

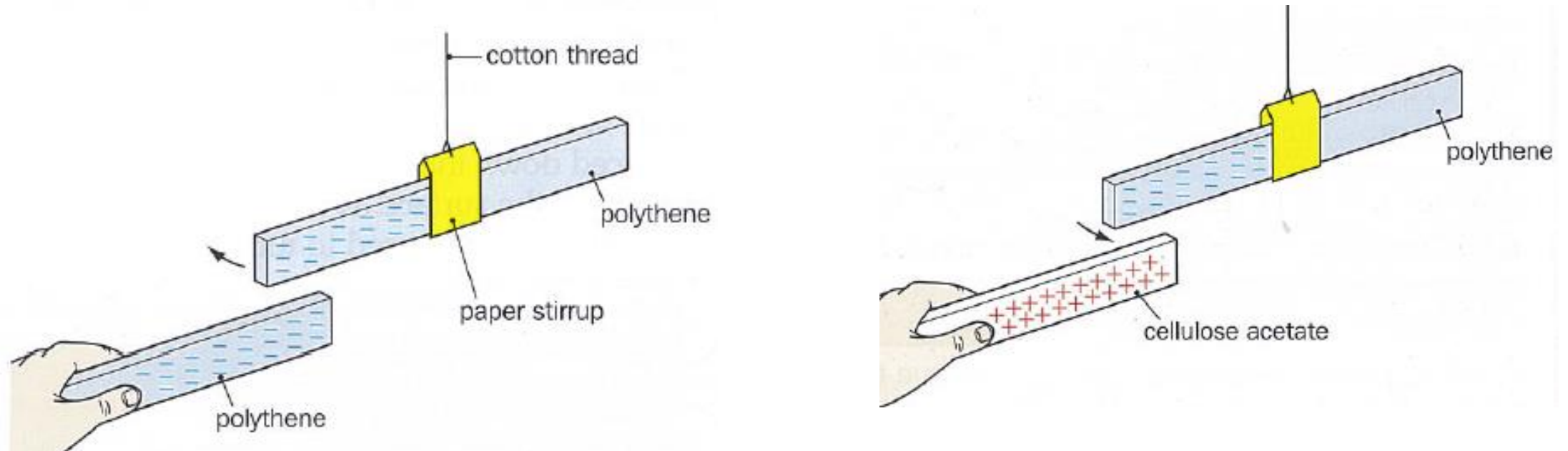
Electrostatics Term 3 Week 6

Background Notes

Objects are usually uncharged and so are electrically neutral.

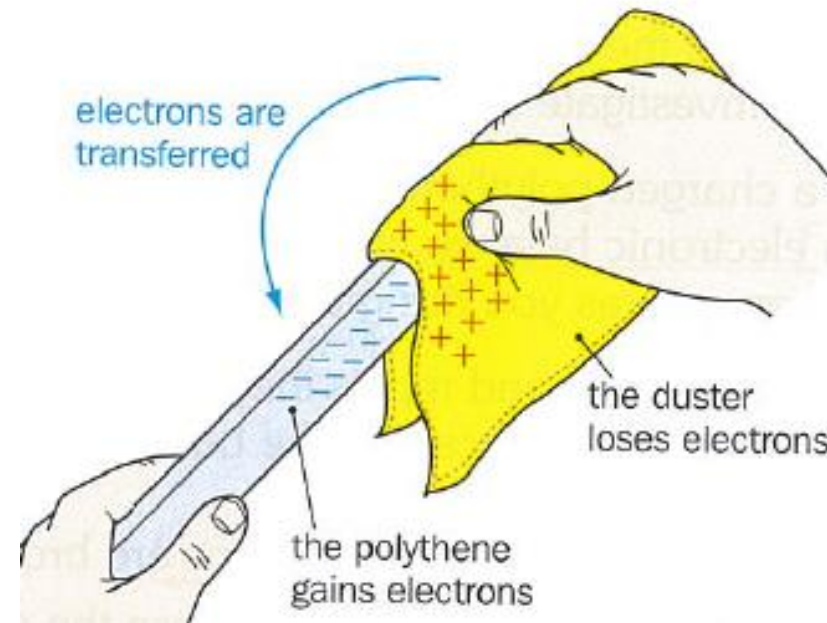
Objects can become charged by friction, when one material is rubbed against another material.

A charged object can attract an uncharged object, for example, small pieces of paper.



Charging occurs when *electrons are transferred* from one material to another.

Friction can transfer electrons

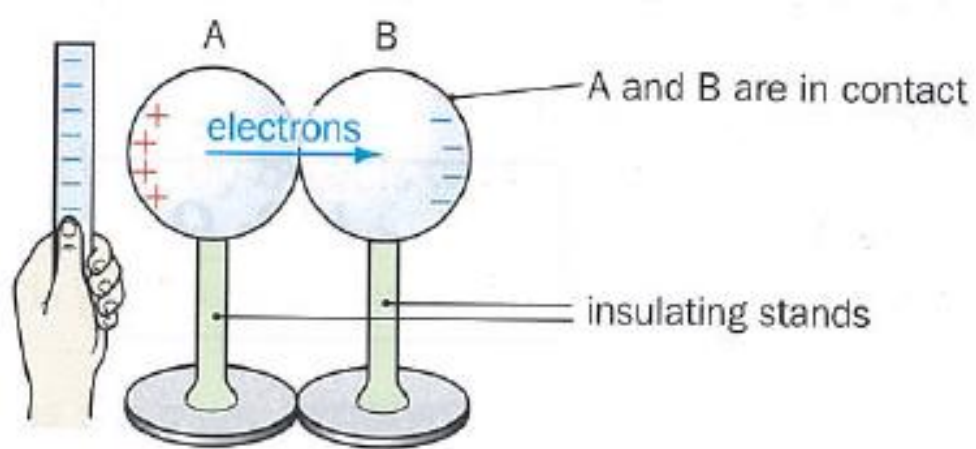


A conductor can only be charged if it is insulated from Earth.

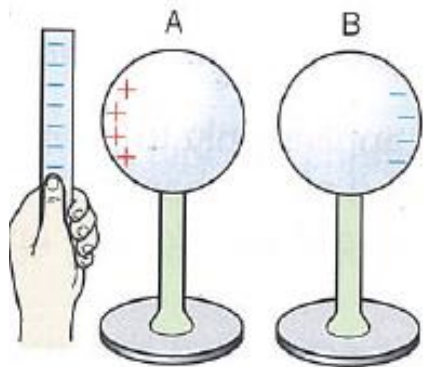
Charging by electrostatic induction

A charged conductor will share its charge with an uncharged conductor that is placed in contact with it. Electrons can flow between the two conductors because they are touching.

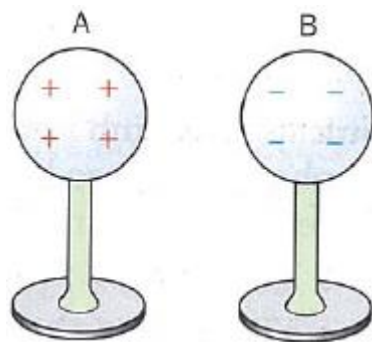
A charged strip can also be used to *induce* a charge in an uncharged conductor *without* touching it.



When a negative strip is brought close to 2 metal spheres, electrons from sphere A are repelled to sphere B.



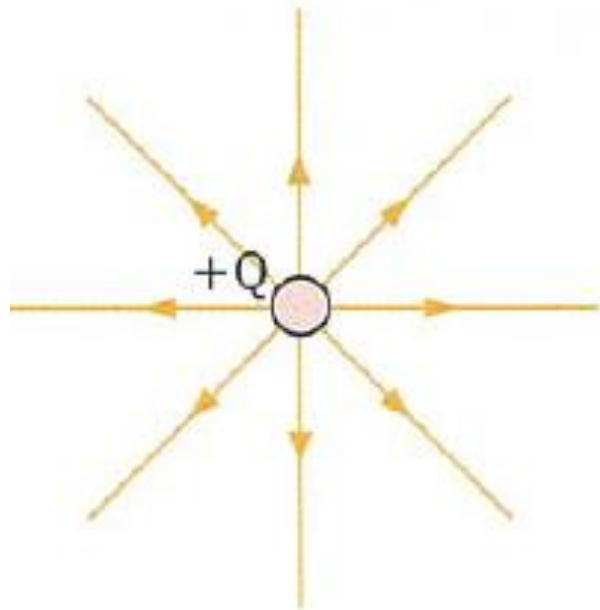
The spheres are separated with the strip still held nearby.



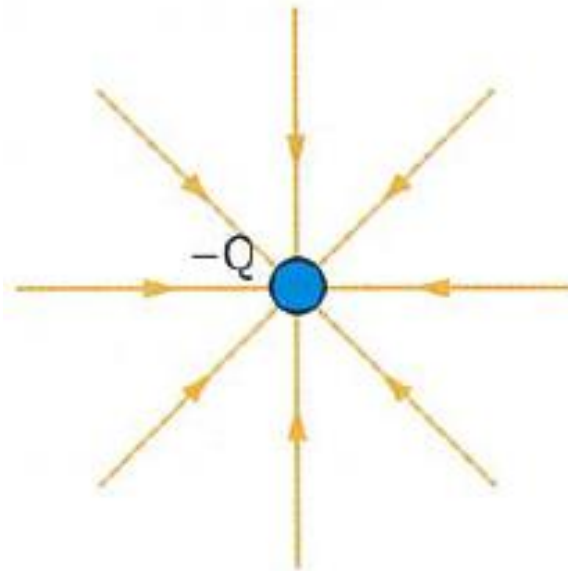
Then the strip is removed. The free electrons in each sphere now spread out, so that the charge is distributed evenly over the surface of each sphere.

Electric field strength E

The electric field strength at a point is the force per coulomb exerted on a positive charge placed at that point in the field.



This radial field
is repulsive



This radial field
is attractive

Electric Fields

The arrows on the field lines tell us the *direction* of the field.

This is defined as the direction of the force on a *positive* charge

The spacing of the lines tells us about the *strength* of the field.

Earthing

