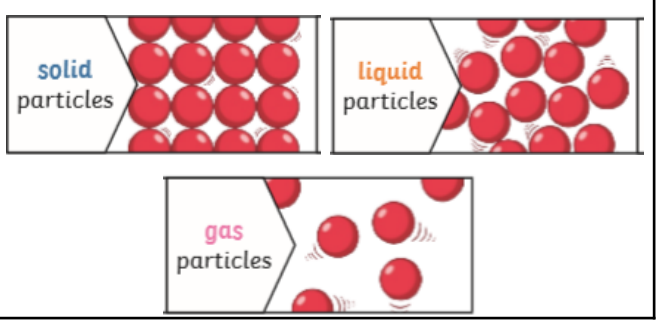
Knowledge Organiser

Science Focus	Properties and changes to materials	Year 5	Spring 2

What? (Key Knowledge)

Materials are chosen for a purpose by their properties; electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency.	Glass is used for windows as it is hard and transparent. Oven gloves are made from a thermal insulator, to keep the heat from burning your hands.
Particles – including states of matter	That all materials are made of particles and in each they are arranged differently. See the diagram below. Solid, liquid and gas are know as states of matter.
Changes of state	The state of matter can change. For example, a liquid can be frozen and then it becomes a solid. When water is boiled, it turns into water vapour, which is a gas
The state of some matter can be reversed.	Sieving – separates particles by size, smaller pieces will move through the sieve. Filtering – solid particles get caught in the filter paper whilst the liquid can go through. Evaporating – the liquid changes into a gas leaving the solid particles behind.
The state of some matter is irreversible.	Irreversible changes often result in a new product being made from old materials. For example, burning wood produces ash, mixing milk and vinegar produces casein plastic.

Diagrams and Symbols



Possible experiences

- Baking – making bread, pizza etc.
- Melting chocolate and reforming into another shape.
- Freezing liquids and watching it melt.
- Making jelly.
- Melting wax and watching it reform.
- Cornflour – link back to forces. How the matter changes when a force is applied to it.

Statutory Requirements

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- Understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Demonstrate that dissolving, mixing and changes of state are reversible changes
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

What? (Key vocab)

Spelling	Definition
Material	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 that 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 and liquid particles and are free to move around. Examples of gases are oxygen and helium.
Melting	The process of heating a solid until it changes to a liquid.
Freezing	When a liquid cools and turns into a solid.
Evaporating	When a liquid turns into a gas or vapour.
Condensing	When a gas such as water vapour cools and becomes a liquid.
Conductor	A conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (heat) and electrical conductors.
Insulator	An insulator is a material that does not allow heat or electricity to travel through it. Wood and plastic are both thermal insulators.
Transparency	A transparent object lets light through so that the object can be looked through, for example some glass and plastics.