Big Question:
How can materials be changed?

Exeter

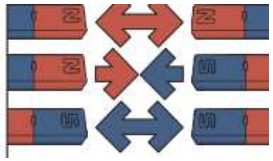
Key Vocabulary:

Dissolve: *When a solid is incorporated into a liquid to form a solution.*
Solution: *A type of mixture when one substance is dissolved in another.*
Evaporate: *Turn from liquid into gas through heating.*
Melt: *The process of heating a solid until it changes to a liquid.*
Condense: *When a gas cools and turns into a liquid.*
Solute: *The solid that has dissolved in a liquid.*
Solvent: *The liquid in which a solid is dissolved in to form a solution.*
Reversible: *Capable of being changed back to its original form.*
Irreversible: *Not able to be undone.*
Transparency: *A transparent object lets light through.*
Conductor: *A material that heat or electricity can easily travel through*
Solid: *Solid particles are very close together, meaning solids hold their shape.*
Liquid: *This state of matter can flow and take the shape of the container because the particles are more loosely packed that solids and can move around each other.*
Gas: *Gas particles are further apart than solid or liquid particles and are free to move around. A gas fills its container, taking both the shape and volume of the container.*

Knowledge from Y3 that will help me answer the big question:

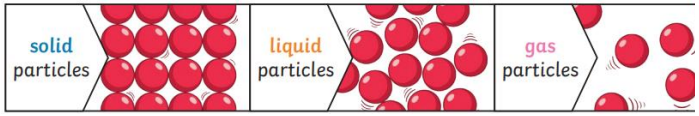
Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. The metal iron is magnetic.

Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force.
Magnets have two poles. Like poles (North and North or South and South) repel. Opposite poles (North and South) repel.



Magnetic materials are attracted to magnets.
All magnetic materials are metal.
Not all metals are magnetic.

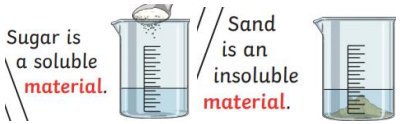
New knowledge that will help me answer the big question:



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.

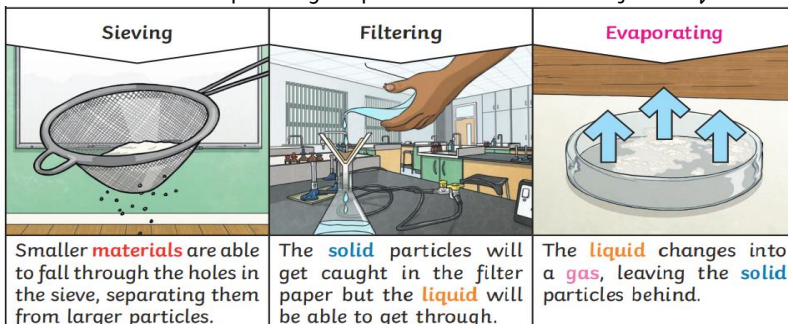
New knowledge that will help me answer the big question:

Very hot and very cold materials can burn the skin so heating and freezing materials should be done safely.
Some materials (solutes) dissolve in liquid (solvents) to form a solution. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble.



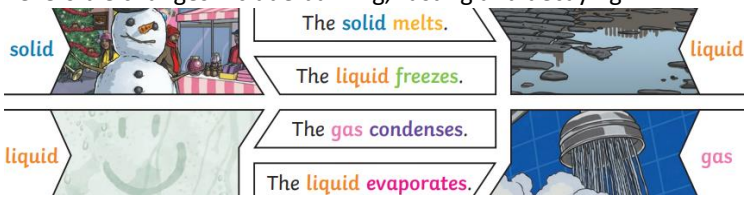
Some mixtures can be separated by sieving, filtering and evaporating.

- Sieving: Separates large solids from liquids and some solids from other solids.
- Filtering: Separates small solids from liquids
- Evaporating: Separates dissolved solids from liquids.



New knowledge that will help me answer the big question:

Reversible changes include heating, cooling, melting, dissolving and evaporating.
Irreversible changes include burning, rusting and decaying.



As a scientist, the essential knowledge I need to answer the big question is:	**Date**
Very hot and very cold materials can burn skin. Heating materials should be done safely.	
Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism.	
Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids.	
Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating.	
Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions.	
A material's properties dictate what it can be used for. For example, cooking pans are made from metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the contents of the pan.	
A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding.	
An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time.	
The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected.	