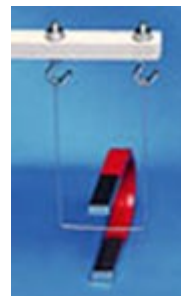


Electric Swing Apparatus

P8-8009



BACKGROUND:

The Electric Swing Apparatus allows students to visualize the connection between electricity and magnetism – to see a current-carrying wire move in the presence of a constant magnetic field. This is instrumental in understanding how motors work.

The apparatus also makes it clear that the current direction determines what direction the magnetic force will push the swing. The relationship between magnetic fields and moving 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 Rule* or the *Right-hand Rule*. The apparatus dramatically demonstrates this property.

KIT CONTENTS:

- 1 U-shaped magnet
- 1 wooden swing holder with two support hooks
- 1 coated copper wire swing

SET-UP AND ACTIVITIES:

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 quickly alternating the direction of handle rotation, you can get the wire to swing back and forth.

RELATED PRODUCTS:

The **Genecon** (P6-2631) is a simple hand-cranked generator. Students get to actually feel how much energy it takes to produce electricity.

The **World's Simplest Motor** (P8-8300) is ideal for hands-on activities on electricity and magnetism. Students, with the help of a D battery, change electrical energy into energy of motion.

