

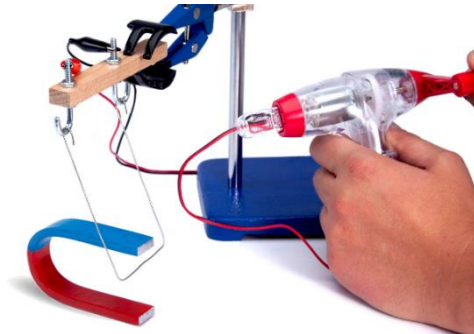
INSTRUCTIONAL GUIDE

Contents

- U-shaped magnet
- Wooden swing holder with two support hooks
- Coated copper wire swing

Recommended for Activity:

- [Genecon Hand Crank Generator \(P6-2631\)](#)
- [Burette Clamp \(66-8002\)](#)



Background

The Electric Swing Apparatus allows students to see the fundamental connection between electricity and magnetism— a current-carrying wire moves in the presence of a magnetic field. This is instrumental in understanding how electric motors work. The apparatus also demonstrates how current polarity determines what direction the magnetic force pushes the swing. The relationship between magnetic fields and currents is often represented mathematically as a vector product of the moving charge and the magnetic force. As with vector products, the direction of the resulting force is determined by *Fleming's "Right-hand Rule."* The apparatus dramatically demonstrates this property.

Set-Up

Use a ring stand and clamp to set up the swing holder and hang the wire from the support hooks. Connect the Genecon (see below) or battery leads to the posts or bolts of the two metal hooks. One student should crank the Genecon handle. Nothing appears to happen. But turning the Genecon handle in one direction produces a magnetic field around the wire. Have another student hold the magnet so that the wire is located between the two poles and immersed in the magnetic field. Then apply the current once again. Because the wire carrying the current is situated within the magnetic field of the U-magnet, the wire will swing. Repeat the above while cranking in the opposite direction. What happens? By alternating the direction of handle rotation, you can get the wire to swing back and forth.

Related Products

World's Simplest Motor (P8-8300) By building and observing a motor that converts electrical energy into motion, students discover and explore first-hand several key properties of electricity and magnetism.

Electromagnetic Force Demonstrator (P6-2625) Watch how the aluminum pipe travels along the track in the direction the current is applied, reinforcing the interrelated concepts of Current, Magnetic fields and the Lorentz Force.

Electromagnet (P8-8100) With this electromagnet, your students can more easily visualize the relationship between electricity and magnetism.