Oersted's Law Apparatus | # 32630

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Learning Through Discovery

OPERATING INSTRUCTIONS

Purpose:

To demonstrate that an electric current produces a magnetic field, and to facilitate the investigation of Ampere's "Right Hand Thumb Rule."

Background:

In 1820, Hans Christian Oersted discovered that a magnetic needle deflected in the presence of an electric current. This discovery linked magnetism and electricity for the first time. Andre Marie Ampere took Oersted's research a step further by proving that the magnetic field around a conductor forms concentric rings.

Ampere's study became the basis for the "Right Hand Thumb Rule." This rule states that with your right hand, extend your thumb and point it in the direction of current flow. Now curl your fingers into your palm. The direction in which your fingers point while curled is the direction of the magnetic field around the conductor.

Contents:

One (1) Aluminum Loop
One (1) Magnetic Needle
One (1) Support Base
One (1) Slotted Plastic Insulator
One (1) Support Rod with, pin, washers and hex nut

Required Accessories:

One (1) Dry Cell Battery; 1.5Volt
One (1) Set of 2 Leads with Alligator Clips

Assembly:

1. Fasten the support rod to the support base which is threaded to receive it.

2. Fasten the aluminum loop to the support rod with the washers and hex nut, being careful to avoid damage to or injury from the sharp pin.

3. Carefully position the Slotted Plastic Insulator near the free end of the aluminum loop to provide support. Make sure the arms of the loop are parallel, bending them if necessary.

4. Place the magnetic needle on the pin, allowing it to rotate freely and align itself with the Earth's magnetic field.

5. Carefully rotate the entire assembly to align the aluminum loop with the magnetic needle.

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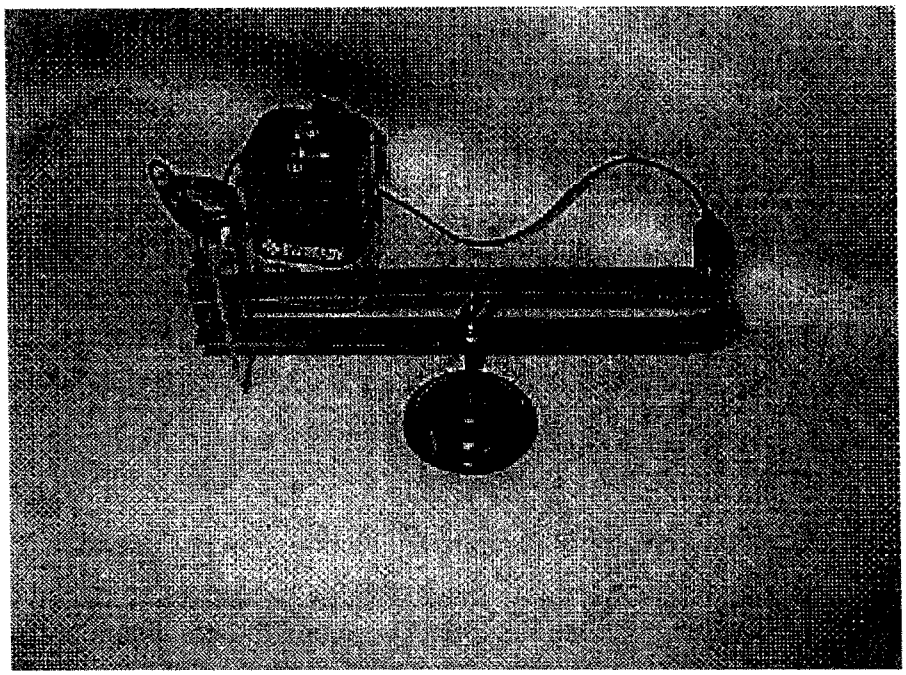
OERSTED'S LAW APPARATUS:



Experiments:

1. Connect the battery between one end of the aluminum loop and its bend using leads with alligator clips. Observe what happens to the magnetic needle and explain why. Which way is the current flowing? What are the directions of the magnetic fields acting on the magnetic needle? What happens when the battery connections are reversed?

2. Change connection to the other end of the aluminum loop using leads with alligator clips. Observe the response of the magnetic needle and explain why. Which way is the current flowing? Have the directions of the magnetic fields acting on the magnetic needle changed? What happens when the battery connections are reversed?

3. Connect battery between both ends of the aluminum loop using leads with alligator clips. Observe the response of the magnetic needle and explain it.

4. Remove all battery connections and observe the response of the magnetic needle and explain what happens.

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Time Allocation:

To prepare this product for an experimental trial should take less than ten minutes. Actual experiments will vary with needs of students and the method of instruction, but are easily concluded within one class period.

Feedback:

If you have a question, a comment, or a suggestion that would improve this product, you may call our toll free number **1-800-299-5469**, or e-mail us: **info@thesciencesource.com**. Our FAX number is: **1-207-832-7281**.

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