Eddy Current Kit

1001001

Introduction

Eddy currents were discovered by the French physicist Léon Foucault in 1855. He noticed that by placing the rim of a copper disc between two magnets, the disc became harder to rotate. Eddy currents arise when any conductor is placed in a moving or changing magnetic field. The field causes some of the electrons in the conductor to move about, which in turn creates a current. All electrical currents generate a magnetic field. Thus, a current induced by a moving magnet produces a secondary magnetic field, which can attract or repel the original one.

Operation

Your kit can perform two experiments

1. Showing the effect of the current on a magnet
2. Generating electricity

Experiment 1

You will need the copper tube and the two slugs. Although the slugs look identical, one is plain aluminium while the other is a powerful neodymium magnet. Hold the copper tube upright. Drop the aluminium slug through it. Acted upon solely by gravity, it will fall through very quickly. Next, drop the magnetic slug through the copper tube. Copper is nonmagnetic, so the magnet will not stick to it. However, copper is a good conductor. As the magnet moves through the tube, it will create eddy currents in the copper. These currents will produce their own magnetic field, which attracts the magnet. The effect is a 'drag' on the magnet, which slows its fall. While the aluminium slug fell through in less than one second, the neodymium one will take about two.

Experiment 1

For the next demonstration, you will need the clear tube with the copper coil. Connect one of the included LEDs to the alligator clips. Place the aluminium slug in the tube, cover both ends with your fingers, and shake vigorously. Nothing will happen. Next, repeat the procedure with the neodymium slug. As the magnet moves through the copper coil, it causes eddy currents to form. These eddy currents provide just enough power to light the LED. As you shake the tube, the LED will flash. Extra O-rings are provided to hold the copper coil in place