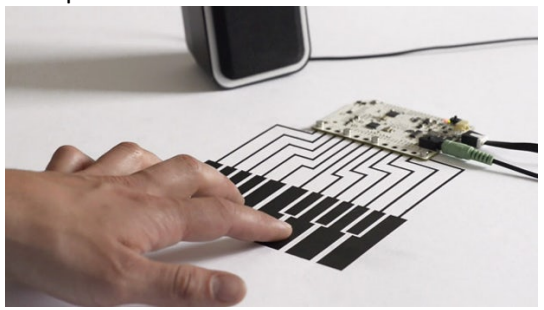
Upper Key Stage 2: Properties of Materials

Key Vocabulary

thermal	Relating to heat.
electrical	Relating to electricity.
insulator	Will stop energy, such as heat or electricity transfer through it.
conductor	Will let energy, such as heat or electricity transfer through it.
solid	The state in which matter maintains a fixed volume and shape.
liquid	The state in which matter adapts to the shape of its container.
gas	The state in which matter expands to occupy the volume and shape of its container.
hardness	How solid, firm or rigid a material is.
transparency	How much light passes through an object.
transparent	A material that lets all light through.
translucent	A material that lets some light through.
opaque	A material that lets no light through.
magnetic	A material that is attracted to magnets.
permeable	Will allow liquids and gases pass through it.
impermeable	Will stop liquids and gases pass through it.
soluble	A substance that will dissolve.
flexible	A material that can bend easily.
absorbent	Is able to soak up a liquid.

What amazing new materials have been invented?

Electric ink – These inks are metal free and have conducting abilities. They will play a big role in the production of sensors, screens, and even batteries for most pieces of gadgets today. This kind of ink is also much easier to make than conventional inks for electronics, adheres to more kinds of materials, and can even be printed simply by using a desktop device.

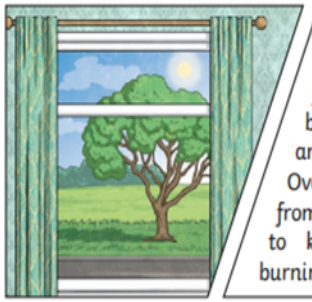


Grouping properties		
Property	Yes	No
Electrical conductor	copper, aluminum, gold, silver, steel	glass, air, plastic, rubber, wood, oil, diamond
Magnetic	steel, nickel, cobalt, iron	paper, glass, plastic, wood
Transparent	glass, water, clear plastic	wood, rubber, steel, copper
Impermeable	plastic, rubber, metal, glass	Tissue, sponge, fabric

Upper Key Stage 2: Properties of Materials

Materials

Different materials are used for different jobs based on their properties. Properties such as: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity and transparency. Can you think of any others?



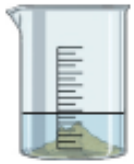
For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.

Mixing materials – Dissolving

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.

Sugar is a soluble **material**.

Sand is an insoluble **material**.



Types of Materials	
Metal -Metals are made from rocks. -Metal is strong and shiny. -Metals include aluminum, iron and steel.	**Glass** -Glass is made from fine sand. -Glass is very strong and clear (transparent). -Glass is used for windows and glasses.
Wood -Wood is made from trees. -Wood is a hard and strong material. - Woods include oak, pine and ash.	**Plastic** -Plastics can be made from lots of different materials. -Plastic can be tough or bendy, and so it is used for many different purposes.
Water -Water is a natural material, found all over the world. -Water is clear and can take many shapes. It can be frozen into ice or heated into gas.	**Paper** -Paper is made from trees. -Paper is normally thin and can be made into different shapes. Lots of different things are made from paper.

Spencer Silver

Born February 6, 1941 - Died May 8, 2021

In 1968, Spencer Silver was a senior scientist working to develop new classes of adhesives at 3M when he discovered an acrylic adhesive with unique properties. It was formed of tiny spheres that provided a pressure-sensitive adhesive with a high level of tack but a low degree of adhesion. Art Fry, a researcher at 3M, learned of the adhesive several years later. He coated paper with it and made repositionable notes, and the concept of Post-it® Notes was created.