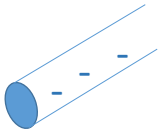
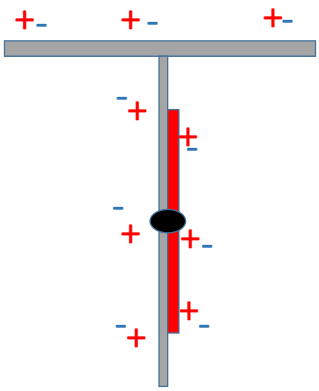
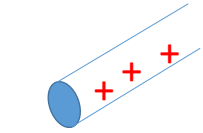
Movement of charges

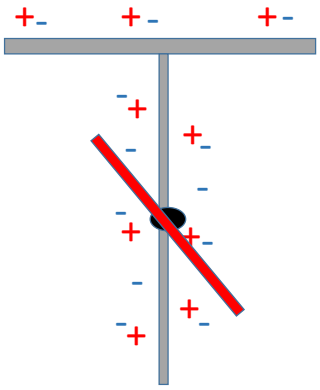
Movement of charges



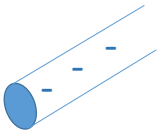


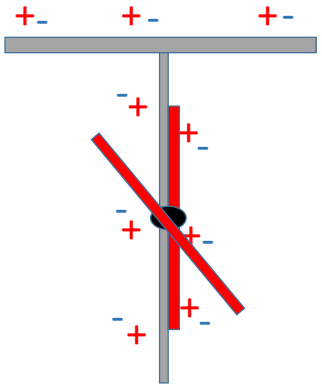
Movement of charges

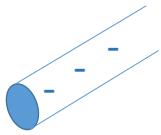


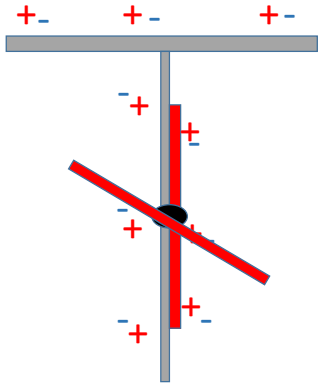


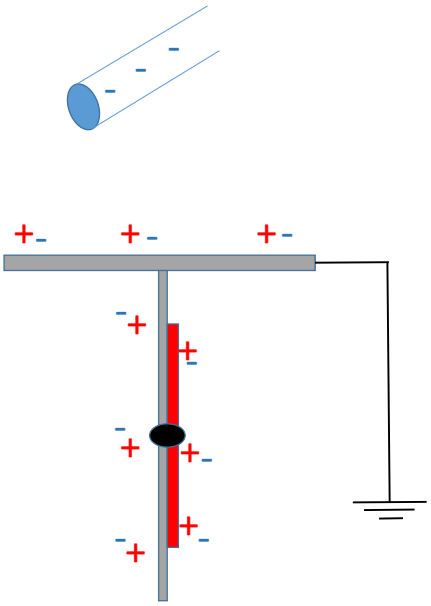
Electrostatic induction









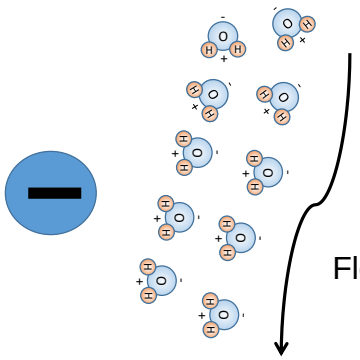


Through electrostatic induction we have given a permanent charge to an object without touching it.

Example:

Water is a dipole en has opposite charges on each side

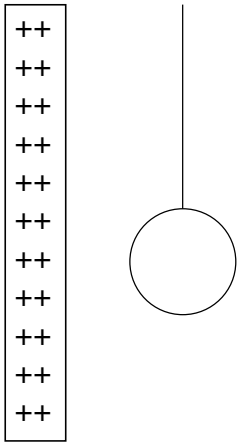
What happens when we approach with a negative charged PVC tube?



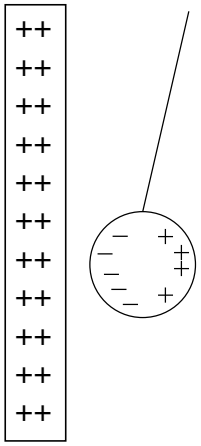
Flow of water

Here we have a neutral metallic sphere close to a positive charged object.

A)

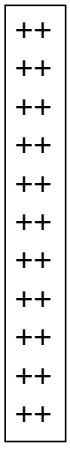


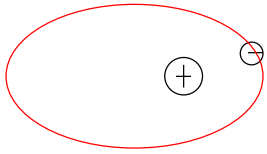
B)



The negative charges move to the left. They are more attracted compared to the positive charges because the negative charges are closer.

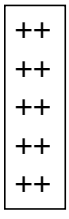
How can we attract neutral, non conductive paper strips with a charged object?

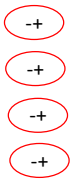




In this atom the orbit of the electron is warped toward the positive charge, creating a dipole.

What happens in the paper?

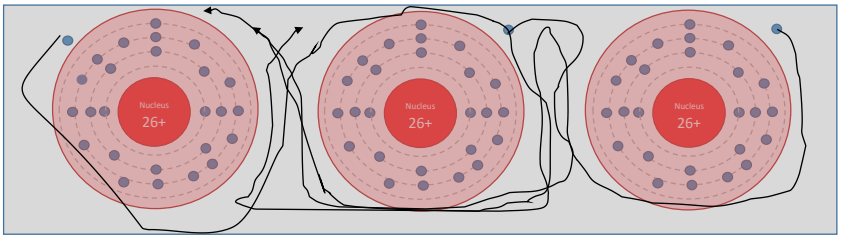


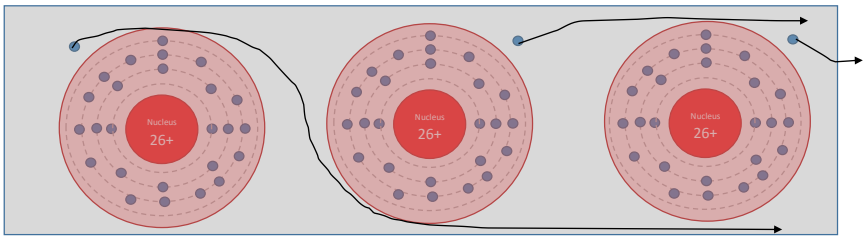


The atoms form dipoles and are attracted by the positive charge.

Conductors and insulators

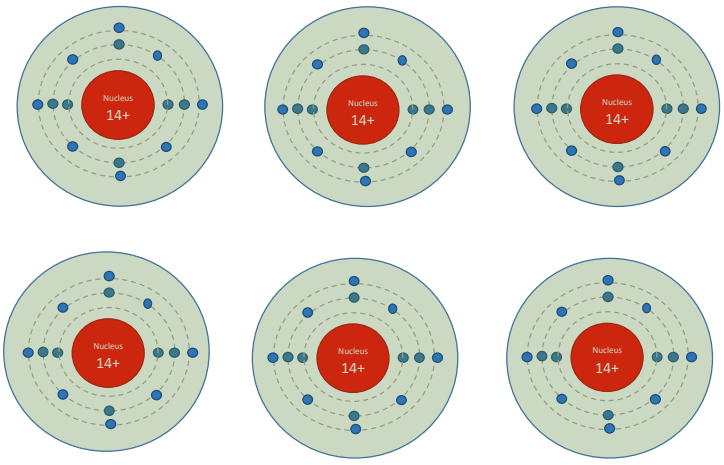
Conductor: electrons in outer layer: loosely bound, move around freely.





Conductors and insulators

Insulator: No loosely bound electrons. No free moving electrons.



Conductors and insulators: examples

Conductors

Iron
metals
Copper

Conductive plastics: polyacethylene

Nerve cell

Insulators

Rubber

Plastics

Ceramics