OGUN DIGICLASS

SUBJECT: BASIC SCIENCE

TOPIC: MAGNETISM

MAGNETISM

LEARNING OBJECTIVES

- Explain the meaning of a magnet.
- State two (2) laws of magnetism.
- List two (2) uses of magnet.

INTRODUCTION

A magnet is a rock or a piece of metal that can pull certain types of metals towards itself.

The force of magnet is also called **magnetism**

Magnetism is a basic force of nature like gravity.

It works over a particular distance.

MAGNET

A magnet is a solid material or substance which can attract iron or steel materials to itself.

Magnets have a force which help them to attract objects. This force is called **magnetic force**.

Magnets are made of iron or steel.

All magnets are metals, iron or steel but not all metals are magnet.

TYPES OF MAGNET

A magnet can have the following shapes:

Ring or doughnut magnet

Horse shoe magnet

TYPES OF MAGNET

Wand magnet

Bar magnet

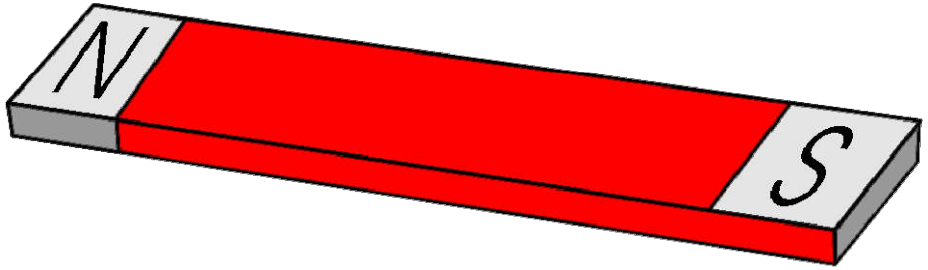
TYPES OF MAGNET

Cylindrical magnet

Ball magnet

CHARACTERISTICS OF MAGNET

- They can attract some materials such as: nails, pin, coin etc.
- They are usually made of iron or steel.
- They have two ends called magnetic poles.
- They can also repel other magnets.



MAGNETIC AND NON-MAGNETIC MATERIALS

Activity

Use a magnet to test which of the listed items can be attracted.

Items: Nails, piece of paper, biro, office pin, coin, pencil, iron fillings, plastic spoon, piece of wood and steel spoon.

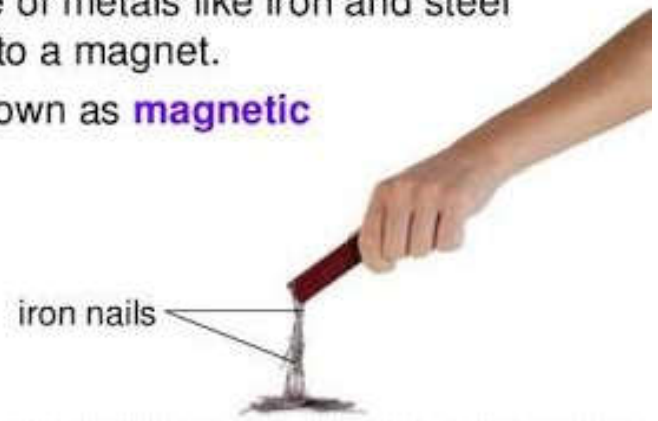
Name of Item	Attracted	Not Attracted
Nails	✓	
Piece of paper		✓
Biro		✓
Office pin	✓	
Coin	✓	
Pencil		✓
Iron fillings	✓	
Plastic spoon		✓
Piece of wood		✓
Steel spoon	✓	

Magnetic Materials

These are materials that can be attracted by a magnet.

Examples are: iron, steel.

- Which materials are attracted to a magnet?
  - Objects made of metals like iron and steel are attracted to a magnet.
  - These are known as **magnetic materials**.



Non-Magnetic Materials

These are materials that cannot be attracted by a magnet. Examples are: plastics, rubber, wood.

- All non-metals such as plastic, wood, paper, glass and clay cannot be attracted to a magnet.
- These materials are called **non-magnetic materials**.

Examples of non-magnetic materials:

paper

glass

plastic

rubber

wood

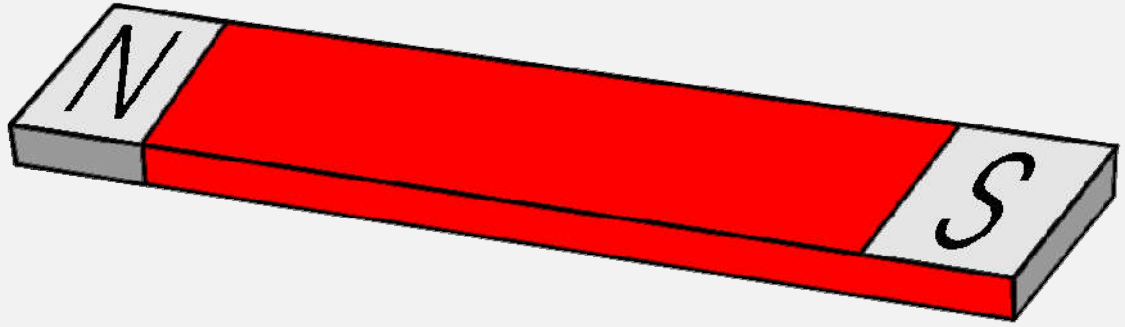
MAGNETISM

- Magnetism is a force that can attract (pull closer) or repel (push away) objects that have a magnetic material like iron inside them.
- Magnetism is also the ability of a material to attract iron and steel.

LAWS OF MAGNETISM

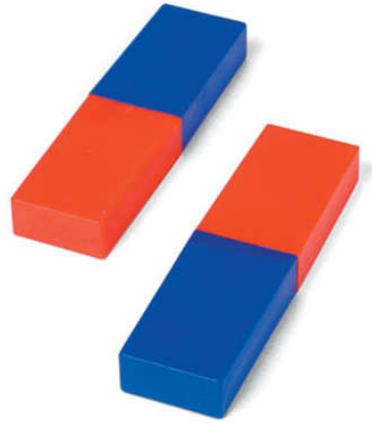
First Law

A magnet has two poles. The **north** and **south** poles.

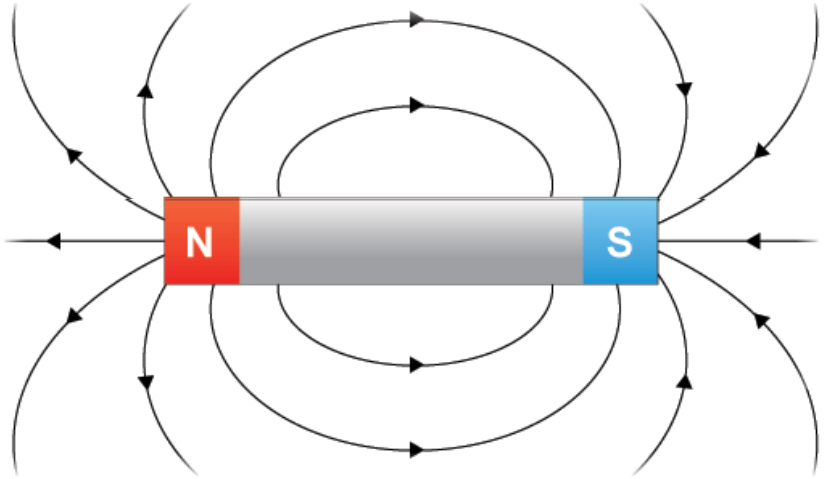


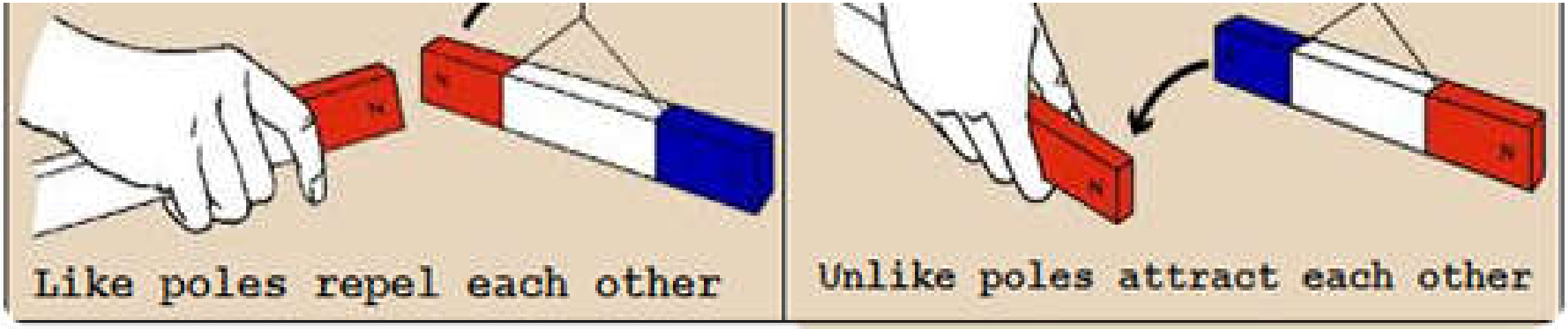
Every magnet has at least one north pole and one south pole.

POLES OF A MAGNET



- The blue end of a magnet is usually the south pole.
- The red end of a magnet is usually the north pole.





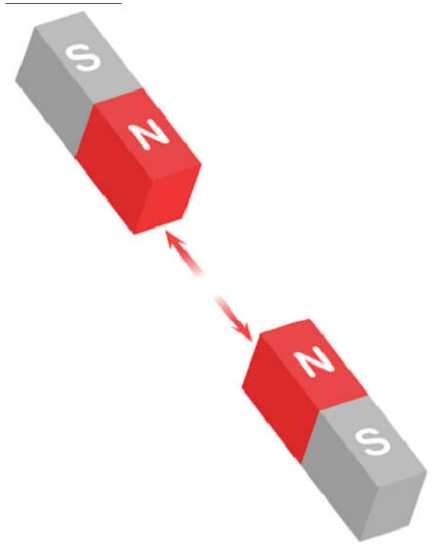
Second Law

- Like poles of a magnet repel each other.

  (North – North) or (South – South)

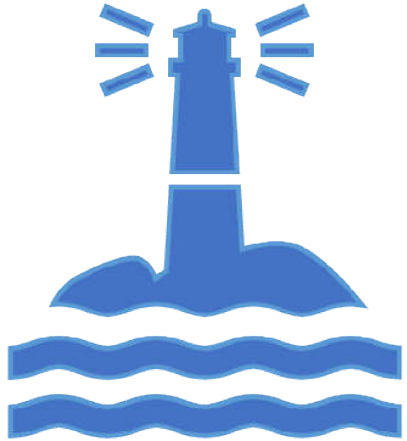
- If you try to put two magnets together with the same poles pointing towards one another, the magnets will push away from each other. We say they repel each other.

SAME POLES REPEL



In this picture two north poles are pushing away from each other (repelling each other).

ACTIVITY 1



Aim: To show that like poles of a magnet repel each other.

Materials: 2 bar magnets, table.

Procedure:

- Place the two bar magnets near each other such that the north poles of both magnets are beside each other.
- Record your observations.

Result: You will observe that when the north poles of both magnets are placed close to each other; they repelled each other.

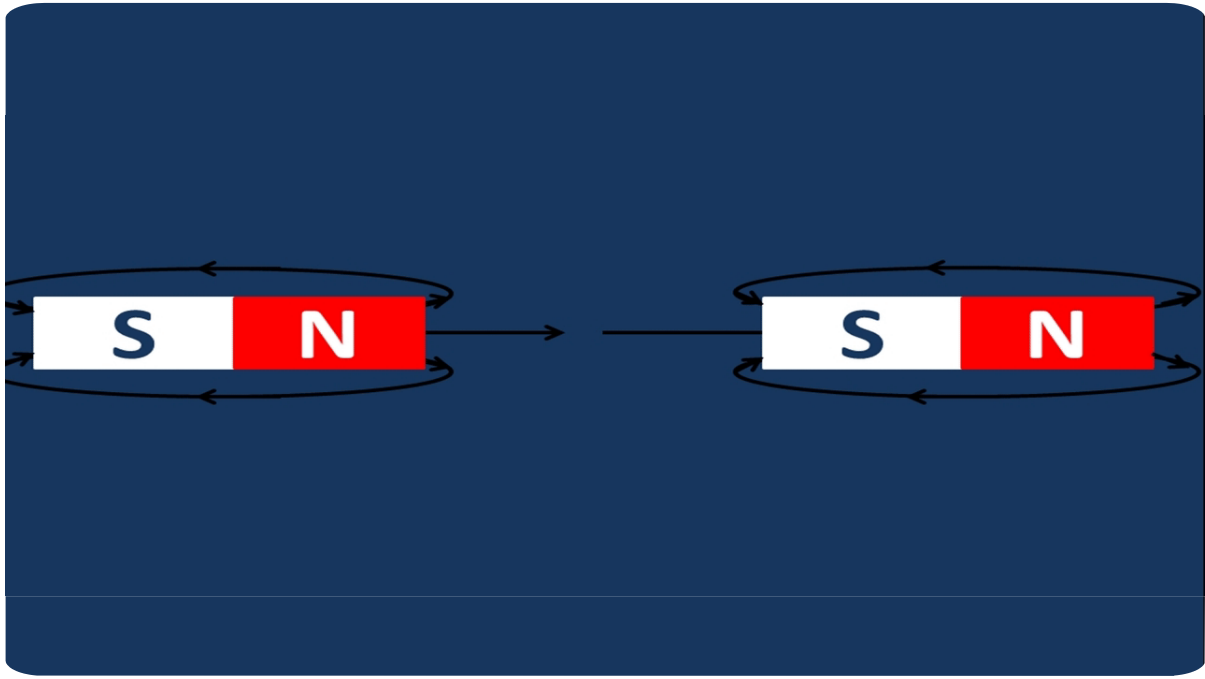
LAWS OF MAGNETISM

Third Law

- Unlike poles of a magnet attract each other.

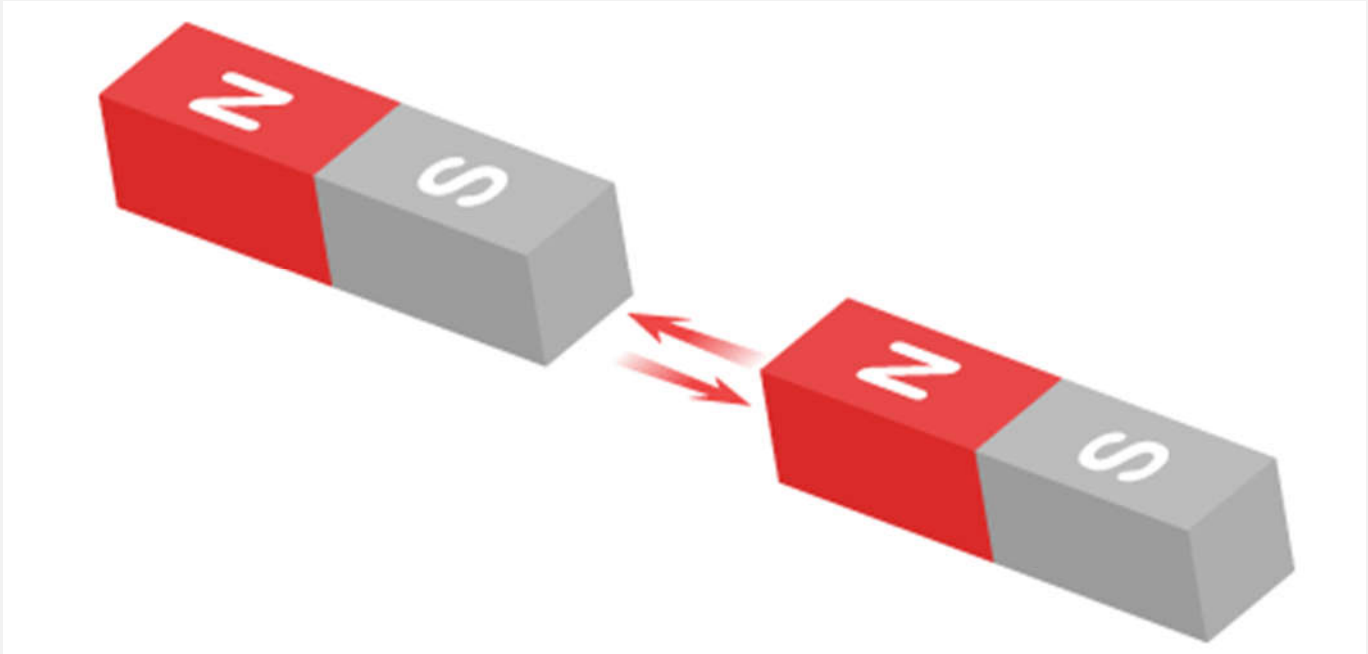
(North – South) or (South – North)

- If you put two magnets together with different poles pointing towards one another, the magnets will pull towards each other. We say they attract each other.



DIFFERENT POLES ATTRACT

When two magnets are close, they create pushing or pulling forces on one another.



ACTIVITY 2

Aim: To show that unlike poles of a magnet attract each other.

Materials: 2 bar magnets, table.

Procedure:

- Place the two bar magnets near each other so as to have the north pole of one beside the south pole of the other.
- Record your observations.

Result: You will observe that when the south pole of the second magnet is placed beside the north pole of the other magnet; the magnets attracted each other.

What did we find out?

- So now we know that “like” poles **repel** each other…
- And that “opposite” poles **attract** each other.

They do this because there is a

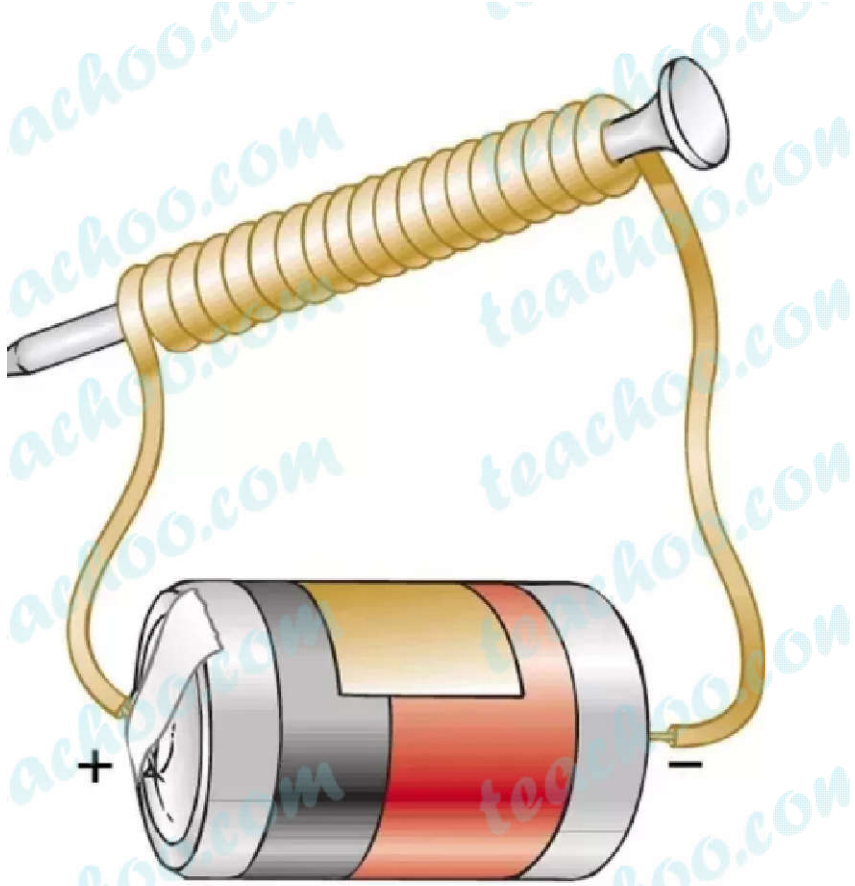
FORCE

between them.

CLASSES OF MAGNETS

Magnets can be classified based on how long they can retain their magnetism. These are:

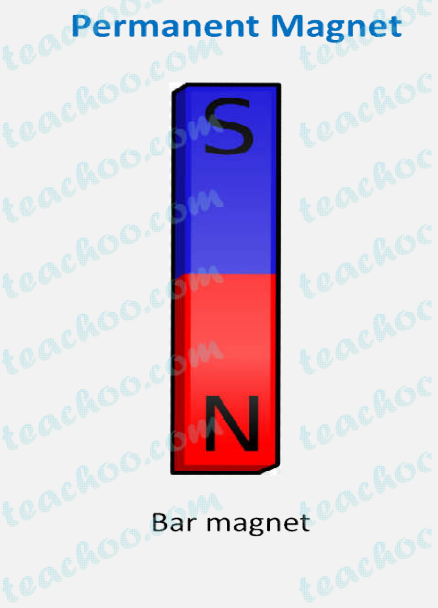
- **Temporary magnets**: These are magnets which easily lose their magnetism. They are made of iron.

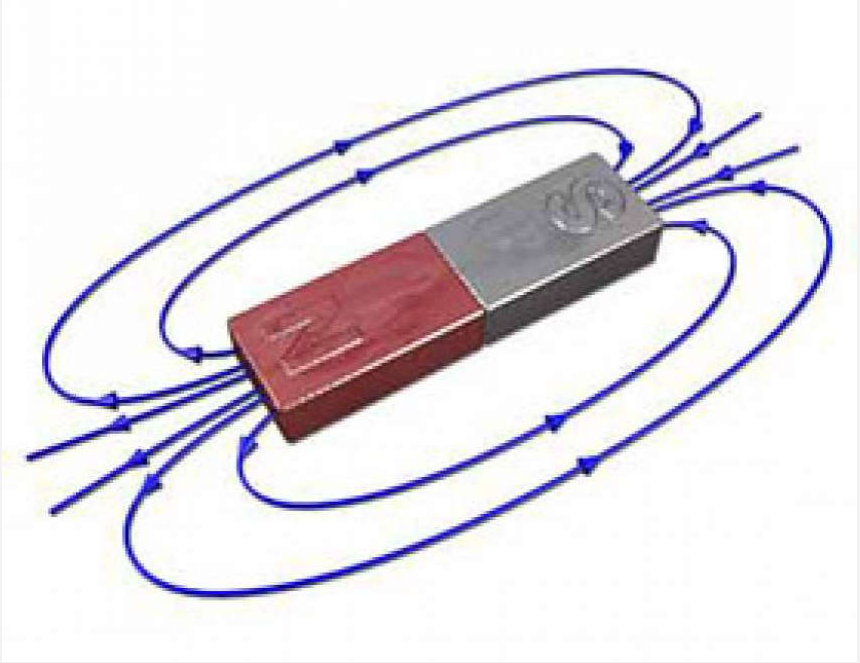


Electromagnet

CLASSES OF MAGNET

- **Permanent magnets**: These are magnets which can retain their magnetism for a long time. They do not lose their magnetism easily. They are made of steel.





USES OF MAGNETS

- Magnets are used for separating magnetic and non-magnetic substances.
- They are used for making compasses. Compasses are the instruments which help navigators and sailors to find their directions on the sea or on land.

USES OF MAGNETS

- Magnets form parts of the following materials: electric bell, radio, television, telephone, speakers and electric generator.

Uses of magnets

Magnets are in most electronic devices, in fact, anything that has a motor uses a magnet.

Televisions, computers, and microwave ovens all operate with magnets.

They are used to slow down roller coasters and subways.

Magnets are used to keep refrigerator doors closed.

More uses of magnets are found every day!

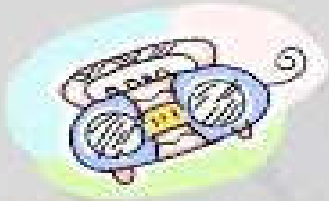
Other uses of magnets:

The edge of the refrigerator door is lined with a magnet. It holds the door to the metal frame.

Floppy disks are made of plastic and coated in magnetic particles. Floppy disks are used to save and retrieve information.

Doorbells use magnets too. The magnet pulls the hammer forward to strike the bell.

Compasses help people use the earths magnetic force to find their way.



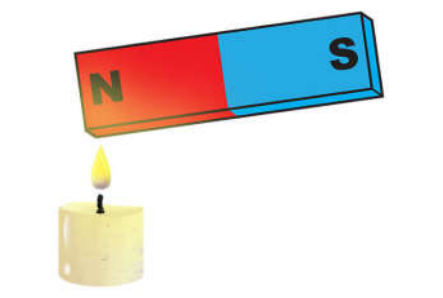
Credit cards. The thin, black bar on the back is coated with tiny magnets. It holds information.

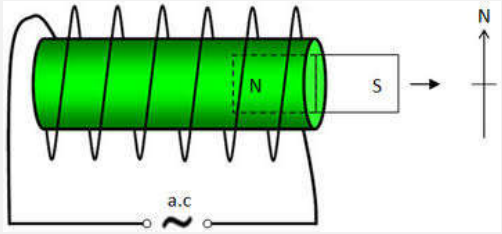
There are tiny magnets inside a stereo, telephone, vacuum cleaner and washing machine.

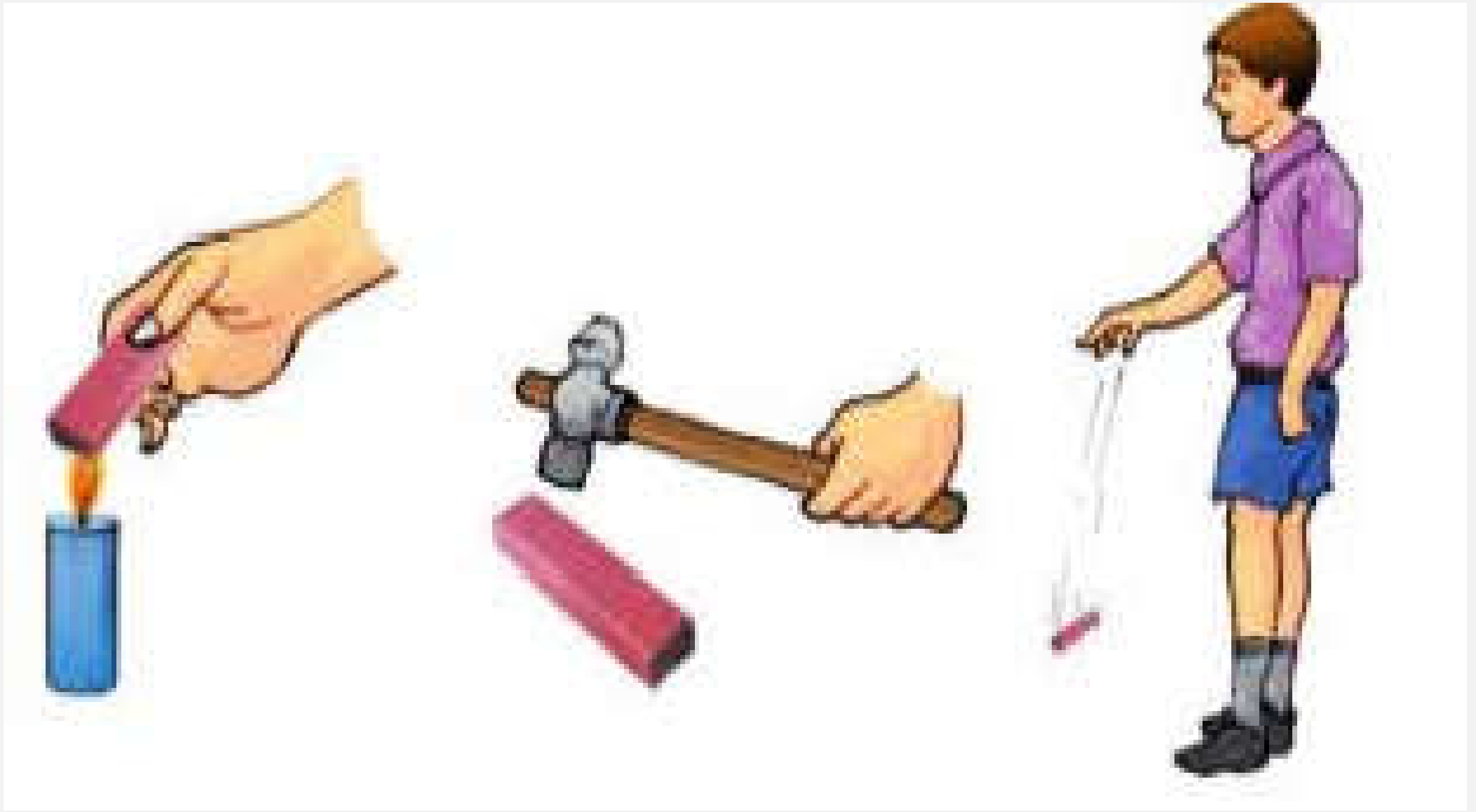
DEMAGNETIZATION

Demagnetization is the process of removing the metallic effects from a magnet. Magnets can be demagnetized by:

- Hammering on one end of the magnet.
- Heating the magnet very hard.
- Dropping the magnet repeatedly.
- Passing an alternate current through a magnet.







EVALUATION

- State two (2) laws of magnetism.
- How many classes of magnet do we have?

ASSIGNMENT

- Mention the classes of magnets.
- List three (3) uses of magnets.