



ELECTROMAGNET KIT

EMKIT2

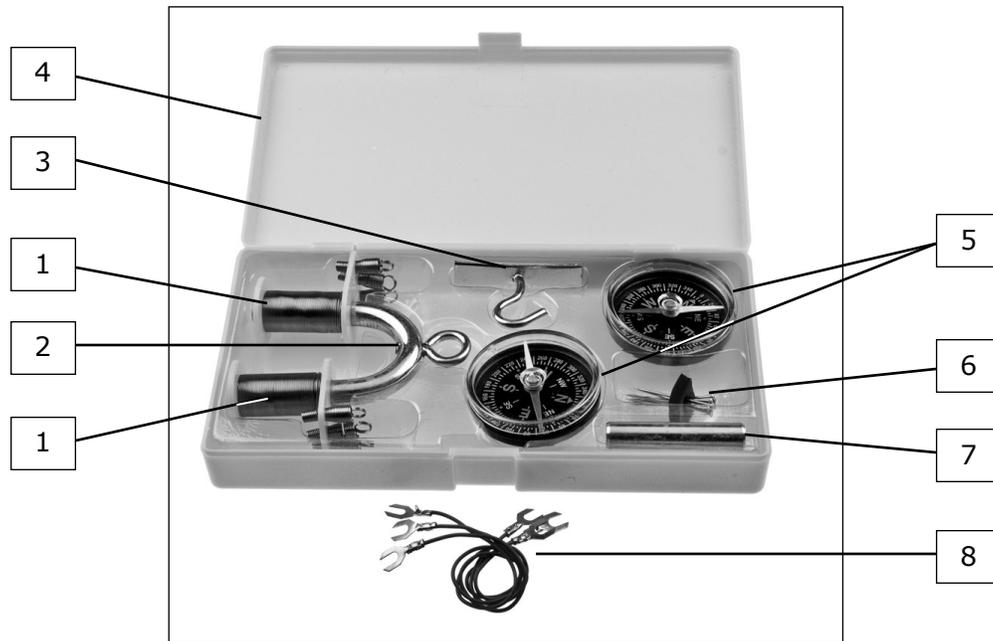


Figure 1

DESCRIPTION

The EMKIT2 Electromagnet Kit allows students to investigate the magnetic fields produced by a current-carrying coil with and without an iron core. The coil is energized by a "D" size battery (not included) and the resulting magnetic field is investigated with compasses and steel pins. In a U-magnet configuration, the lifting power of the magnet is investigated.

The components of the kit are shown in *Figure 1*.

1. Coil (2 included)
2. U-magnet iron core
3. U-magnet lifting bar with hook
4. Storage case
5. Compass (2 included)
6. Steel pins (10 included)
7. Bar magnet iron core
8. Connecting cords (3 included)

SETTING UP THE COMPONENTS

The electromagnets all contain one or two coils attached to a battery by the connecting cords.

The coils have three springs for attaching the cords (*Figure 2*.) The springs are attached to each end of the coil windings and to the middle point, so that current can be passed through half of the windings or all of them, depending on the springs chosen for connection to the battery.

The cords are attached to the springs by pulling on the ends of the springs to open the windings, inserting a tongue of the spade lug, and releasing the spring to hold the lug (*Figure 3*.)



Figure 2



Figure 3

The coils can be used alone to create a magnetic field, or an iron core can be inserted into the central hole in the coil former. Two cores are provided. Inserting the straight core into a coil produces a bar magnet (*Figure 4*), and two coils can be used with the U-core to produce a U-magnet (*figure 5*.)



Figure 4



Figure 5

To send current through both coils of a U-magnet, the coils must both be connected to the battery, and they must both produce a magnetic field in the same direction, or they will neutralize each other and generate no outside field. The kit allows the coils to be connected in series (i.e., one after the other in the circuit.) *Figure 6* shows how they must be connected to make sure that their fields are in the same direction.

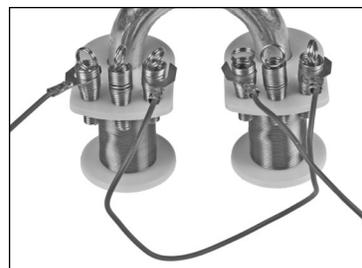


Figure 6

In *Figure 6*, the whole winding of each coil is being used. To use half of the windings, one connection on each coil should be moved to the center spring.

To connect the coils to the battery, a battery holder is needed. One with side tabs for inserting the spade lugs as shown in *Figure 7* is convenient for making a quick and reliable contact. A suitable model is United Scientific Supplies BTHD01. A model with Fahnstock clips such as BTHP01-F is also suitable.



Figure 7