



A Level Physics Online

Eduqas Physics – Component 2

Module 2: Resistance

This topic covers the relationship between current and potential difference and develops the ideas of resistance and resistivity. The heating effect of an electric current is explored and the variation of resistance with temperature of metals is investigated.

You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
The definition of potential difference				
The idea that potential difference is measured in volts (V) where $V = \text{J C}^{-1}$				
The characteristics of $I - V$ graphs for the filament of a lamp, and a metal wire at constant temperature				
Ohm's law, the equation $V = IR$ and the definition of resistance				
Resistance being measured in ohms (Ω), where $\Omega = \text{V A}^{-1}$				
The application of $P = IV = I^2R = V^2/R$				
Collisions between free electrons and ions gives rise to electrical resistance, and electrical resistance increases with temperature				
The application of $R = \frac{\rho l}{A}$, the equation for resistivity				
The idea that the resistance of metals varies almost linearly with temperature over a wide range				
The idea that ordinarily, collisions between free electrons and ions in metals increase the random vibration energy of the ions, so the temperature of the metal increases				
What is meant by superconductivity, and superconducting transition temperature				
The fact that most metals show superconductivity, and have transition temperatures a few degrees above absolute zero (-273°C)				
Certain materials (high temperature superconductors) having transition temperatures above the boiling point of nitrogen (-196°C)				
Some uses of superconductors for example, MRI scanners and particle accelerators				
SPECIFIED PRACTICAL WORK				
Investigation of the $I - V$ characteristics of the filament of a lamp and a metal wire at constant temperature				



You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
Determination of resistivity of a metal				
Investigation of the variation of resistance with temperature for a metal wire				

