

Static Electricity

◆ How Static Electricity is Produced

1. When two different objects that are insulators (such as a plastic rod and _____) are rubbed together, _____ move from one object to another.
2. One object becomes negatively-charged, and the other object becomes _____-charged.
3. The more rubbing the more electrons are transferred, and the larger is the _____ built up.
4. Unlike charges (positive and negative) _____ each other.

◆ Examples of Static Electricity include lightning and _____

Current Electricity

CURRENT ELECTRICITY

- ◆ Current Electricity or electric _____ is the movement of negatively-charged electrons through wires or objects made from metals, carbon or water.
- ◆ C _____ are substances that allow electrons to travel easily through them (e.g. _____, carbon and water).
- ◆ I _____ are substances that do not allow electrons to travel easily through them (e.g. _____, rubber and wood).

THE SIMPLE ELECTRIC CELL

- ◆ An electric cell consists of 2 different conductors (e _____) partly covered by an acidic or ionic solution (e _____ solution).
- ◆ Different combinations of electrodes produce _____ voltages. For example, electrodes of zinc and copper produce 1.1 volts, whereas electrodes of aluminium and carbon produce 2.4 volts.

Draw a labelled diagram of a simple electric cell.

- ◆ Rechargeable Cells (e.g. lead-acid cells) are cells that can be recharged when they go 'flat' by _____ the chemical reaction.
- ◆ Battery – A battery is a _____ of connected simple cells in series.

SERIES AND PARALLEL CIRCUITS

- ◆ Series Circuit - a circuit where the components are connected one after _____ into a 'circle'.
- ◆ Disadvantages of Series Circuits – As more light bulbs are connected in series, the brightness of all bulbs _____.
- ◆ Parallel Circuits are combined circuits where components such as light bulbs glow equally brightly. This form of wiring is used in household circuits.

Draw and label the following 2 circuits with a battery and 2 light bulbs in each:

SERIES CIRCUIT

PARALLEL CIRCUIT

AMMETERS AND VOLTMETERS

- ◆ Ammeter – This device is used to measure _____ in amperes (A). It must be wired into the circuit in _____.
- ◆ Voltmeter – a device for measuring _____ (or potential difference), and must be wired into the circuit in parallel.

HOUSEHOLD CIRCUITS

- ◆ **Fuse** – The fuse is a thin wire with a low _____ point near the power source to a house. It heats up readily and melts to disconnect the circuit to the house when _____. current flows. The fuse may ‘blow’ in the event of a power surge to the house, or due to a _____ electrical appliance in the house. A _____ serves a similar purpose.
- ◆ **Earth Wire** – All households must have a connection between the household wiring and the _____. This is to carry away any extra surge of electricity that may occur during thunder _____.
- ◆ **Electric Plug** – Most electric plugs have 3 connections – Active or ‘L_____’ (brown), N_____ (blue) and E_____ (green/yellow). However, appliances with plastic exteriors do not always have the third earth connection.
- ◆ **DC (Direct Current)** – Direct current is a current in which electrons continually flow in the _____ direction. It is produced by _____.
- ◆ **AC (Alternating Current)** – Alternating current is a current of electrons in which the direction of movement of electrons is continually changing. It is the type of current in _____ circuits.

3 METHODS OF ELECTRICITY GENERATION

- ◆ **Using Chemical Reactions in Simple Electric Cells** – The chemical potential energy of the electric cell is converted to _____ energy.
- ◆ **Using Light in Solar Cells** – Solar or _____ cells are made of elements such as silicon which readily free _____ when exposed to sunlight energy. The light energy is converted into electrical energy.
- ◆ **Using Magnets inside a Coil of Wire** – Moving a magnet through a coil of wire causes the electrons to flow through the _____. This is called the electromagnetic effect or _____. Moving the magnet in the opposite direction causes the current to _____. To increase the current, one can increase _____.

the _____ of the magnet, the number of turns in the coil, or the _____ of movement of the magnet.

STEP-UP AND STEP-DOWN TRANSFORMERS

- ◆ A transformer consists of two coils of wire, the primary and the _____ coil, mounted on the same iron core. Alternating current passing through the primary coil induces a current in the secondary coil.
- ◆ A step-up transformer is one with a smaller number of turns in the _____ coil and a large number of turns in the _____ coil. This increases the current, and is used to boost mains electricity supply over the long distances from the power station to our homes.
- ◆ A step-down transformer has more turns in the primary coil than the secondary coil. Current is induced in the secondary coil, but the voltage is decreased. This occurs when the _____ volts used in our homes is connected to a child's appliance such as an electric piano or an electronic game.