615-0270 (20-110) Magnetic Field Demonstrator

Parts List:

One transparent plastic case, which contains iron filings in a viscous liquid (6-1/4 x 3-1/2 x 3/8" in size).

Warranty and Parts:

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required.

How to Teach with Magnetic Field Demonstrator:

Concepts Taught: Magnetic field, magnet, compass.

Curriculum Fit: Magnetic Field and Magnetism.

Additional Materials Needed:

- Various magnets (bar, horseshoe, etc.)
- Compass
- Overhead projector

Theory:

What is a magnetic field? It can be defined as: *the lines of force around a permanently charged magnet or a moving charged particle.*
What is a magnet? It can be defined as: *a piece of equipment that can attract pieces of iron or steel.*
What is a compass? It can be defined as: *a magnetized needle, mounted on a pivot, which points in a north direction.*

Experiment 1: Magnetic Fields
Kit Components Needed: Magnetic field demonstrator
Additional Items Needed: Overhead projector, horseshoe magnet, bar magnets, compass

Procedure:

1. Set up an overhead projector if you intend for an entire class to view the demonstration. Alternately, clear an area on a laboratory bench top or table and have students surround the area in order to view the demonstration.
2. Have the students label three plain white pieces of paper with the following headings: Horseshoe Magnet Field Pattern, Bar Magnet Field Pattern and Two Bar Magnets Field Pattern.
3. Shake the magnetic field demonstrator to ensure that the iron filings in the viscous liquid are well dispersed throughout the case. Place the horseshoe magnet on the overhead projector or table and then place the magnetic field demonstrator on top of the magnet.
4. Observe how the iron filings line up along the magnetic lines of force. Students should draw the pattern of the field on the appropriately labeled white piece of paper from step 2.
5. The instructor should determine the direction of the field at various locations by placing a small magnetic compass at a number of different positions in the field created.
6. Remove the magnetic field demonstrator and magnet from either the table or overhead projector. Shake the magnetic field demonstrator to ensure that the iron filings in the viscous liquid are well dispersed throughout the case. Instructor should repeat steps 3-6 for the bar magnet and the scenario with two bar magnets. *Note: In the scenario with two bar magnets, please ensure that the magnets are perpendicular to one another, but not touching.*

Discussion:

The iron filings act like a compass needle and arrange themselves along the curved lines leading from the north pole of the bar and horseshoe magnets to the south pole. The compass needle sets itself parallel to the magnetic line of force through its center. You may wish to incorporate more magnets or different types of magnets in your demonstrations and have students determine the direction of the magnetic lines of force around each magnet.

Related Products:

Science First® *manufactures many low-cost items that can be ordered from most science education distributors. For more information, please contact us.*

The **20-100 Floating Magnet** illustrates the critical concept of magnetic repulsion. It features four strong ceramic disc magnets and is large enough to be seen by an entire class.