

Materials Knowledge Organiser

Key Vocabulary	
materials	The substance that something is made out of, e.g. wood, plastic, metal.
conductor	A conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (they conduct heat) and electrical conductors (they conduct electricity).
insulator	An insulator is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical insulators .
transparency	A transparent object lets light through so the object can be looked through, for example glass or some plastics.

Key Knowledge

Different **materials** are used for particular jobs based on their properties: electrical **conductivity**, flexibility, hardness, **insulators**, magnetism, solubility, thermal **conductivity**, **transparency**.



For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.



Hardness

Hardness is a property of materials. It is a measure of how difficult it is to permanently change the shape of a material by **compressing** (squashing) it. If it is difficult to change the material's shape, then it has high hardness. If it is easy to change its shape, it has a low hardness.

Testing for transparency

Hold the material up to one of the lights in your classroom and test if you can see through it. If so, it is transparent.



Testing for strong thermal conductivity

Place the object so that one end of the object is in the water and the other is not. If the end of the object that is out of the water starts to feel cold, the material is a strong thermal conductor.

Testing for magnetism

Place a magnet next to the material. If the magnet and the material are attracted to each other, then the material is magnetic.

Metals



These materials are both thermal conductors and electrical conductors. They are hard and strong. They can be moulded or hammered into shape. Many, but not all, of these materials are magnetic. They are waterproof but can be damaged by water over time.

Fabrics



These materials are usually thermal and electrical insulators. They can be made from natural or artificial fibres. They are usually soft to the touch and flexible. They can be dyed to give them different colours. Some, but not all of them, are waterproof. They are not magnetic.

Plastics



These materials are synthetic. They can be dyed to give them different colours. They are waterproof. These materials can be made rigid or flexible, soft or hard and can be moulded into different shapes. They are electrical and thermal insulators. They are not magnetic.

Glass



This material is transparent. It is hard and brittle. It is waterproof and is not damaged by water. This material is a thermal conductor but is an electrical insulator. It is not magnetic. It can be coloured to give it a coloured translucence.

Wood



This natural material is made from trees. It is a thermal and electrical insulator. There are different types of this material, and can be rigid or flexible. This material is attractive and can be cut and sanded to shape. It can be waterproof if treated and it is not magnetic.

Leather



This material is made from the processed skin of animals, usually cattle. The skin is made into this material in a process called tanning. It is tough and flexible. If treated correctly, it is waterproof. It is not magnetic. It is long-lasting but will eventually wear away.

Key Individuals

Leonardo da Vinci

Leonardo was known as an expert scientist, inventor, engineer, architect, writer, sculptor and painter. His most famous painting, The Mona Lisa, is thought to be the best known and most visited work of art in the world.



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