AQA Physics GCSE

4.7.2 - The Motor Effect

Flashcards

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 a strong 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 forefinger points in the direction of the magnetic field.

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

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

The second finger points in the direction of current flow in the conductor.

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.

What is the unit used for magnetic flux density? (Higher)

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Tesla, T

How does an electric motor work? (Higher)

How does an electric motor work? (Higher)

- A coil of wire, carrying a current, 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

How do loudspeakers make use of the motor effect? (Higher)

How do loudspeakers make use of the motor effect? (Higher)

The motor effect is used to convert variations in the current of an electrical circuit into the pressure variations which produce audible sound.

Explain how a loudspeaker works. (Higher)

Explain how a loudspeaker works. (Higher)

- A cone with a wire wrapped around it is connected to an a.c power supply and is placed in a permanent magnetic field
- When current flows through the wire, it creates a second magnetic field, which interacts with the permanent field
- This produces a force which causes the cone to vibrate

How is the pitch of the sound from a loudspeaker changed? (Higher)

How is the pitch of the sound from a loudspeaker changed? (Higher)

- The frequency of the a.c current is altered
- This creates a different frequency of vibration in the cone