ROQED PHYSICS LAB

Assembling an electromagnet and studying its action

Purpose of the work: to assemble an electromagnet from ready-made parts and experimentally check what its magnetic action depends on.

Devices and materials:

043 - current source
045 - rheostat
042 - key
connecting wires,
028 - magnetic needle (compass),
040 - ammeter,
Coil
Iron core

Theory:
The coil through which the electric current flows is a ***magnet*** and has two poles - north and south. As the current increases, the magnetic field of the coil increases.
There is another way to enhance the magnetic field of the coil: it is enough to insert an iron core inside the coil.
The poles of an electromagnet are determined using a compass. The north end of the arrow is attracted to the south pole of the magnet, and the south end to the north.

On the board:
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How to do the work

1. Build an experiment using the picture on the board.

2. Start the simulation, the power supply will turn on.

3. Use the magnetic arrow to locate the poles of the coil. Subjectively evaluate the strength of the magnetic field. Notice how it weakens as the magnetic needle moves away from the coil.

4. Change the voltage at the power supply. Observe how the strength of the magnetic field changes depending on the increase and decrease in the strength of the current.

5. Place the metal core into the coil. Observe how the magnetic field has changed.

6. Observation results enter in the table the

	magnitude of the magnetic field
Coil without a core	weak magnetic field
Coil with a core	strong magnetic field
Decrease in coil current	Decrease in magnetic field
Increase in coil current	Increase in magnetic field

7. Draw a conclusion:
A. The coil with current (electromagnet) has magnetic poles. An iron core inserted into the coil greatly enhances its magnetic effect. The effect of the magnetic field of the coil depends on the strength of the current in it. With an increase in the current, the effect of the magnetic field increases, with a decrease in the current, it weakens.

B. The current coil (electromagnet) has magnetic poles. An iron core inserted into the coil significantly weakens its magnetic effect. The effect of the magnetic field of the coil depends on the strength of the current in it. With an increase in the current, the effect of the magnetic field increases, with a decrease in the current, it weakens.

C.The current coil (electromagnet) has magnetic poles. An iron core inserted into the coil greatly enhances its magnetic effect. The effect of the magnetic field of the coil depends on the strength of the current in it. With an increase in the current, the effect of the magnetic field weakens, with a decrease in the current, it intensifies.