

Magnetic Magnets

Creation

Magnets are created when the electrons in the object all point in the same direction.

Magnets

A magnet is something that creates a magnetic field.

A magnet is made up of 'mini-magnets' called magnet domains that are aligned.

A material will behave like a magnet if most of these mini magnets are aligned in one direction; if unmagnetized the mini-domains will point in all different directions.

What can magnets do?

Magnets attract and repel each other and certain kinds of other materials.

Magnetic

An object is considered to be magnetic, or magnetically charged when the electron particles of an object all point in the same direction

Magnet Domains

When its magnetic domains are all lined up, the material is said to be magnetized

When its magnetic domains are all jumbled up, the material is said to be unmagnetized or demagnetized



Magnetic Field

A magnetic field is the region around a magnet where a force acts on another magnet or on a magnetic material.

To create a magnetic field, electrons have to move. This creates two basic types of magnets:

1. Those made by causing an electrical current to flow within a wire conductor also known as electromagnets
2. those made of iron or other elements, these would then be split into two further groups and be either permanent magnets or temporary magnets.

Permanent Magnets

Permanent magnets maintain their own magnetic fields without any assistance.



The magnetic field cannot be turned on and off on a permanent magnet, it is there all the time

Permanent magnets are made from:

SmCo (samarium, cobalt and iron)

Alnico (aluminum, nickel, cobalt and iron)

NdFeB (neodymium, iron, boron, a rare earth magnet)

Temporary Magnets

Temporary Magnets only exhibit signs of magnetism when exposed to strong magnet fields.

Temporary magnets are made from soft metals, and only retain their magnetism while near a permanent magnetic field or electronic current.

Temporary magnets can be magnetized by including bringing the object close to a strong magnet and stroking the object while in the magnetic field from North to South

It may take 20 or more strokes to magnetize

Poles

Magnets have 2 poles

They have poles on the top and bottom; known as North and South



The north pole is positively charged and the south pole is negatively charged.

Magnets are attracted to each other when opposite poles are near each other.

Magnets are repelled when similar poles are near each other.

Strength of Magnets

The strength of the magnet depends on the size of the magnet and the number of its tiny magnets that are aligned.

Rare earth magnets have about 10 times the magnetic strength of ferrite magnets

A neodymium or a rare earth magnet would be stronger than a ceramic or ferrite magnet of the same size.

How to test for Magnetism

A permanent magnet can:

Attract a magnetic material but not repel it

Attract or repel another permanent magnet

