ROQED
PHYSICS LAB

Study of the phenomenon of electromagnetic induction

Purpose of work: to study the phenomenon of electromagnetic induction and learn how to obtain induction current.

Required tools / items / reagents:
milliammeter,
2 coils,
arc-shaped or strip magnet,
power supply, not needed !!! The current arises due to the changing mag.field. This is the whole trick.
connecting wires.

Theory:
The phenomenon of electromagnetic induction consists in the appearance of an electric current in a conductive circuit, which either rests in a time-varying magnetic field, or moves in a constant magnetic field in such a way that the number of magnetic induction lines penetrating the circuit changes. If we change the magnetic field in time, then since it is created by a moving (freely) magnet, according to Lenz's rule, the induction current arising in a closed loop with its magnetic field counteracts the change in the magnetic flux by which it is caused. In this case, we can observe this by the deviation of the milliammeter needle.

On the board:
The phenomenon of electromagnetic induction consists in the appearance of an electric current in a conductive circuit, which either rests in a time-varying magnetic field, or moves in a constant magnetic field in such a way that the number of magnetic induction lines penetrating the circuit

changes.

The direction of the current in the coil can be judged by the direction in which the milliammeter needle deviates from the zero division.

How to do the work

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

2. Start the simulation.

3. Place the magnet in the coil. Next, insert and remove the magnet from the coil.

4. Mark your observations in Table 1, in which cases the induction current occurred:

What did you do	What you observed
Put a magnet into the coil	Current arises
Expelled the magnet from the coil	Current arises
Fixed magnet inside the coil	No current arises

5. Let's analyze the direction of the induction current. Will its direction be the same if the magnet is inserted / withdrawn into the coil by the north and then by the south pole.

6. record his observations in Table 2:

What did	What was observed
was administered magnet coil in north pole	ammeter Right Arrow deviates
withdrawn from the coil magnet north pole	ammeter deviates leftward arrow
administered magnet coil in south pole	deviates leftward arrow ammeter
withdrawn from the coil magnet south pole	arrow the ammeter deviates to the right

8. Next, we study the magnitude of the induction current. Insert and withdraw the magnet at different speeds. Record your observations in Table 3.

9. Attach the south pole of another strip magnet to the north pole of the bar magnet. Record the observations in Table 3 with the introduction of two magnets at the same time.

10. Table 3

What they did	What they observed
Slowly approaching the magnet to the coil	Slight deviation of the ammeter needle
Quickly bringing the magnet closer to the coil	Large deviation of the ammeter needle
Two magnets were simultaneously approaching the coil	Large deviation of the ammeter needle

12. Conclusion:
A. As a result of laboratory work, we were convinced that with any change in the magnetic flux penetrating the area bounded by a closed conductor, an electric current arises in this conductor, which exists during the entire process of changing the magnetic flux.
B. As a result of laboratory work, we were convinced that with any change in the magnetic flux penetrating the area bounded by a closed conductor, an electric current arises in this conductor, which exists during the entire process of changing the magnetic flux.
C. As a result of laboratory work, we were convinced that regardless of the change in the magnetic flux penetrating the area bounded by a closed conductor, an electric current arises in this conductor.