

9.1 – 9.4 Magnetic Field Introduction / Review

Magnets

- naturally occurring lodestones
- artificially created – horseshoe magnet, bar magnet, circular magnets. ‘permanent’ if not damaged.
- moving charge (in a straight conductor, or in a coiled conductor) creates a magnetic field when the current is running. (electromagnet – can turn on/off).

Domains

Electrons spin, and thus are moving charge. Moving charge sets up magnet poles. In some metals, electrons are not paired, and thus their magnetic field is field. These metals can be magnetized ie: iron, nickel and cobalt. (RHR #2)

Non-contact forces

→ Just like gravity and electrostatic forces, magnetic forces are non-contact forces and are felt over a distance. You can map the ‘field of influence’ for these forces, just like you can map electric fields.

Indicator & direction

Gravity – the indicator in a gravitational field is a mass – direction is attraction only.

Electrostatic – indicator is always a positive test charge (qt) – direction is attraction and repulsion

Magnetic – indicator is north needle of a compass – direction is attraction and repulsion.

Seatwork / Review

9.1 – Another Force at a Distance

- Distinguish between magnetic and gravitational force
- Distinguish between magnetic and electric force
- What 2 things do all 3 forces have in common?

9.2 Domain theory

- Define ‘domain’ and ‘dipole’.
- Copy the ‘Domain theory’. Be able to use it to explain all the observations in Table 9.1
- Note the ‘Law of Magnetic Forces’.

9.3 Mapping Magnetic Fields

- what is the ‘test’ entity when mapping magnetic fields? _____ Convention says that lines flow from _____ to _____.
- Familiarize yourself with Fig. 9.7 – it is very helpful!
- Be able to sketch magnetic field maps. ie: Fig. 9.8 a,b,c.

9.4 Artificial Magnetic Fields (RHR #1, RHR #2)

- What did Oersted discover?
- Magnetic Character revisited. Moving charge creates magnetic dipoles. At the atomic level, what causes magnetic dipoles?
- Coiled Conductors = solenoid. Sketch 9.15 a and 9.15 b
- What is an electromagnet?
- Be familiar with RHR #1 and RHR #2 – know how they work.
- What affects the strength of an electromagnet? (several things....)
- Understand how a ‘lifting electromagnet’ and an ‘electric bell’ works.

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