

12 Magnetic fields and forces – Part 1

—Answers

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Work through these after you have tried the questions yourself.

2.1 you get two smaller magnets, each with its own north and south pole (poles always come in pairs).

2.2 $F = qvB = 2.0 \times 10^{-19} \times 1.0 \times 10^5 \times 0.40 = 8.0 \times 10^{-15} \text{ N}$.

2.3 $F = BIL = 0.10 \times 3.0 \times 0.50 = 0.15 \text{ N}$.

2.4 the force is at right angles (perpendicular) to the velocity.

2.5 the magnetic force is $F = qvB \sin \theta$, and moving along the field means $\theta = 0$, so $\sin \theta = 0$ and the force is zero.