



Materials and their properties Year 4

Making Connections

Some substances are **insoluble**. This means they cannot dissolve in a solvent. Sand is an example of an insoluble substance. If you mix sand with water, the grains of sand are not affected, and we can still see them.



Solid particles are very close together.

Dissolving is what happens when a **soluble** substance is broken down into smaller particles by a **solvent**.

A solvent can be a liquid, solid or gas. They dissolve soluble substances, which are called **solutes**, to make a **solution**.

The most common solvent is water. Salt and sugar are both common solutes. When they are mixed with water, it looks like they disappear!

Salt and sugar grains are made up of large groups of tiny particles, called molecules. The water breaks these groups up. The salt and sugar molecules are still there but are now dissolved into the water.

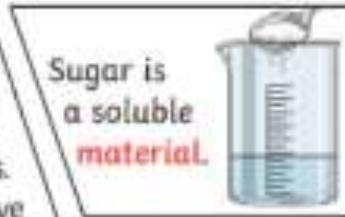
This mixture is now a solution.



William Gilbert (1544-1603) was an English scientist and physician who is credited by many as the "father of electricity and magnetism". When he observed that magnetic forces often produced circular motions, he began to connect the phenomenon of magnetism with the rotation of the earth. This led to his discover of the earth's own magnetism, and provided the theoretical foundation for the science of geomagnetism.

Key Vocabulary	
materials	The substance that something is made out of, e.g. wood, plastic, metal.
solids	One of the three states of matter. Solid particles are very close together, meaning solids , such as wood and glass, hold their shape.
liquids	This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.
gases	One of the three states of matter. Gas particles are further apart than solid or liquid particles and they are free to move around. A gas fills its container, taking both the shape and the volume of the container. Examples of gases are oxygen and helium.

Dissolving
A solution is made when **solid** particles are mixed with **liquid** particles. **Materials** that will dissolve are known as soluble. **Materials** that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.



KNOWLEDGE ORGANISER

Magnets are attracted to some metals. They are not attracted to **all** metals.

Iron, nickel, cobalt



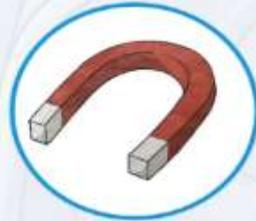
Copper, mercury, gold



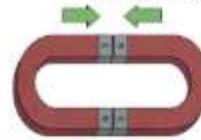
Aluminium, fabric, glass, plastic, wood



- Some pennies may have been magnetic – this is because some are made with steel which is magnetic but those made of copper are not.

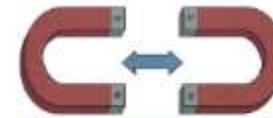


A magnet is a metal which attracts or repels other materials. Magnetism is the force of magnets.



Attract

Opposite poles of a magnet attract. North attracts south and south attracts north. The magnets will feel like they are being pulled together.



Repel

Poles which are the same will repel one another. North repels north and south repels south. The magnets will feel like they are being pushed apart.



North and south poles

These are the magnetic forces contained at the ends of a magnet.



Magnetic force

A magnetic force is caused by electrical charges and can either cause two magnetic objects to repel or attract.



Magnetic materials

Examples include iron, nickel and cobalt.



Non-magnetic materials

Examples include wood, rubber, glass and gold.

The water cycle is the constant movement of water from one place and state to another:

- Evaporating:** water in water stores, such as seas and lakes, is heated by the Sun and evaporates into water vapour.
- Condensing:** water vapour cools as it rises and condenses to form clouds; tiny liquid droplets of water.
- Precipitation:** water falls from the clouds in a liquid state (e.g. rain) or a solid state (e.g. snow).
- Run-off:** precipitation runs off the land into rivers and streams and back to water stores like the sea.

