

### **What is a magnet?**

A magnet is any object that generates its own magnetic force or the force of pulling, called a magnetic field. Despite being invisible, a magnet's magnetic field is responsible for producing the force that attracts other objects.

The ancient Greeks discovered that some rocks, known as lodestones, produced their own magnetic field. Today magnets are specially made.

Magnets come in many shapes and sizes and can be made from different types of material but only metals are magnetic.

### **Which materials are magnetic?**

Some magnets are stronger than others. You can test two different types of magnets by seeing which one will hold more paperclips. Of course, not all materials are magnetic; They can't pull things like paper, glass or cloth, only things that are made of iron or that contain iron, so if you try and attach a magnet to something plastic, it's just not going to work.

### **How Does Magnetism Work?**

Magnets have two ends to them. These are called poles – a North Pole and a South Pole, just the same as the earth. The two ends of the magnet may look the same but they don't do the same things.

If you get two 'North Pole' magnet ends – or two 'South Pole' magnet ends – and try putting them together, they will push away from each other. But if you take a 'North Pole' magnet end and put it near a 'South Pole' magnet end, they will pull towards each other.

Another interesting thing is if you chop a magnet in half, you get two identical magnets and each has a North and a South Pole, so you will never find a magnet with just a South Pole or just a North Pole.

## **What is a compass?**

A compass is made of a tiny magnet in the shape of a needle which is allowed to spin.

It is a simple tool with a magnet which balanced, called a needle. The one end was often marked "N," for north, or colored in some way to show that it pointed north.

Because of the earth's magnetic field the magnetic needle was always drawn to the magnetic North Pole. It doesn't point exactly north because true north is at the North Pole.

Before GPS satellites were invented, the compass was used to tell us what direction we were facing – this would be rather useful if you were stuck in the middle of the ocean.

## **The Earth as a magnet**

Did you know the Earth actually produces its own magnetic field? This is because Earth's core is mainly made up of iron, one of the best materials for making magnets. Part of the Earth's core is continuously spinning really fast, which creates a magnetic field and is the reason why the Earth has a North Pole and a South Pole.

The field is strongest at the actual poles. The Sun is also very magnetic.

## **Why are Magnets Important?**

Magnets are great fun to play with but they are also seriously important and they are used in so many ways in our world.

They hold notes to the fridge and help close fridge doors.

They are used in microwaves, electric fans, and earphones, speakers, in medical equipment, electronics and in nearly all electric machines that use motor engines to make them work.

Electricity and magnetism have a strong connection with each other and scientists call this 'electromagnetism'.

Interestingly it is due to magnetism that we get electricity in our homes or are able to make and run electric motors.

This is because a magnet can create an electric current and an oppositely an electric current in turn produces magnetism.

So, there's everything you need to know about magnetism. We hope it is nice and clear and that you'll be a super kid in all things magnetism when you're asked about it!

### **HOW TO MAKE A TEMPORARY MAGNET**

You can convert a metallic (iron) object into a temporary magnet. For this take a bar magnet and rub it over an iron nail or steel ruler from one end to other end (say from A to B) without lifting it. At the end B lift the magnet (in a semicircular motion) and again place it at A. Repeat the rubbing procedure.

Now test end A of the iron piece by getting a magnetic compass close to it and seeing its deflection. Also if you get a few common pins close to this end they will stick on the end.

### **HOW TO DEMAGNETISE A MAGNET**

1. In order to demagnetize a magnet or in order to make it weak, we can apply heat to the magnet and it shall become weaker.

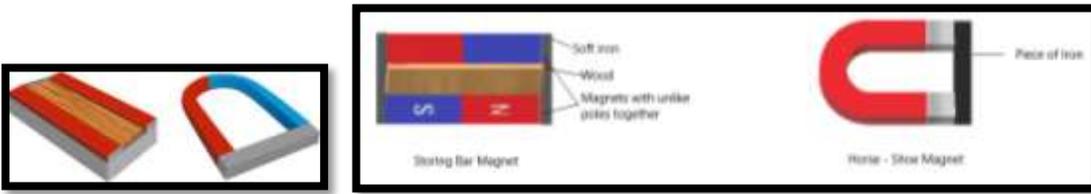
Now try to stick any metal object on this magnet and it will not stick.

2. Magnets also lose their property if hammered or handled roughly.

3. Magnets also lose their magnetism if they are kept without any protection.

4. The bar magnets should be stored in pairs in a wooden box separated by a piece of wood such that their opposite ends face each other. Further pieces of iron should be placed at both ends. These pieces of iron are called magnetic keepers.

In case of a horse shoe magnet a piece of iron should be placed at its ends. This piece of iron will stick to its ends and prevent the loss of magnetism



## **CONCEPT OF ELECTROMAGNETISM**

Magnetism has a strong connection with electricity and also vice versa. This is an interesting observation about we will study in later classes. It depicts that whenever an electric current flows around a metallic wire, it generates a magnetic field around it which is in a direction perpendicular flow of the current. This means that the metal piece through which the electricity is flowing also starts behaving like a temporary magnet.

This can also be proved by getting a magnetic needle close to a wire through which electricity is flowing and witnessing the deflection of the magnetic needle.