



How Magnets Attract and Repel Each Other

KS3 Ages 11-14 ⌚ 3 min read

What Makes a Magnet Magnetic?

Magnets seem magical, but they work because of tiny invisible forces called **magnetic fields**. Inside every magnet, **electrons** (teeny tiny bits of atoms) are spinning around like miniature planets. When lots of electrons spin in the same direction, they create a magnetic field—an invisible area of force around the magnet.

Not all materials can be magnets. **Iron, nickel, and cobalt** work best because their electrons can all spin the same way. In materials like **plastic** or **wood**, the electrons spin randomly in different directions, so no magnetic field forms.

The Two Poles

Every magnet has two ends called **poles**: a **north pole** and a **south pole**. The magnetic field flows out from the north pole, loops around through space, and comes back in at the south pole. This invisible flow is what creates the pushing and pulling force.

Think of it like water flowing out of a hose: it shoots out one end (north pole) and has to go somewhere, eventually coming back (south pole).

Why Do They Attract?

When you put the **north pole of one magnet near the south pole of another magnet**, something cool happens—they snap together! This is **attraction**. The magnetic fields from both magnets are flowing in the same direction at that point, like two rivers merging smoothly. The magnets want to line up so their fields match perfectly.

Why Do They Repel?

Now flip one magnet around. When you try to push the **north pole near another north pole** (or south near south), they push each other away. This is **repulsion**. The

magnetic fields are flowing in opposite directions, like two rivers crashing head-on. The magnets are fighting to avoid each other.

Think of it like two fans blowing air at each other: if they both blow outward, the air smashes together and pushes them apart.

The Real Power

The stronger the magnetic field, the more powerful the push or pull. **Electromagnets** (magnets powered by electricity) can be incredibly strong and are used in everything from phone speakers to hospital **MRI** machines. Understanding magnetic attraction and repulsion is why we have compasses, electric motors, and even maglev trains that float on magnetic force!