4. Magnetism

Exercises

1 A. Question

Answer the following questions.

Classify the following substances as magnetic or non - magnetic.

copper, phosphorus, iron, cobalt, soil, water, silver, mercury, nickel, wood, oil.

Answer

Magnetic substances are those which are attracted by a magnet when substance is placed near magnet.

Non-Magnetic Substances are those which are not attracted by a magnet when substance is placed near magnet.

So here Magnetic substances are – Iron, Cobalt, and nickel

As these substances are attracted by a magnet when placed near it

Non-Magnetic Substances are – Soil, Water, Wood, Soil, Oil, Mercury, Silver, Phosphorus, copper

Because these substances are not attracted by a magnet when placed near it

1 B. Question

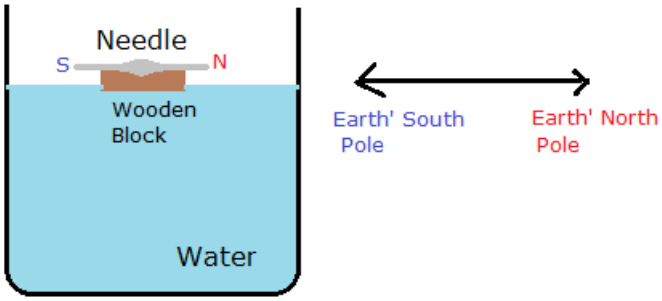
Answer the following questions.

In olden times, how was a magnet placed in a compass?

Answer

Whenever a magnet is kept in such a situation, that it is fee to move in any direction on the surface of earth, it aligns or orient itself such that north pole of magnet points towards North Pole of earth and south pole towards south pole of earth hence it indicates direction and act as compass. In olden times in order to place a magnetic needle in compass (A magnet in shape of needle or a magnetized needle acting as magnet), magnetic needle was supported on a wooden block and placed in water such that needle floats on water, as needle was free to turn, it would come to rest in the north –south direction of earth and act as compass.

As it has been shown in the figure



2. Question

Match the following.

Column A	Column B
(a) Compass	1. Maximum magnetic strength
(b) Cupboard	2. Like poles
(c) Repulsion	3. Bar magnet
(d) Magnetic poles	4. Magnetic needle

Answer

Column A	Column B	Explanation
(a)Compass	4.magnetic needle	As magnetic needle is placed inside a compass, which rotates and to come to rest such that North Pole of magnet points towards North Pole of earth and South Pole of earth hence it indicates direction.
(b) Cupboard	3. Bar magnet	Cupboard with doors or shutters has a bar magnet fitted in them at the frame and doors or shutter has a magnetic material like iron placed at the end of door or shutter, which while closing when brought close to the frame of cupboard closes with a click sound as door is pulled by frame as Bar magnet in frame of cupboard pulls the iron inside shutter.
(c) Repulsion	2.like poles	Any magnet has two poles i.e. North and South, like magnetic poles repel each other i.e. North Pole of a magnet repel North Pole of another magnet and South Pole of a magnet repel South Pole of another magnet when brought closer.
(d) Magnetic poles	– 1. Maximum magnetic strength	Magnet consists of two opposite poles i.e. North Pole and South Pole the two poles are at the two ends of magnet as shown in figure.  Now the maximum magnetic strength of magnet is near the poles as we know magnetic materials are attracted more easily and with more strength when placed near the pole of magnet and as we move towards the center of magnet attraction power decreases as magnetic strength decreases.

3. Question

Fill in the blanks.

(a) There is magnetic ..... between like poles.

(b) Stainless steel is a ..... substance.

(c) There is mutual attraction between ..... poles of magnets.

(d) There is maximum magnetic force near the ..... of a magnet.

Answer

(a) Repulsion

Explanation: Any magnet has two poles i.e. North and South, like magnetic poles repel each other i.e. North Pole of a magnet repel North Pole of another magnet and South Pole of a magnet repel South Pole of another magnet when brought closer.

(b) Non-Magnetic

Explanation: Stainless steel is not attracted by a magnet when placed near a magnet. And substances which are not attracted by a magnet when placed near it are called nonmagnetic substance.

(c) Unlike poles

Explanation: Any magnet has two poles i.e. North and South, unlike magnetic poles attract each other i.e. North Pole of a magnet attract South Pole of another magnet and South Pole of a magnet repel North Pole of another magnet when brought closer.

(d) Poles

Explanation: The maximum magnetic strength of magnet is near the two ends of magnet called the poles so maximum magnetic force is experienced at poles.

4 A. Question

Give reasons.

A magnetic needle is used in a mariner's compass.

Answer

Magnetic needle is used in a mariner's compass as Sailors use marine compass to locate directions.

Whenever a magnet is kept in such a situation, that it is fee to move in any direction on the surface of earth, it aligns or orient itself such that north pole of magnet points towards North Pole of earth and south pole towards south pole of earth, Magnetic needle in marine compass rotates to come to rest at north- south direction

This helps sailors to point north direction, with the help of which all other direction can be determined by mariner, and mariner can travel.

4 B. Question

Give reasons.

If a bar magnet is suspended vertically it does not hang in the north-south direction.

Answer

A bar magnet has property to come at rest at north-south direction or orient itself such that north pole of magnet poles toward north pole of earth and south pole of magnet toward south pole of earth but this happens if magnet is allowed to swing freely along Horizontal Surface of earth, when a bar magnet is suspended vertically, it is not allowed to move freely in Vertical Plane of earth as Gravitational force is acting on magnet and it can’t swing freely so as to so it is not hang in north –south direction.

Activities

1. Question

Take a paper clip. Tie a fine black thread to it. Tie a knot to the other end of the thread and stick it to a table top. Now, bring a bar magnet above the clip. The magnet will lift the clip. Keep raising the bar magnet gradually. The clip, too, will rise till the thread becomes straight. If the magnet were hidden what would you see ? A clip that hangs in mid-air !

Answer