

Electricity with the Modular System

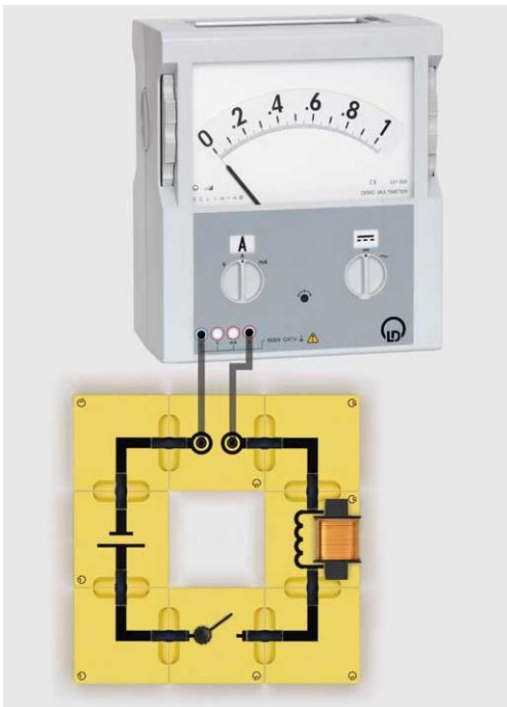
Electromagnetism and Induction
Applications of electromagnetism

Model of an electromagnet

Objective of the experiment

To demonstrate the magnetic effect of an electric current.

Setup



Apparatus

1	539 052	Coil holder, BST
1	590 83	Coil, STE, 500 turns
1	593 21	Transformer core, demountable
1	510 54	Set of 4 magnetisable rods
1	315 39	Iron weight with hook, 1 kg
1	539 025	Toggle switch, BST
1	539 053	Battery element, BST
1	539 003	Connector block BST, straight, 2 sockets
4	539 004	Connector blocks BST, 90° angle
8	539 000	Bridging plug, BST
1	531 906	Demo multimeter, passive
2	500 644	Safety connection lead, 100 cm
1	301 300	Demonstration experiment frame
1	301 301	Adhesive magnetic board

Carrying out the experiment

- Set up the circuit with the I core.
- Close the switch and hang the magnetisable rods on the I core. Then open the switch again.
- Hang the 1 kg iron weight with hook on the I core with the base facing upward and check if the iron weight sticks to the core.
- Replace the I core with the U core and repeat the experiment.

Observation

After closing the circuit, the magnetisable rods adhere to the I core of the coil.

When the circuit is opened, the rods unstick from the coil.

The I core's magnetic effect is not sufficient to hold the iron weight.

If we use the U core instead of the I core, the iron weight adheres firmly to the core as well.

Evaluation

An electromagnet consists of a current-carrying coil and an iron core.

A magnetic field is created around the current-carrying coil and is reinforced by the iron core. That's why iron bodies may be attracted by an electromagnet.

Unlike permanent magnets, the magnetic field in electromagnets can be "switched off" by interrupting the coil circuit.

An electromagnet's magnetic field can be increased for the same current by using a U core instead of an I core.