

## Practical: Introduction Magnetism

There are 6 stages, where you will find one experiment about magnetism. In a so-called show-jumping course you will do all experiment one after the other. You just start with one. It has not to be the stage 1. At each stage you will stay about 10 minutes and make your observations. Write down in your notebook, what you observe. On a stroke of a bell you move to the next experiment and do it.

### STAGE 1      The experiment of Oersted

Use the compass needle to verify direction north. Align the wire also in north south direction at a distance of about 5cm from the compass. Connect the wire to the battery. What are you observations? Reverse the direction of the current by exchanging the connections to the battery. What changes?



### STAGE 2      Vector field

Put the bar magnet horizontal on the table and add on top of it the rectangular cardboard. Equally distribute iron filings on the cardboard and observe the pattern formed. Draw the magnetic vector field of the bar magnet in your notebook. Redo the experiment with two bar magnet positioned parallel at a distance of about 3 cm.

### STAGE 3      Field lines

A lot of the little nails are in a plastic container. Put the bar magnet horizontally on the nails and lift it up slowly and observe the alignment of the nails. Draw the field lines into your notebook. Do the same but hold the bar magnet vertically, so that only one end get in contact with the nails and again with the other end.

**STAGE 4          Field through matter**

On a stand a bar magnet is fixed vertically. A paperclip is positioned few cm below the magnet by means of a thread. Put sheets of different substances in between magnet and paperclip and observe, how well the paperclip stays in position. Write down the observations

**STAGE 5          Magnetic force**

One bar magnet is hanging on a stand. With the end of a second bar magnet slowly approach one end of the hanging magnet. Try it with different ends of the magnet. What do you observe? Do the same but using instead of the second magnet a steel bar.

**STAGE 6          Make a magnet - destroy a magnet**

Check with the compass if the nail is magnetized or not. Magnetize the nail by moving the bar magnet along the nail always in the same direction (20 to 30 times). Verify with the compass that the nail now is magnetized. Demagnetize the nail by nailing "in the air" also about 20 times. Check again with the compass

