Separating Mixtures and Changing Materials

What you've learnt already

In Year 4, the children were able to group and compare materials (e.g. solids, liquids and gases). They observed that some materials change state when they are heated or cooled. They also learnt about the process of The Water Cycle which includes evaporation and condensation.

In KS1 the children learnt the names of materials and identified the suitability of materials.

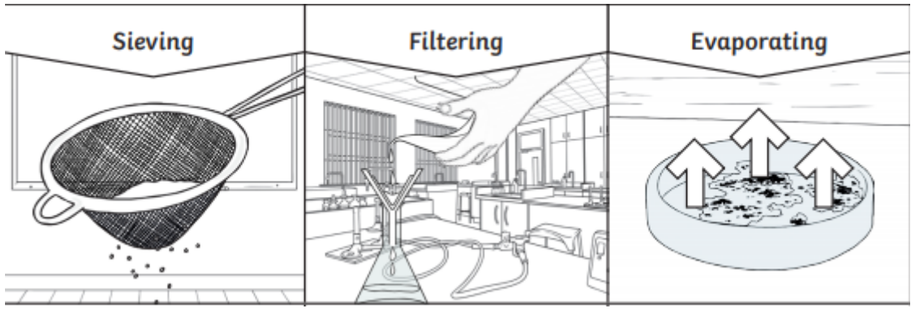
Choices

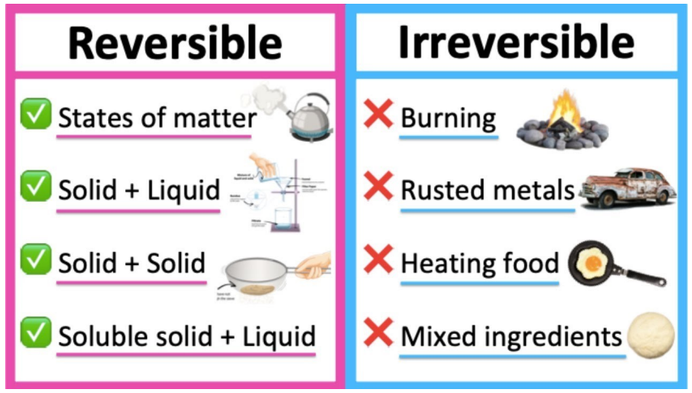
The children will have choices of the selection of materials, which job roles they take on during investigations. Children will be encouraged to take on a range of roles throughout the year to encourage independence and collaboration.

Key Vocabulary

Solid	Firm and stable shape.
Liquid	A substance that flows freely but is of constant volume.
Gas	A substance which expands freely to fill the whole of a container. No fixed shape or volume.
Dissolve	Becomes a liquid. This forms a solution.
Solution	A liquid mixture.
Filtering	Pass through a device to remove unwanted material.
Sieving	Remove unwanted items or separate items.
Evaporating	Turn from liquid into a gas.
Soluble	A material that dissolves in a liquid to form a
Insoluble	A material that does not dissolve in liquid.
React/Reaction	Two or more materials mixed together change to produce new materials
Contamination	When something clean gets mixed with something dirty, making it unclean or unsafe.
Comparative	Looking at the similarities and differences.
Reversible	Able to be turned back/reversed.
Non-reversible	Not able to turn back/not able to reverse.

Diagrams





Lesson Sequence

L1	Identify how we can separate mixtures.
L2	Observe what happens when we mix liquids and solids.
L3	Identify what makes a difference to how fast sugar or salt dissolves.
L4	Understand how we can clean contaminated water.
L5	Understand what makes a change non-reversible.
L6	Identify how much gas can be produced from a non-reversible change.

Key Knowledge

Solid, dry mixtures of materials can be separated by sieving.

Some solids dissolve in water while others do not. Materials that do not dissolve can be separated from a liquid by filtering.

Solids which dissolve do so faster in certain conditions and can be retrieved from a solution if the liquid is evaporated.

Filtering processes can be used to decontaminate polluted water and make it useful for a variety of

purposes.

Some changes of state are reversible, and others are non-reversible.

Non-reversible changes result in the formation of new materials, in this case carbon dioxide gas.

Materials

What does sieving do to a material?	Can you give an example of a reversible change?	Define a ‘liquid’.	Explain the difference between solid particles and gas particles.
When you completed your investigation on thermal insulation, what did you notice over time?	Can you name any materials that are conductive?	What investigation would you lead on to show an irreversible change and why?	What is a solution?
If you needed to filter a mixture. What would you use and why?	Draw a diagram to represent a solid, liquid and gas.	What does ‘evaporating’ mean?	Can you explain what ‘dissolve’ means and give an example of the process?
Talk to me about your ice investigation. What materials were the most suitable and why? Use evidence.	Describe the difference between ‘dissolving’ and ‘evaporating’.	What materials are in a plug and what are their purpose/use?	What indicators may there be to show an irreversible change?

One Point	Two Points	Three Points	Four Points