

Physics for Kids

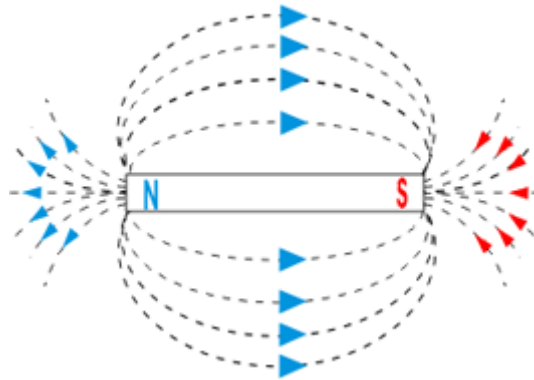
Magnetism



Magnetism is an invisible force or field caused by the unique properties of certain materials. In most objects, electrons spin in different, random directions. This causes them to cancel each other out over time. However, magnets are different. In magnets the molecules are uniquely arranged so that their electrons spin in the same direction. This arrangement of atoms creates two poles in a magnet, a North-seeking pole and a South-seeking pole.

Magnets Have Magnetic Fields

The magnetic force in a magnet flows from the North pole to the South pole. This creates a magnetic field around a magnet.



Have you ever held two magnets close to each other? They don't act like most objects. If you try to push the South poles together, they repel each other. Two North poles also repel each other.

Turn one magnet around, and the North (N) and the South (S) poles are attracted to each other. Just like protons and electrons - opposites attract.

Where do we get magnets?

Only a few materials have the right type of structures to allow the electrons to line up just right to create a magnet. The main material we use in magnets today is iron. Steel has a lot of iron in it, so steel can be used as well.

The Earth is a giant magnet

At the center of the Earth spins the Earth's core. The core is made up of mostly [iron](#). The outer portion of the core is liquid iron that spins and makes the earth into a giant magnet. This is where we get the names for the north and south poles. These poles are actually the positive and negative poles of the Earth's giant magnet. This is very useful to us here on

Earth as it lets us use magnets in compasses to find our way and make sure we are heading in the right direction. It's also useful to animals such as birds and whales who use the Earth's magnetic field to find the right direction when migrating. Perhaps the most important feature of the Earth's magnetic field is that it protects us from the Sun's solar wind and radiation.

The Electric Magnet and Motor

Magnets can also be created by using electricity. By wrapping a wire around an iron bar and running current through the wire, very strong magnets can be created. This is called electromagnetism. The magnetic field created by electromagnets can be used in a variety of applications. One of the most important is the electric motor.

