E2 Introducing magnetic fields and the electric motor effect

Example session plan

Aim

Understanding the role of magnetic fields in the electric motor effect.

Objectives/learning outcomes

- State the origin of the two magnetic fields (permanent, electromagnet).
- Explain how the interaction of two magnetic fields can cause movement.

Time	Teacher/trainer plan	Learner activity	Resources
00.00	Introduce session aims and objectives; link to previous session on magnetic fields and electromagnetic fields. • Ask for as many 'facts' about magnets as learners can give you: record them on a spidergram on the board. Or: • Ask learners to show you responses to some basic questions on magnets.	Explain existing understanding of magnetic fields and electromagnetic fields. Answer questions.	Class whiteboard or interactive whiteboard. Mini-whiteboards.

00.10	Organise learners into pairs or small groups. Set the scene and describe the activity. Distribute the motor kits. Brief learners on producing an electric motor from the kit and ask them to be able to discuss and describe how the motor works.	Make a motor from component parts using what they know about magnets. Share ideas, try them out, discuss and explain: • why the motor works • how the motor works.	For each learner: • one AA cell • two strong cylinder magnets (provided in the resources pack) • one short piece of wire with insulation removed at each end • one nail.
Time	**Teacher/trainer plan**	**Learner activity**	**Resources**
00.30	Ask learners to work in pairs to prepare and give feedback using mini-whiteboards, posters or demonstration.	Working in pairs, learners explain own understanding to each other. Then they prepare and give feedback using mini-whiteboards, posters or demonstration.	Electric motors. Mini-whiteboards. Flip chart paper and pens. Evidence sheets for Key Skills Communication presentations if required.

00.50	Facilitate a whole class discussion and encourage learners to establish the following key points: • there is a magnetic field due to the permanent magnets • there is a magnetic field due to the current flowing through the magnets • these two magnetic fields interact causing motion • revisit and review learning objectives.	Learners answering questions and contributing to discussion on the electric motor effect.	

Assessment of learning outcomes

- Learners each explain the origin of the two magnetic fields.
- Learners each explain how the interaction of two different magnetic fields can cause movement.

Differentiation to meet individual needs

- Refer to outcomes of initial assessment of numeracy skills for each learner.
- Initial discussion to identify those that need additional learning support as well as those capable of more complex extension activities.
- Peer group selection strategies to pair less confident learners with more advanced learners.

Or:

- Group more confident learners together (extend the activities) and less confident learners together (provide additional support).
- Prepare an extension activity exploring different types of electric motors.

Teacher/trainer evaluation	Learner feedback
Consider which parts of the session were effective and why.	Consider whether the activities were suitable for all learners and the session helped to develop as expert learners.

Personal and social skills developed

- Working as a member of a team and independently.
- Communicating understanding clearly.
- Responding to questions;
- Sharing ideas and expertise with others.

Skills for Life or Key Skills developed

Take part in a group discussion

C2.1a.1 Make clear and relevant contributions in a way that suits the purpose and situation.
C2.1a.2 Respond appropriately to others.
C2.1a.3 Help to move the discussion forward.

Give a talk of at least four minutes

C2.1b.1 Speak clearly in a way that suits your subject, purpose and situation.
C2.1b.2 Keep to the subject and structure your talk to help listeners follow what you are saying.
C2.1b.3 Use appropriate ways to support your main points.