

# The Floating Paper Clip

**The Action** Help your students learn about magnetism, by illustrating the powerful attraction of a paper clip to a magnet. The most amazing part is that the paper clip doesn't even touch the magnet.

**Grade Level** Grade 2 – Magnets  
Grade 4 – Electricity & Magnetism  
Physics 30 - Electromagnetism

**Materials** A rod magnet  
Ring stand with clamp  
Paper clip  
String  
Tape

**Instructions** Clamp a rod magnet vertically and tape a cardboard sign "The Floating Paperclip" in front of it (The bottom edge should be flush with the magnet – Note that this sign is optional). Tie a paper clip to a thread and tape the other end of the thread to the base of the stand, such that the clip is still held up by the magnet, but leaving a gap between the two. Show the students that the thread is not holding the clip up by sliding thin objects through the gap (like a ruler, card, comb, etc). Now take a pair of scissors and "cut" the magnetic lines that are holding the paper clip up.

## **Safety**

**Hints** This demonstration can be used to demonstrate the strength of magnets to grade 2 students, and can be further explained and used in Physics 30 when exploring electromagnetism.

**Science Principle** Magnetic lines hold up the paper clip. When the magnetic lines are prevented from going through the clip, it falls. Materials that can absorb the magnetic lines from the magnet are materials, which are iron, nickel, or cobalt or contain any amount of it (for instance in an alloy).

Magnetism originates from within the atom. In the magnetic materials (iron, nickel, or cobalt) the electrons around the nuclei although paired

together, do not completely cancel out the magnetic fields. They could be considered as consisting of minute magnets that are randomly arranged. When these minute magnets are all lined up in one direction, the object can become a strong magnet.