

Types of Charging

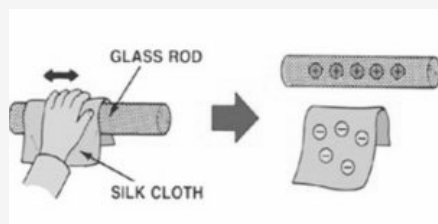
Charging by Friction

Charging by Conduction

Charging by Induction

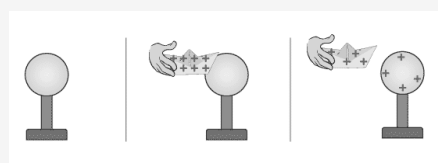
Charging by Polarization

Charging by Friction



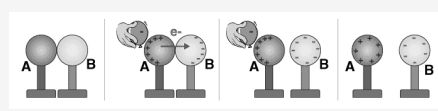
the transfer of electrons from one uncharged object to another by **rubbing** the two objects together. (Like hair and balloon)

Charging by Conduction



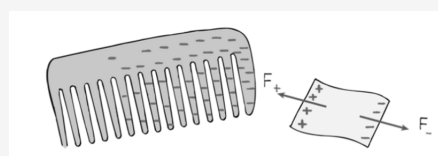
the transfer of electrons from one object to another by **direct** contact. (Like when you rub your feet on the carpet, but the charges move to your hands)

Charging by Induction



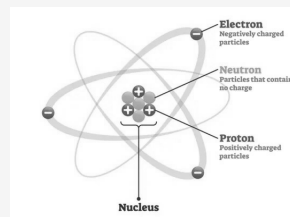
the transfer of electrons from charged object without touching the object itself (**indirect**). (Like When a computer monitor or television screen is turned on it begins to build up a charge)

Charging by Polarization

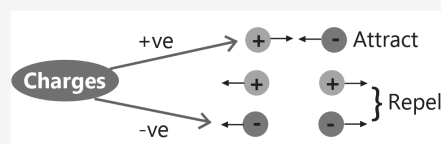


All the atoms or molecules near the neutral material become electrically polarized by **rearranging** when a charged object is

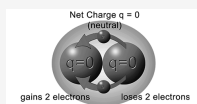
Atom: smallest unit of matter



Like charges repel, Unlike charges attract

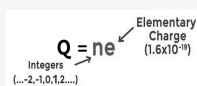


Conservation of Charge



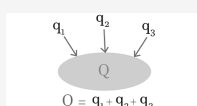
which means charge can neither be created nor be destroyed but can be transferred from one body to another

Quantization of Charge



which means that charge is a quantized quantity and is expressed as integral multiples of the basic unit of charge

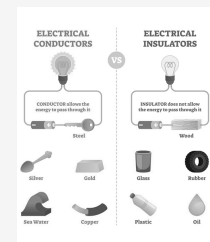
Additivity of Charge



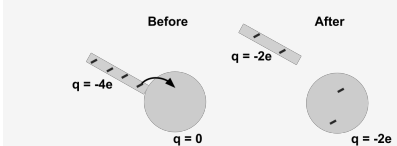
which means that if there are n number of charges present inside, The total charge present will be the algebraic sum of the individual charges

Coulomb's Law

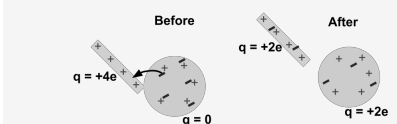
Materials Connectivity



How does an object get negatively charged?



How does an object get positively charged?



brought close. (Like a charged balloon when it is stuck to the wall)

The diagram shows the formula for Coulomb's Law: $F = k \frac{Q_1 Q_2}{r^2}$. Labels include: 'charge' for Q , 'unit of charge' for 'Coulomb', 'product of the two charges' for $Q_1 Q_2$, 'Newton' for the unit of force, 'magnitude of the force' for F , 'Coulomb's constant' for k , and 'distance between the charges squared' for r^2 . A small logo for 'How To Solve Crosswords' is at the bottom left.

Electric Force vs Gravitational Force

This diagram compares Coulomb's Law and the Universal Law of Gravitation. On the left, 'Coulomb's Law' is shown with the formula $F_e = k \frac{Q_1 Q_2}{r^2}$ and labels for electric force, charges, and distance. On the right, 'Universal Law of Gravitation' is shown with the formula $F_g = G \frac{m_1 m_2}{r^2}$ and labels for gravitational force, masses, and distance. A central vertical line separates the two, and a small globe is at the bottom center.



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