$$\Rightarrow \frac{\mu}{\mu_0} = (1 + \chi)$$

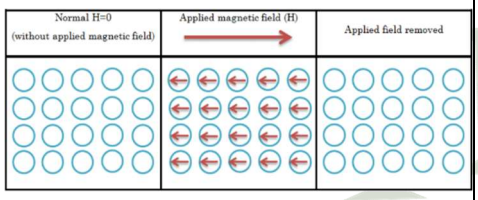
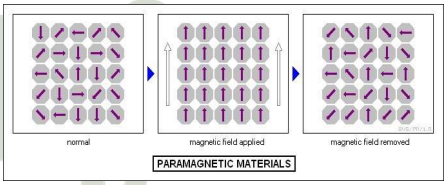
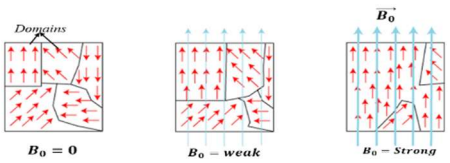
$$\boxed{\Rightarrow \mu_r = (1 + \chi)}$$

This is the required relation between relative permeability & magnetic susceptibility.

Classification of magnetic substance. (Imp)

Magnetic substances are divided into three categories, i.e.

1. *Diamagnetic Material*
2. *Paramagnetic Material*
3. *Ferromagnetic Material*

Diamagnetic Material	***Paramagnetic Material***	***Ferromagnetic Material***
Such type of magnetic material which are feebly (weakly) magnetized in a direction opposite to that of applied magnetic field.	*Such type of magnetic material which are feebly (weakly) magnetized in the same direction of applied magnetic field.*	*Such type of magnetic material which are strongly magnetized in the same direction of applied magnetic field.*
They are feebly repelled by a magnet.	*They are feebly attracted by a magnet*	*They are strongly attracted by a magnet.*
They loss their magnetic properties on removal of external magnetic field.	*They loss their magnetic properties on removal of external magnetic field.*	*They do not lose their magnetic properties on removal of external magnetic field.*
The magnetic properties of diamagnetic substances is independent to the temperature. (Does not follows curie law)	*The magnetic properties of paramagnetic substance decrease with increase in temperature. {Follows Curie law i.e. ($\chi \propto \frac{1}{T}$)}*	*The magnetic properties of ferromagnetic substance decrease with increase in temperature. {* (Follows Curie-Weiss law: $\chi \propto \frac{1}{T-T_c}$}
Relative permeability: $0 \leq \mu_r < 1$, less than one	*Relative permeability: Slightly greater than one.*	*Relative permeability: $\mu_r >> 1$*
Susceptibility: $-1 \leq \chi < 0$	*Susceptibility: Positive and small*	*Susceptibility: $\chi >> 1$*
		
e.g. Antimony, Bismuth, Copper	*e.g. Magnesium., Aluminum*	*e.g. Iron, Cobalt, Nickel*

Curie law:

The Intensity of magnetization (I) of paramagnetic substance depends on the magnetic induction (B_0) produced by the magnetizing field H in free space and absolute temperature (T) of the material,
i.e.

$$I \propto B_0 \text{---------(1)}$$

$$I \propto \frac{1}{T} \text{---------(2)}$$

Combining eq. (1) and (2)