

HSC Physics

Week 2

Summary Notes

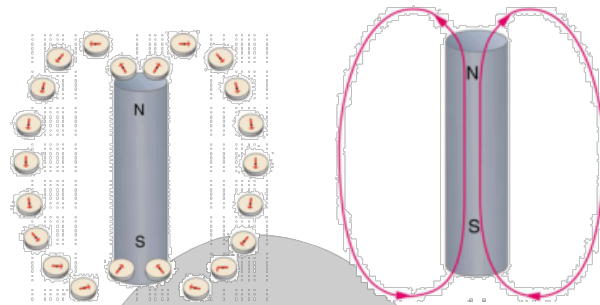
Name:

Class:

Tutor:

Analyse the interaction between charged particles and uniform magnetic fields, including: (ACSPH083)

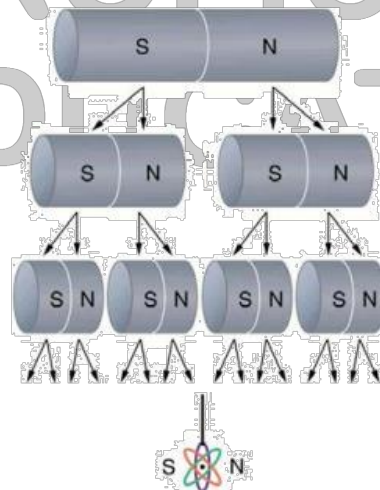
- Magnetic field B is a **vector** quantity Tesla the direction of flowing out from **north** pole into **south** pole to form a **continuous** closed loops



- The strength of the field is proportional to the **closeness** or **density** of the field lines.



- North and south poles always occur in **pairs** there is no such things called **monopole**



Current create magnetic fields

In Oersted’s experiment the magnetic field due to the current exerts a force on the magnetic field of the compass.

- Moving **charge** (current) or a permanent magnet will create magnetic field around them to exert force on other magnets or moving charge

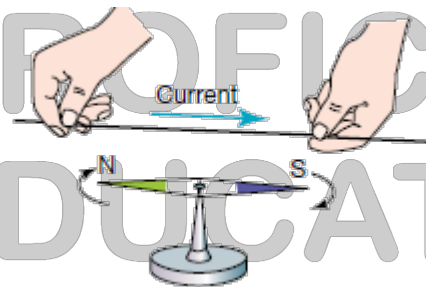
$$B = \frac{\mu_0 I}{2\pi r}$$

μ_0 : permeability of free space ($4\pi \times 10^{-7} T m A^{-1}$)

I : current (A)

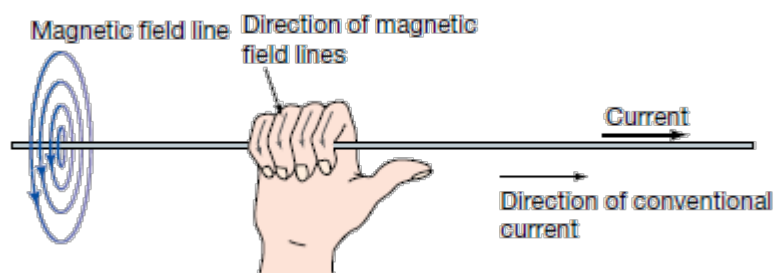
r : perpendicular distance from the wire (m)

Use SI units (tesla, metres, amperes)

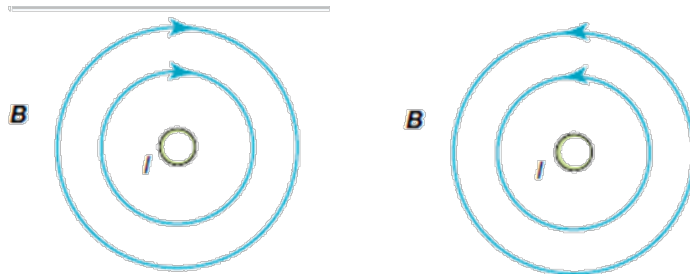


Right-hand grip rule

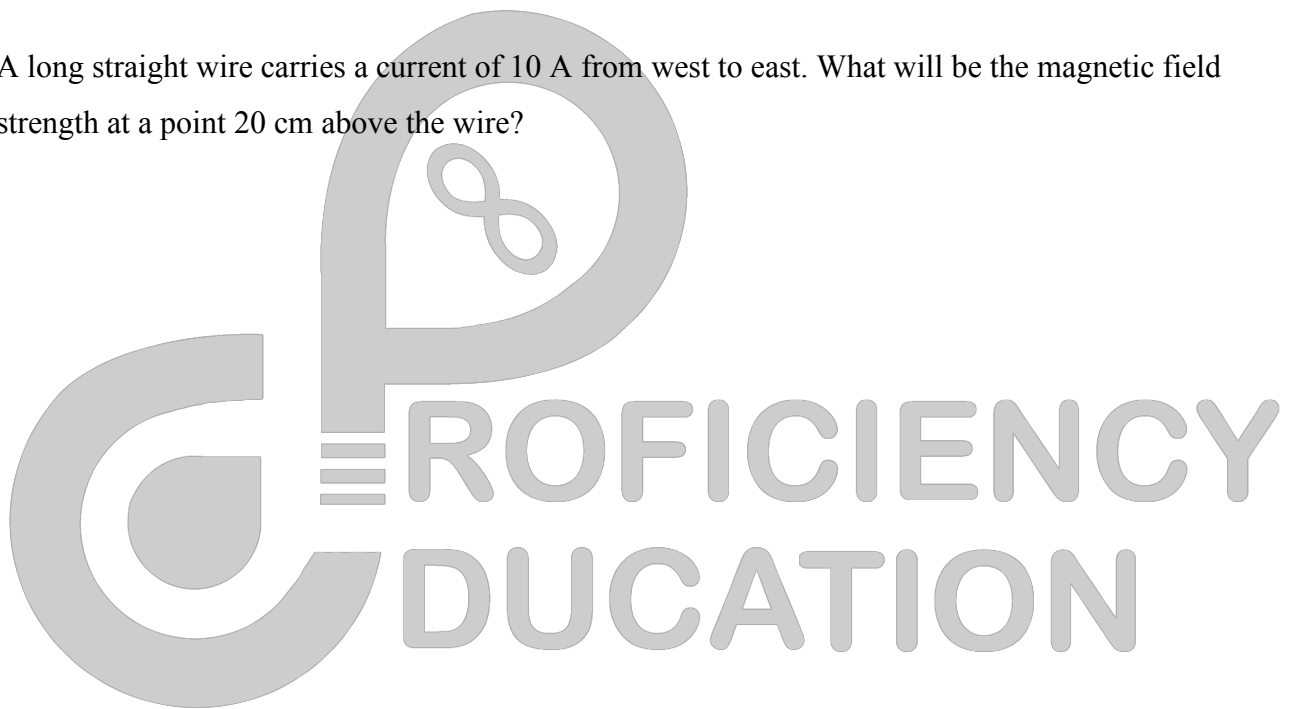
Grip the wire with the right hand, with the thumb pointing in the direction of the **conventional current** and the fingers will curl around the wire in the direction of the magnetic field.



Indicate the direction of the current



A long straight wire carries a current of 10 A from west to east. What will be the magnetic field strength at a point 20 cm above the wire?



**Enrol at Proficiency Education to gain access
to unlimited printing of our extensive notes!**