# Physics 2: Life sciences and Environment

## Electrostatics

**EI-1 Charging by Induction**

A rod is charged negatively by rubbing it to cat fur. The rod is then brought near the cap of an electroscope causing the gold leave to diverge. The electroscope is polarized with the positive charge at near the cap and negative charge away from the cap. The cap of the electroscope is then earthed by touching it while the rod is still near it. Electrons will flow to earth. When the rod is then removed after the each connection removed, the electroscope will have a net positive charge.

**EI-3 Repulsion of Like Charges**

A charged rod is placed in contact with two pith balls hanging freely on strings. When in contact, the charges are transferred to the balls so both balls have the same net charge causing it to be repelled from the red and from each other.

**EI-4 The Capacitor**

The plates of the capacitor are brought into contact then it is charged by a 9V power. There is no deflection of the electroscope. The plates are then slowly brought further apart (separated) causing the gold leaf on the electroscope to deflect. This shows an increase in voltage and thus decrease of capacitance (C=Q/V). This shows an inverse relation of distance of separation with capacitance.

**EI-5 Visualisation of Electric Field Lines**

An electrode plate  is placed in a shallow glass dish containing semolina seed and castor oil. The electrodes are connected to a wimshurst machine which generate high voltages. The semolina align itself to the electric field lines.

**EI-8 Van de Graaff Generator (Lighting a Fluorescent Tube)**

A fluorescent tube is held near a van de graaff generator and it will light up showing the large electric field gradient generated. The voltage gradient is what cause the tube to light up.

**EI-10 Electric Pinwheel**

A pinwheel is placed on top of a Van de Graaff dome. The pinwheel will rotate. The points of the pinwheel will emit light as it ionise the air around it. Air is ionised because electric field is stronger at the points. The points and the ions have the same charge so it will repel each other.