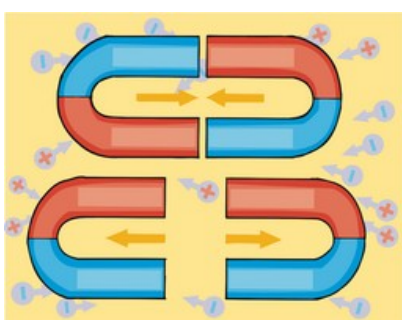
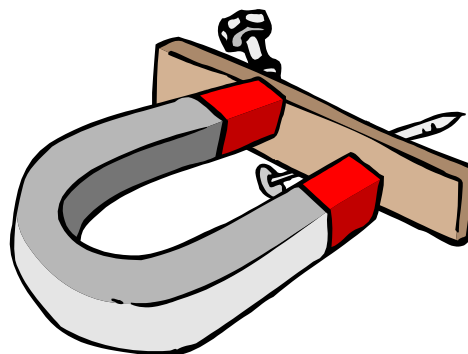


A magnet is a piece of rock or metal that can pull other metals **towards** it. The **force** of magnets is called magnetism. Together with **gravity** and **electricity** it is a **basic force** of nature. Early humans **discovered** magnets and magnetism thousands of years ago. They found out that **certain** types of rock, called **loadstone**, pulled iron and other metal objects **towards** it. After some time they found out that thin pieces of such a rock would always **point** in one **direction** if you **hung** it on a piece of **thread**. The ends of such a metal are the poles of a magnet. All magnets have a magnetic field around them, the **force** between the two poles.



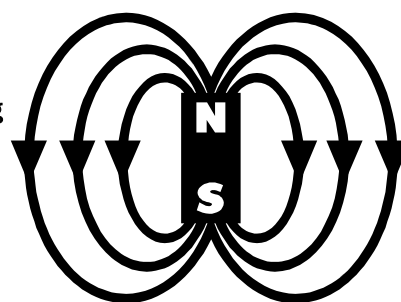
Magnets **attract** or **repel** other metals. This is because every magnet has two poles: a north and a south pole. North and south poles **attract** each other but two north poles or two south poles push each other apart.

Our planet is also a big magnet with a North and a South Pole. But the Earth's magnetic poles are not in the same place as the geographic poles. The magnetic North Pole, for example, is in northern Canada. Compasses always **point** to the magnetic poles, not to the geographic ones.

Magnetism comes from **electrons**, the tiny **particles** that fly around the **nucleus** of an atom. They are negatively **charged** and produce a very **weak** magnetic field. When many of these **electrons point towards** the same **direction** they can pull metals to them.

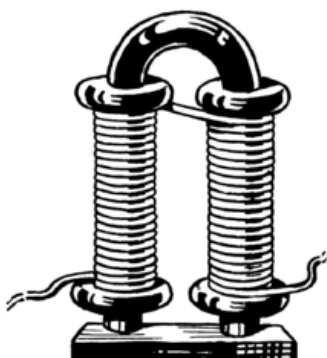
It is also possible to make a magnet by taking an existing one and **rubbing** another piece of metal with it. If you keep **rubbing** the new piece of metal in the same **direction** its **electrons** will start to **point** in that **direction**, thus **creating** a new magnet.

If a magnet keeps its magnetic field all the time we call it a **permanent** magnet. **However**, not all magnets are **permanent**. Some objects become magnets only when **electricity** passes through them. They are called electromagnets. There are many examples of such electromagnets in everyday life: car motors, railway signals, **loudspeakers**.



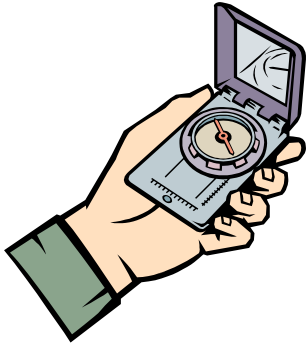
Magnetic field lines go from pole to pole where the magnetic force is strongest

MAGNETISM AND ELECTRICITY



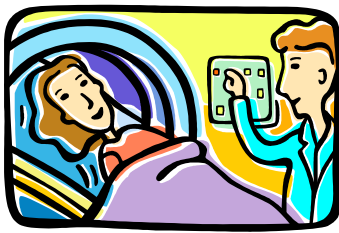
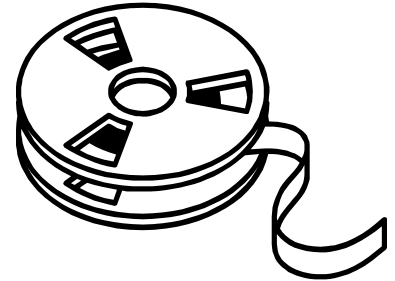
In the 1700s **scientists discovered** that magnetism and **electricity** had similar features. Just like magnets have two poles, **electricity** has positive and negative **charges**. A positive and a negative charge **attract** each other and two negative or two positive **charges repel** each other.

After they had found this out they started making **useful tools** and machines with the help of **electricity** and magnetism. The Danish physicist Oersted sent **electricity** through a **wire** and put a compass near it. To his surprise the compass **needle** moved. Soon after that the first electromagnet was made by making a **wire** into a **coil** and sending **electricity** through it.



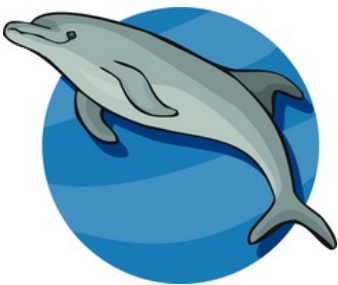
USE OF MAGNETS

The first magnetic instruments were compasses which **sailors** used to **guide** them on their **journeys**. Today, magnets can be found in many areas of everyday life. They are in washing machines, hold doors shut and work in **generators** and electric motors. **Credit cards** have magnetic **strips** on them that give you financial information. Magnetic audio and **videotapes** as well as disks have many **tiny** magnetic **particles** which are used to **store** sounds, pictures and other information.



In medicine a magnetic resonance imaging machine (MRI) can **create** exact pictures of organs and bones inside the human body . It is much better and more exact than **x-rays**.

Powerful electromagnets are **attached** to big **cranes** that can move iron and steel. In some parts of the world trains travel on **tracks** that are **magnetized**. These trains, called maglev, are **lifted** above the **tracks** and do not have any contact with them. They travel at **speeds** of up to 480 km an hour.



MAGNETS IN ANIMALS

Scientists have also **discovered** that some animals, like **pigeons**, **dolphins** and **turtles** may have some magnetic **particles** in their body. They are able to **detect** the Earth's magnetic field and find out their location.



WORDS

attach = connect

attract = to pull an object towards another one

basic = important, main

charge = electricity that is put into a battery or another electrical object

coil = a wire that is wound in a circle ; when electricity passes through it it gives you light or heat

crane = a tall machine that is used to lift heavy things

create = make

credit card = small plastic card that you use to buy things and pay for them later

detect = find

direction = way , course

discover = to find out for the first time

dolphin = a very intelligent sea animal like a fish with a long grey pointed nose

electricity = the power that is carried by wires and cables to make machines work or give light or heat

electron = a very small particle that moves around the nucleus of an atom

force = power

generator = machine that produces electricity

gravity = the power that makes something fall down to Earth

guide = lead

hang—hung = fall from an object

however = but

journey = a long trip

lift = raise

lodestone = a piece of iron that acts like a magnet

loudspeaker = something that makes sounds louder

magnetize = to make iron or steel able to pull other pieces of metal towards itself

needle = pointer

particle = very, very small element of something

permanent = something that lasts forever

pigeon = a grey bird with short legs that you can often find in cities

point = show

repel = to push an object away from another one

rub = to press your hand backward and forward over an object

sailor = a person who works and lives on a ship

scientist = a person who is trained in science

speed = how fast something is

store = to keep facts and information in a place for a longer time

strip = narrow piece

thread = a long thin string of cotton

thus = therefore, that is why

tiny = very, very small

tool = something that does a certain job

towards = in the direction of

track = two metal lines on which trains travel

turtle = a reptile that lives mostly in water and has a hard shell

useful = helpful

videotape = material that you record pictures and sounds on

weak = not very strong

wire = a very thin piece of metal through which electricity travels

x-rays = rays that can go through objects of your body and can be used for taking pictures of inside organs