

Physics 12 Electromagnetic Force Worksheet 1

Name: _____

$$F = Bqv \sin$$

$$F = BIL \sin$$

1. Calculate the force on an electron travelling through the magnetic field of 0.003 Tesla (typical fridge magnet) at 500 m/s perpendicular to the field.

The charge on an electron can be found on your data sheet, and is listed at the elementary charge, $1.6 \times 10^{-19} \text{ C}$

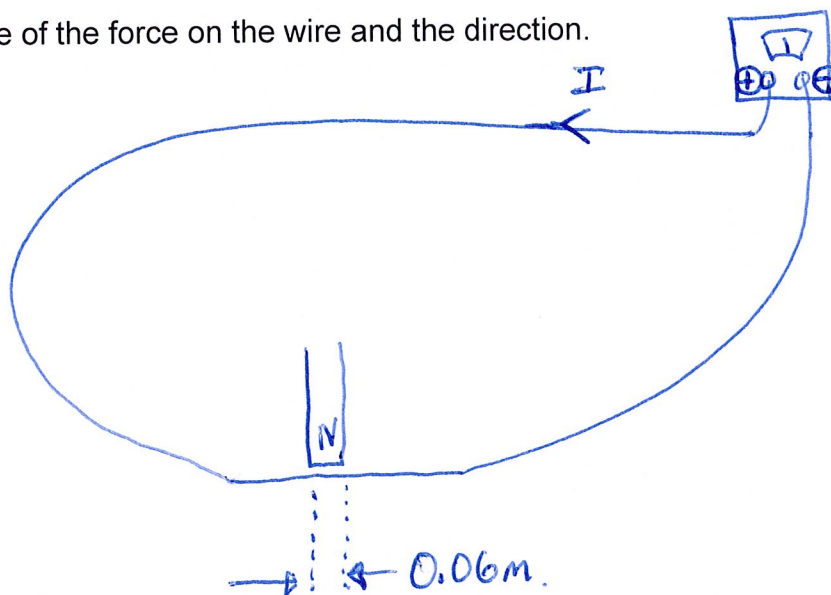
2. Calculate the acceleration of this electron. The mass of an electron can be found on your data sheet.

3. Calculate the force on a proton travelling at 100 m/s near a rare earth neodymium magnet (B field is 1.1 Tesla).

The charge on a proton is the same size as the charge on an electron.

4. A wire carries a current of 4 A and passes through a magnetic field of 0.9 T.

Find the size of the force on the wire and the direction.



5. a) Find the force on the loop of wire that carries a 0.2 A current and passes through a 1.1 Tesla field perpendicular to the loop.

$$C = 2\pi r$$

$$r = 0.02 \text{ m}$$



b) How many wraps do you need to generate a 5 N force?

6. The Earth's magnetic field is approximately 3×10^{-5} Tesla. How large is the magnetic force on a 32 m wire between two telephone poles that carries 1.6 amp of current?

