

## Class X, Physics

## Chapter: Electricity

Topic	Common slips	How to avoid them!
Direction of flow of current	Confusion between:  Direction of flow of current AND direction of movement of electrons.	The direction of current is opposite the direction of movement of electrons.  In a circuit, current always flows from the positive to negative terminal and you need to put arrows in this direction.
Units	Confusion in the use of symbols: is ampere written as A or amp?	The symbol for ampere is <b>A</b> and not amp. You could also use "ampere" instead of "A".
Formula	$V=W/Q$ is often remembered, wrongly.	Make sure you memorise this formula, correctly.
Graphs	In questions, where you have to check the resistance from the graph, see what is plotted along the x and y axis.	If <b>V</b> is plotted along y axis and <b>I</b> is plotted along x axis then the slope of the graph gives <b>R</b> .  If <b>V</b> is plotted along x axis with <b>I</b> along the y axis then the slope of the graph gives <b>1/R</b> .
Resistivity	The reason why alloys are used to make elements of electric irons and heaters <b>is not</b> because they are insulators.	Had the alloys been insulators then current would not flow at all. We want current to flow in these devices as well as heat up the wire, so we cannot use a very good conductor like copper, aluminium etc and the best choice is to use an alloy that has a high resistivity.
Change in resistance	If a wire is folded (doubled) and is now half its original length, then the resistance does not become half.	Remember: the area of cross-section also becomes double, so the new resistance is $1/4^{\text{th}}$ the old resistance.  If the length of the wire was made $1/3^{\text{rd}}$ by folding it, then new resistance will be $1/9^{\text{th}}$ the original.  If the length of the wire is made $1/4^{\text{th}}$ , then the new resistance is $1/16^{\text{th}}$ the original.

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		Can you see the pattern?
Resistors in series	Is the current or the voltage same in resistors in series?	<p>The current is the same. Current that starts from one end of the resistors will continue to flow through all resistors that are joined one after the other. It can't disappear all of a sudden?</p> <p><i>Here's a way to remember this fact:</i> Think of the resistors as bridges. If the bridges are in series one after the other and the current is the cars that move on the bridges, then once the cars start moving, the same number of cars will move through all bridges.</p> <p>As there are no alternative routes, the number of cars crossing the bridges, is the same. Similarly the same current flows through resistors joined in series.</p>
Power	When to use power = VI and when to use power = $V^2/R$ ?	<p>If the power drawn from a source is to be found then use <math>P = VI</math>.</p> <p>If power dissipated in a resistor is to be found then use <math>P = V^2/R</math>.</p>
Unit	What is 1 unit? Is it 1kW or 1kWh?	It is a unit of energy and not of power. So 1 unit refers to 1kWh or $3.6 \times 10^6$ J.
Terms to define	Confusion between overloading and short-circuiting	<p><b>Overloading</b> refers to drawing more current than the wire is designed to carry. In this case the wires can become hot, or burn. For example if you use extension cords and adapters and run a hair dryer, toaster and let's say mixie, all using the same plug point, it is quite likely that you are overloading the circuit.</p> <p><b>Short circuit</b> refers to a fault when the live wire and neutral wire come in contact with each other. It is an abnormal low resistance connection between two points of an electric circuit that are meant to be at different voltages.</p>

		For example a short circuit is to connect the positive and negative terminals of a cell with a piece of conducting wire. The wire becomes hot and the cell discharges very rapidly.
Ohm's Law	How to remember the correct form of the equation?	Here's a memory mnemonic: "Iyer, is a common name and so it is $V = IR$ (doesn't this sound like Iyer?!)"
Power	While solving numericals make sure you do all the steps, if you are given power and number of hours of use, and you have to find cost.	Once total consumption is found, cost is found by multiplying the units consumed with the cost per unit.  At times you forget to do the last step losing crucial marks in the process.

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