What should I already know?

I can compare and group materials together according to their state.
I know that some materials change state when they are heated or cooled.
I can identify the part played by evaporation and condensation in the water cycle.

Enquiry Question

Which changes are reversible and which are irreversible?

Vocabulary

Mixture	Combining two or more substances together; each substance stays the same.
Change of State	changing something from one state to another.
Dissolve	when a substance becomes part of a liquid.
Soluble	can dissolve in a liquid
Insoluble	cannot dissolve in a liquid
Solution	made by dissolving a substance in a liquid
Substance	what something is made up of
Filter	used to remove dirt or other solids from liquids or gasses.
Sieve	has mesh or holes to separate finer particles from coarser ones or solids from liquids.
Reversible change	when a change can be undone to get the same substances back again
Irreversible change	when a change cannot be undone to get the same substances back again
Chemical reaction	a change where new substances are made

Reversible and Irreversible Changes

Dissolving

Some substances can dissolve in a liquid. Substances that dissolve are soluble.
Substances that are soluble can dissolve in a liquid to make a solution. Rate of dissolving can depend on liquid at a higher temperature and by stirring.
Some substances do not dissolve in a liquid. A substance that does not dissolve in a liquid is insoluble

Filtering and sieving

Some mixtures like sand and water do not dissolve. We call sand insoluble. Filtering can be used to separate mixtures that are made up of an insoluble solid and a liquid. The filter paper has tiny holes in it. The holes let the water pass through but not the sand. The sand is separated from the water.

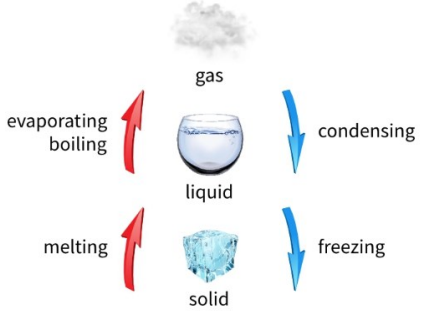
A sieve can be used to separate solids of different sizes. A sieve has larger holes than filter paper to let small solids pass through.

Solutions and Evaporation

Sand is insoluble in water. The sand does not dissolve into the water. The sand and water did not make a solution.
Sugar is soluble in water. The sugar dissolved into the water. The sugar and water made a solution.
Both are mixtures. We have not created any new substances and they can be easily separated. The sugar and water solution cannot be separated using filtering because sugar is soluble. The sugar dissolves in the water and can pass through the holes in the filter paper.
Leaving the sugar and water solution in a dish over time will allow the water to evaporate. The sugar will be left behind in the dish and the solution will be separated.
Raising the temperature of the solution will speed up the process.

Reversible Changes

When water is cooled overtime, it freezes to forms ice. This can be reversed by taking the ice out the freezer, allowing it to melt overtime. Changes of state are reversible change.
Liquid water can be heated to turn it into steam. Steam can be cooled to turn it back into liquid water.



Irreversible Changes-Burning

Burning is a chemical reaction where a substance is heated in air to make a new substance. Burning is an irreversible change as it cannot be undone. Burning is a chemical process, since new substances are made. Heating does not always make a new substance so is not a chemical reaction, like melting butter. Heating is a reversible change which can be reversed by cooling.

Irreversible Changes-Acids

Sometimes when one substance is added to another,
a chemical reaction takes place.
Chemical reactions are irreversible changes. For example, bicarbonate of soda is a white powder that is used in baking. Vinegar is an acid used in cooking to flavour and preserve food. A new substance is formed in a chemical reaction, in this case a gas is formed.