

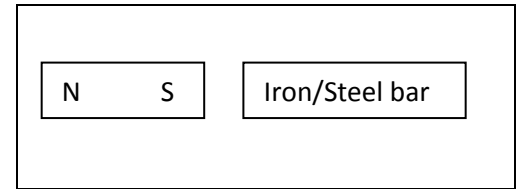
## Magnets and Currents review questions

### 1) Induced Magnetism

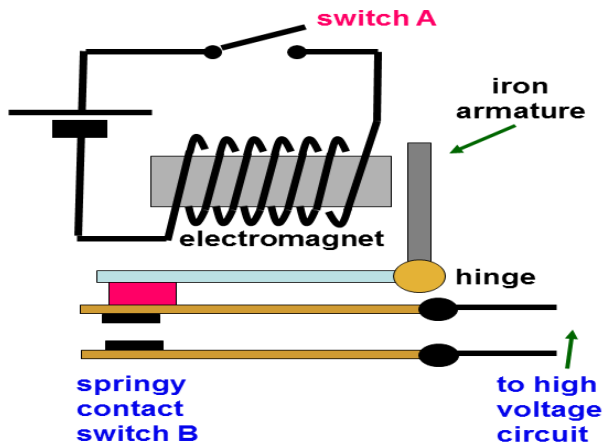
A magnetic field will only have an effect on a material that has magnetic properties.

(a) If either an iron or a steel bar is brought near a strong magnet it will be magnetised by induction. If a bar is brought near to the South pole of a magnet as shown in the diagram explain:

- What will happen in the bar to some of its atoms,
- The effect of this on the bar and the resulting forces.



(b) In what way will an iron bar and a steel bar react differently after the magnet is removed?



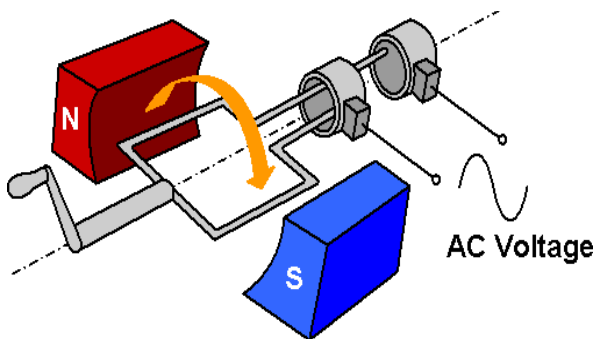
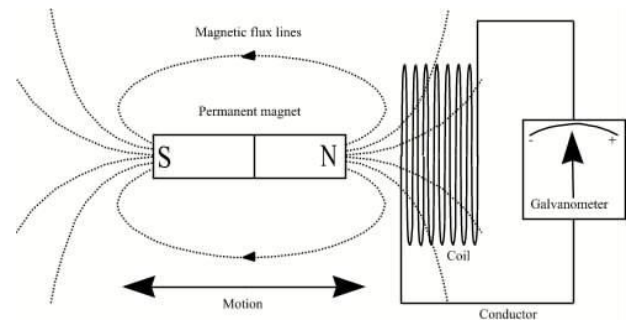
### 2) Types of magnet

- Explain the difference between a solenoid, an electromagnet and a permanent magnet.
- Explain what will happen when switch A in the circuit on the right is pressed.
- Explain how a magnetic compass works and how it could be used to detect current flowing in a wire.

### 3) Electromagnetic induction

Look at the diagram on the right

- What will happen to the needle on the galvanometer as the magnet is moved towards and the away from the coil?
- Explain why there will be no current induced if the magnet is stationary inside the coil



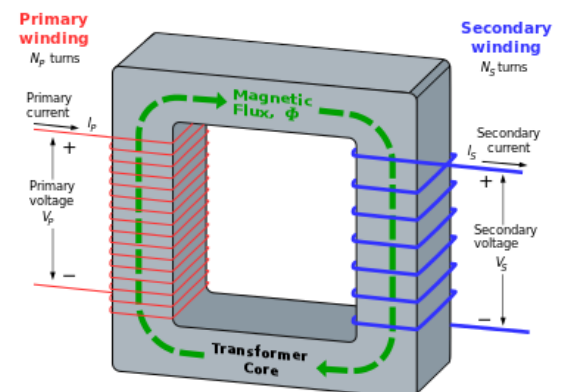
### 4) AC generator

The diagram on the left shows a simple demonstration AC generator

- Explain why the current generated is AC
- If the handle was turned faster more voltage would be induced in the wires. State two changes to the **design** of the generator that would result in an increase of voltage.

### 5) Transformer

- What material is the core of a transformer made from?
- A 100% efficient transformer has 160 input coils and 80 output coils. If the input voltage is 12V AC and the current is 2A. Calculate:
  - The output voltage
  - The power
  - The output current



### 6) Magnetic fields from currents

Sketch the field patterns when current flows through:

- a straight wire
- a solenoid.