

O Level Physics

Tutorial 17: Magnetism

Syllabus :

(a) state the properties of magnets

1. State the properties of magnets on the following:
 - (i) action on iron, steel, cobalt or nickel,
 - (ii) number of poles,
 - (iii) action between poles on different magnets,
 - (iv) orientation of magnet freely suspended in a horizontal direction.

(b) describe induced magnetism caused by placing magnetic material close to a strong magnet or within a current-carrying solenoid

2. Iron, nickel and cobalt are examples of magnetic material. This means that they can be attracted by a magnet, but they may or may not be a magnet themselves.

Soft iron is a form of iron that contains little carbon, has high relative permeability, is easily magnetised and demagnetised.

- (a) The north pole of a magnet is used to stroke a soft iron bar repeatedly in the same direction a number of times. What happens when the iron bar is then brought close to some iron powder?
- (b) An insulated electric wire is coiled round an iron bar a number of turns. The wire is connected to a battery and an electric current flows through it. What happens when the iron bar is then brought close to some iron powder?

(The soft iron bar loses its magnetism when the electric current is switched off. A magnet that behaves this way is called a temporary magnet.)

(c) distinguish between temporary magnets (e.g. iron) and permanent magnets (e.g. steel) in terms of their properties and uses

3. State one use of a temporary magnet, and one use of a permanent magnet.

(d) describe how a bar magnet (e.g. a compass) can be used to determine the direction of a magnetic field

4. (i) Describe how a compass can be used to determine the direction of a magnetic field.
- (ii) Sketch a picture to show how a small compass can be used to map out the magnetic field pattern around a bar magnet.

(e) Draw the magnetic field pattern around a bar magnet and between the poles of two bar magnets.

- 5 (i) Draw the magnetic field pattern around a bar magnet.
- (ii) Draw the magnetic field pattern around the poles of two bar magnets.

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