

WJEC England GCSE Physics

8.2 - Magnetic Effects of Currents and the Motor Effect

Flashcards

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What is produced when current flows through a conducting wire?



What is produced when current flows through a conducting wire?

A magnetic field is produced around the wire.



What determines the strength of the magnetic field around a current-carrying wire?



What determines the strength of the magnetic field around a current-carrying wire?

- The magnitude of the current flowing through the wire.
 - The distance from the wire.



What is a solenoid?



What is a solenoid?

A coil of wire which when current passes through creates an induced magnetic field.



Describe the magnetic field found inside a solenoid.



Describe the magnetic field found inside a solenoid.

Strong and uniform.



What is an electromagnet?



What is an electromagnet?

- A solenoid with an added iron core.
- Adding the iron core increases the strength of the magnetic field.



What is the motor effect? (Higher)



What is the motor effect? (Higher)

When a force is exerted between a magnetic field and a current-carrying conductor placed in that field.



What rule is used to determine the force experienced due to the motor effect?
(Higher)



What rule is used to determine the force experienced due to the motor effect? (Higher)

Fleming's Left-Hand Rule



When using Fleming's left hand rule
what does the forefinger represent?
(Higher)



When using Fleming's left hand rule what does the forefinger represent? **(Higher)**

The direction of the magnetic field.

(First finger = field)



When using Fleming's left hand rule
what does the second (middle) finger
represent? **(Higher)**



When using Fleming's left hand rule what does the second (middle) finger represent? **(Higher)**

The direction of current flow in the conductor.

(Second finger = current)



When using Fleming's left hand rule
what does the thumb represent? (Higher)



When using Fleming's left hand rule what does the thumb represent? (**Higher**)

The direction of the force felt by the wire, and therefore the direction of **motion** of the wire.

(Thumb = **motion**)



What factors affect the size of the force on a current-carrying wire in a magnetic field? (Higher)



What factors affect the size of the force on a current-carrying wire in a magnetic field? (Higher)

- The magnitude of the current flowing through the conductor.
- The strength of the magnetic field that the conductor is placed in.



If the direction of current in a current-carrying wire placed in a uniform magnetic field is reversed, what happens to the force? **(Higher)**



If the direction of current in a current-carrying wire placed in a uniform magnetic field is reversed, what happens to the force? (Higher)

The direction of the force is reversed.



If the strength of the current in a current-carrying wire placed in a uniform magnetic field is increased, what happens to the force? **(Higher)**



If the strength of the current in a current-carrying wire placed in a uniform magnetic field is increased, what happens to the force? (**Higher**)

The strength of the force is increased.



What criteria must be met for the equation linking force, magnetic flux density, current and length to hold?
(Higher)



What criteria must be met for the equation linking force, magnetic flux density, current and length to hold? (Higher)

The conductor must be at right-angles to the magnetic field it is placed in.



How does an electric motor work? (Higher)



How does an electric motor work? (Higher)

- A coil of wire bent into a rectangle carries a current and is placed in a magnetic field.
- The forces on the two sides perpendicular to the field experience forces in opposite directions.
 - This causes a rotational effect.

