

Introduction To Magnets

Objective:

The students will familiarize themselves with several different kinds of magnets. They will observe the forces of attraction and repulsion between the different poles. I will introduce and we will experiment with the forces of magnetism, electromagnetism and static electricity. This lesson can be adapted to instruct kindergarten through high school. This is a three to four week unit.

Standards:

- SC-E-1.3.4 - Magnets attract and repel each other, and magnets attract certain kinds of other materials (e.g., iron).

Materials Needed:

The materials needed for this introductory lesson is as follows:

- A. magnets of different sizes and shapes (bar, horseshoe, etc.)
- B. iron filings
- C. stand for holding two magnets with a string
- D. miscellaneous items; Such as, bottle caps, buttons, paper clips, coins, pencils, pens, needles, and plastic disks
- E. chart paper, tissue paper and drawing paper
- F. markers and crayons
- G. scissors and string
- H. picture charts (for visual display)
- I. masking tape
- J. clear plastic board, approximately 6x8 or plastic wrap
- K. overhead projector machine and transparency sheet
- L. batteries
- M. wire
- N. fur
- O. Plexiglas case with filings
- P. compass

Strategy:

Activity 1:

In this unit we will explore the forces of attraction and repulsion. Such as magnetism, electromagnetism, and static electricity. Sometimes the students will work in small groups on experiments and at other times they will work individually (according to the activity and class size). The teacher will set up the materials necessary for each experiment and the students will gather the materials that they will need for each experiment.

The strategy of the first lesson is to let the students explore and observe the magnets. They will observe the lines of force, the attraction and the repelling forces that all magnets exhibit. They will also become familiar with the poles of each magnet and observe for themselves the differences between the north and south sides of the magnet. Each group of students will have to select from the list of materials a chart marker, magnets of different shapes, paper clips, plastic paper cut in squares, iron filings and other miscellaneous materials.

The teacher will use the overhead projector, two bar magnets, iron filings and a transparency sheet to demonstrate and compare the forces of the magnet's poles. Each group of students will use their experience charts and markers to jot down information that they have gathered about their magnets. They will then present their data to the class.

Later, after the students have completed their observations of magnets, they can begin to experiment with them. They should label each experiment.

Activity 2:

The next experiment is to understand how a compass works. They will find out that the earth acts like a giant magnet and attracts other magnets toward its north pole. For this experiment the children will need a bowl, sewing needle and a small square piece of tissue paper. The students will float a small piece of paper in a bowl of water, and rest a needle (that has been rubbed with a magnet) on it. When the needle is still they will mark which way it points. The students can compare their experiments with others that made needle magnets. They should find that all needles should point the same direction, which is along a north-south line.

Performance Assessment:

The student will be assessed as a group and individually according to whether they have completed every task asked of them. Each student will demonstrate knowledge of what each experiment is about and explain on paper and orally what each experiment demonstrates.