Electrical Nature of Matter

Vocabulary

-all matter is made up of tiny particles
-the electrons around the particles are free to move and as a result"rubbing" the article can make some of these electrons become displaced

Law of Electric Charges
"Like charges will repel each other, unlike charges will attract"

A Model for the Electrical Nature of Matter

1) All matter is made up of submicroscopic particles called atoms
2) At the centre of each atom is a nucleus, consisting of two kinds of particles, a positively charged proton and an uncharged neutron. Protons DO NOT move when the atom becomes charged
3) A cloud of negatively charged particles called electrons surrounds the nucleus
4) Like charges repel each other and unlike charges attract
5) In some atoms the electrons are held very loosely to the nucleus whereas in others they are held quite strongly
6) In each atom the number of electrons is equal to the number of protons
7) If an atom gains an electron it becomes a negative ion. If it loses an electron it becomes a positive ion

Vocabulary

Chap 9
discharge
conductor
insulator
electroscope
electrostatic series
ground
static electricity

Quiz 1

Chap 10
ampere
circuit
current
potential
ohm
resistance
volt

Quiz 2

Chap 11
efficiency
electrical energy
electrical power
joules
kilowatt
nonrenewable
sustainability

Quiz 3

Charging By Friction

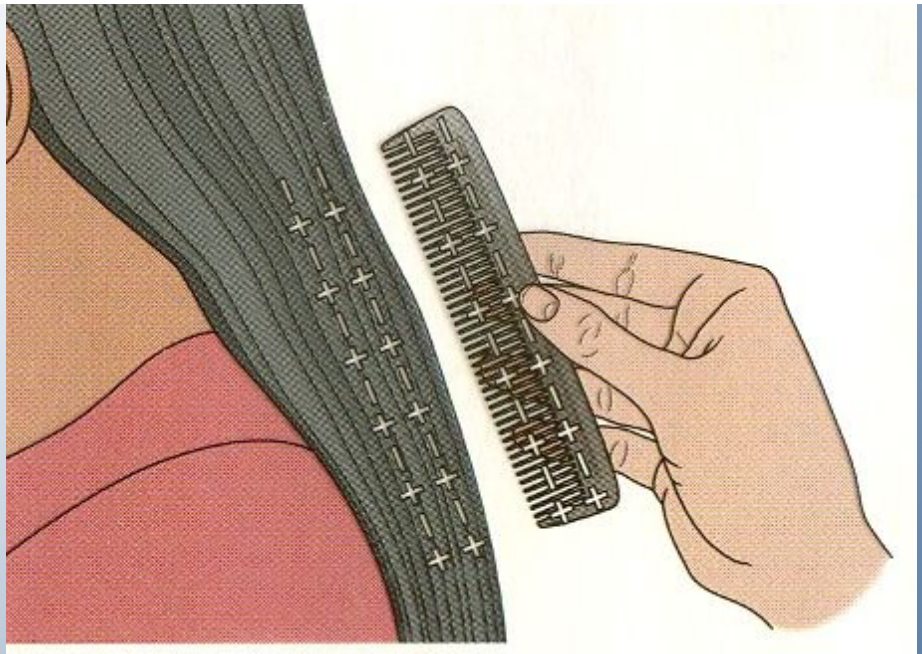
-protons are never moved during the charging
-all substances have a certain "hold" on their electrons

acetate
glass
fur
silk
aluminum
cotton
ebonite
polyethylene
rubber
silver

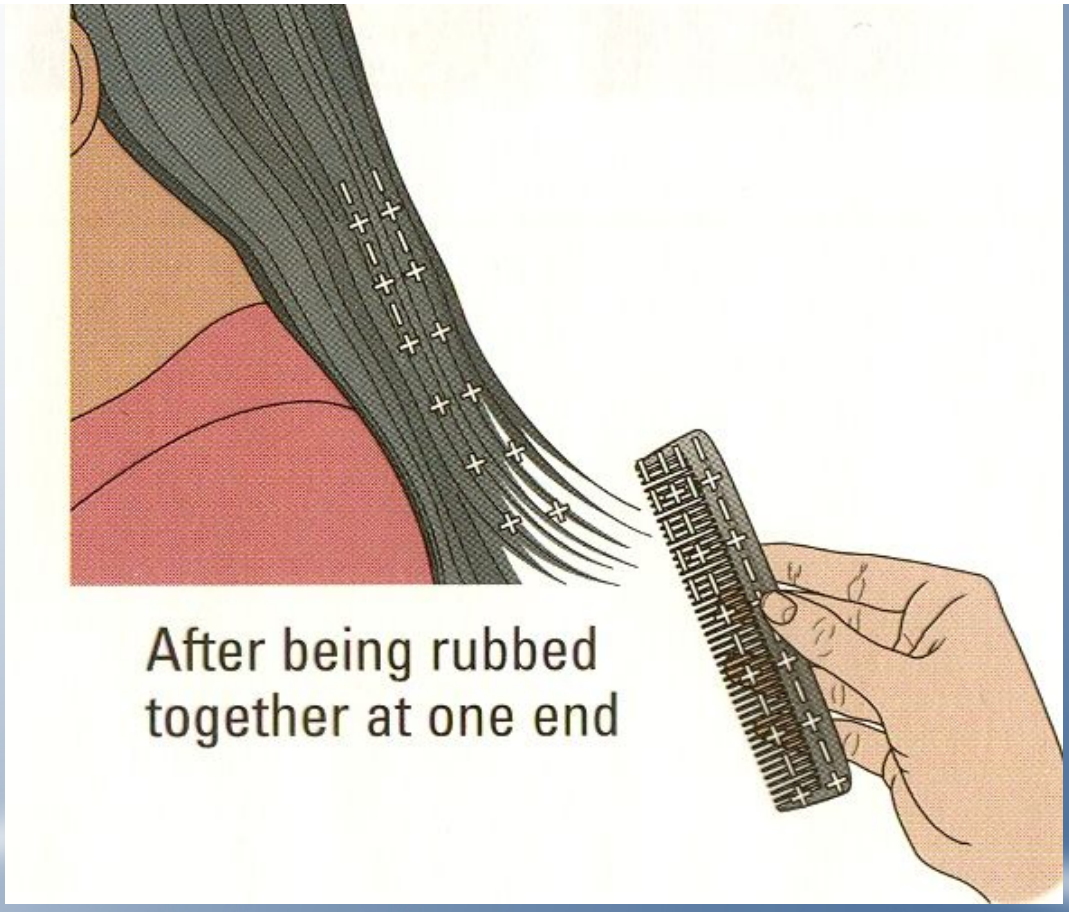
weak hold on e^-

strong hold on e^-

when two materials are rubbed together, the one that is 'higher' on the list becomes + and the one that is lower becomes -



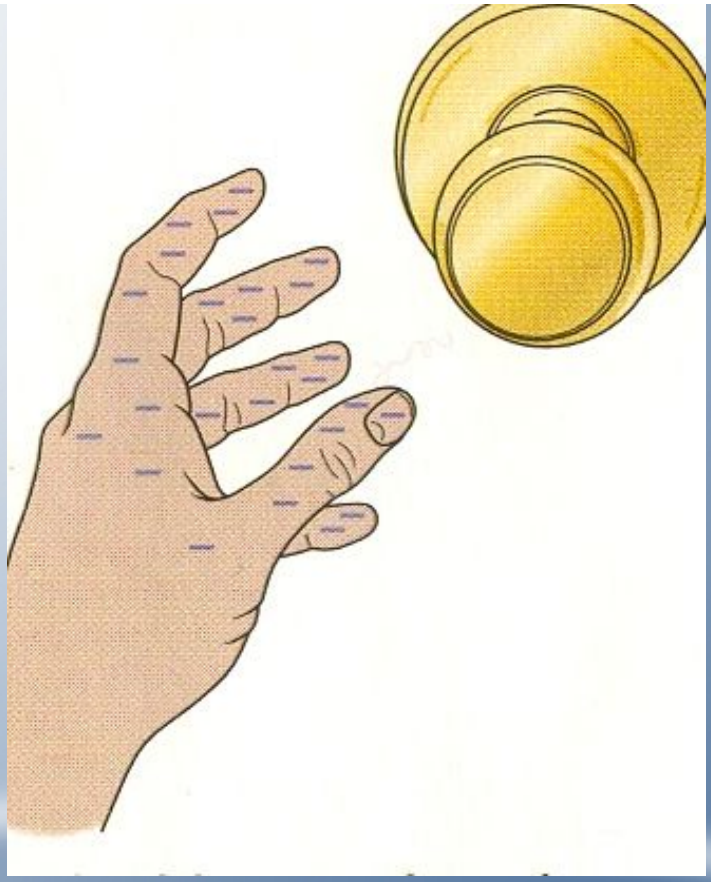
Before being rubbed together

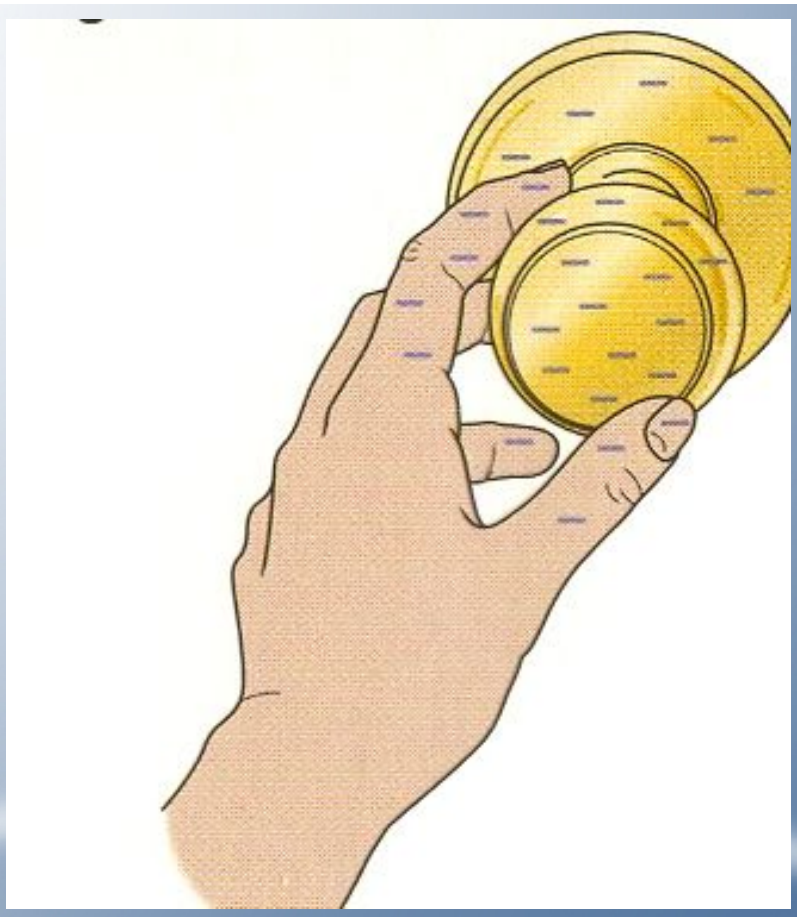


Transferring Charge by Contact

-charging by friction is difficult to avoid
-sometimes contact is not even made, the e jūmp

Consider two objects, not touching, one charged (-) and the other neutral





Insulators and Conductors

- *Insulators are any substance whose electrons are not free to move around easily*
- *In the event it does become charged, the charge tends to stay put.*
- *Ex: Wooden furniture, cars, airplanes*
- Conductors are any substance whose electrons are free to move easily
- Static charges never build up since the exces electrons are free to move around easily and eventually find their way off the material