball
 - Why the metal spray paint?