Explanation texts	
Title using how or why	
Subheadings	
Parenthesis	
Diagrams	
Causal conjunctions (because, therefore, as a result...)	
Technical language	
Time adverbials	

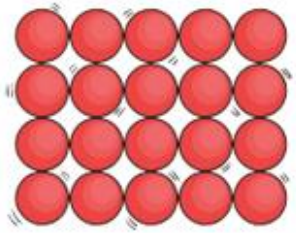
How Do Materials Change State?

Materials are made of tiny molecules (also known as particles) and can exist in three forms, which we classify as solids, liquids and gases. In scientific terms, these are called the three **states of matter**. Varying the temperature or pressure of a material's surroundings affects its state.

The Three States of Matter

- **Solid**

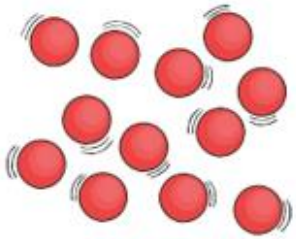
In a solid, the molecules' positions are quite rigid and they cannot move around much, if at all. As a result, solids (for example, ice) hold their shape.



molecules within a solid

- **Liquid**

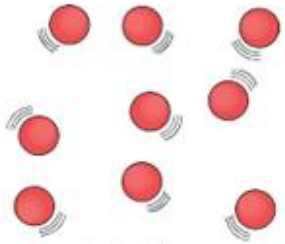
A liquid material (such as the water in a tap) has more loosely-packed molecules. Because they have more space, the particles can move around and the material flows to take up the shape of any container.



molecules within a liquid

- **Gas**

A gas's molecules are spaced very widely apart and bounce around freely to occupy the available space. Consequently, they will spread out as far as possible and seem to disappear if they are not trapped in a container.



molecules within a gas

Most materials, in everyday conditions, appear in only one state. However, many can possibly change between these three states according to alterations in their environment. For example, we can manipulate materials into changing states through the processes of heating and cooling.

Changing States

- **Evaporation**

Evaporation refers to the process of a liquid gradually turning into a gas (vapour) at its surface as it is gently warmed by air currents. This is how water from the oceans becomes the water vapour in the air.

- **Condensation**

Condensation is the scientific term for the process of a gas turning into a liquid, which happens when it is cooled. An example of this is when water vapour – the gas form of water – cools and returns to its liquid state. It is possible to see this process if water is boiled in a kettle. As the boiling water vapour from the spout meets cooler air, it condenses and becomes microscopic droplets – steam. If the steam then touches a cold surface such as a mirror, these droplets come together and the water reverts to its liquid state, dripping from the mirror.

- **Boiling**

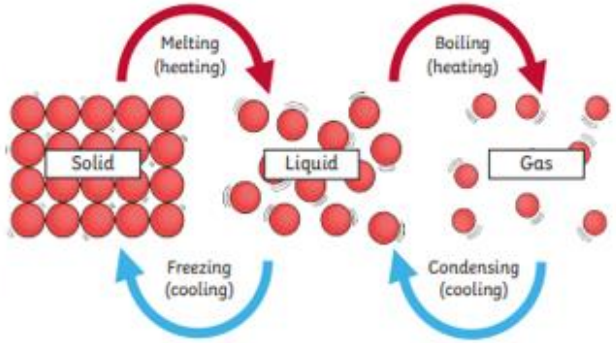
When a liquid is heated to its boiling point, it turns immediately into a vapour. Each liquid has a different boiling point. Water boils at 100°C. The material nitrogen, which is a naturally occurring as a gas, boils at almost -200°c! When water boils, it returns from its liquid state into water vapour. Steam, which is what we see above a boiling kettle's spout, is a mixture of water vapour and tiny droplets of water.

- **Freezing**

In order to turn a liquid into a solid, it must be cooled, causing the molecules to slow down and assume a fixed position. When water is cooled down to 0°C, it solidifies (turns to ice). Interestingly, ice is the only solid that is less dense than its liquid form and therefore floats in water. Why not try it with an ice cube in your next glass of water to see?

- **Melting**

Melting means heating a solid until the molecules can move about again, which will turn it into a liquid. Just like boiling points, each material has its own melting point, although these may vary drastically. For instance, chocolate will melt at a relatively low temperature. You could try to refrigerate a chocolate button then hold it in your hand and see what happens. Other materials, such as gold, require very high temperatures of over 1000°C!



A diagram to show the cycle of the states of matter

Materials can appear naturally at different states depending on their environment. Otherwise, we have to deliberately alter the temperature or pressure to force materials into changing state. There are a number of different ways we can utilise changing the state of a material, such as freezing food to keep it fresh, boiling water to purify it for drinking or melting gold to form it into jewellery.

Explanation texts	
Title using how or why	
Introductory paragraph	
Subheadings	
Pictures	
Numbered steps	

How is Ice Cream Made?

Ice cream is yummy to eat. We like to eat ice cream when the weather is hot and we like it for our puddings. Have you ever wondered how ice cream is made? This explanation will tell you how.

Mixing the Ingredients

Ice cream is made with milk and cream and sugar. First, all of the ingredients are mixed together. Then, the mixed ingredients are heated up to kill off any germs.

Flavours and Colours

The flavours and colours are added next. Mint flavour ice cream is green. Strawberry flavour ice cream is pink.

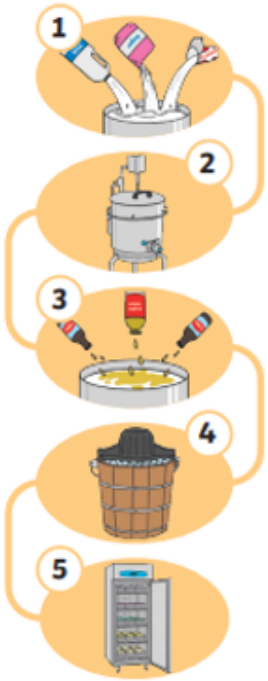
Frozen and Whipped

The mix is then frozen and whipped at the same time. This helps to put air into the ice cream. This makes it softer.

Blast Freezer

Now the mix looks like ice cream. It is put into tubs and put into a blast freezer. This machine freezes the ice cream at a very cold -40 degrees. That is as cold as the North Pole in winter.

How Ice Cream is Made?



1. **Ingredients**
Milk and cream and sugar are mixed together.

2. **Heating it Up**
The mix is heated up to very high temperatures. This kills the germs.

3. **Flavours and Colours**
Yummy flavours are added.

4. **Frozen and Whipped**
The ice cream is put in a special barrel that mixes and freezes it at the same time.

5. **Blast Freezer**
The ice cream is put into tubs and frozen at -40 degrees.

Your ice cream has been on quite a journey before you unwrap it.

Explanation texts	
Title using how or why	
Introductory paragraph	
Subheadings	
Parenthesis using brackets, commas or dashes	
Diagrams	
Causal conjunctions (because, therefore, as a result...)	

How Can the Snoozatron Help You Sleep?

When Wallace is struggling to sleep, he activates his 'Snoozatron' device. This remarkable contraption will help any insomniac inventor return swiftly to the land of nod. Would you like to know how it works? Then read on...

Auto-Comfy Bed

How It Works

Finding that he's wide awake in the middle of the night, Wallace pulls the big, red lever (next to his bed) that activates the machine; immediately, an alarm rings in Gromit's bedroom. As a result, his faithful assistant wakes up, retrieves a sheep costume from the wardrobe where it's kept and puts it on.

Meanwhile, back in Wallace's room, several mechanisms spring into action: giant mechanical hands – covered in soft fabric – bounce out from under his bed, re-tucking his covers; two huge leather pads appear and begin to push and plump the pillows from both sides (see illustration), before both devices disappear again. A pair of pincers then swings down and deposits a cosy hot water bottle on Wallace's lap. This is accompanied by another arm, which passes him his favourite teddy bear. As a consequence of all these events, Wallace starts to feel warm and comfortable again. At the same time, the picture on the wall nearby folds down to reveal a record player, which subsequently begins to play soothing music. Additionally, the sound of lambs bleating can be heard.

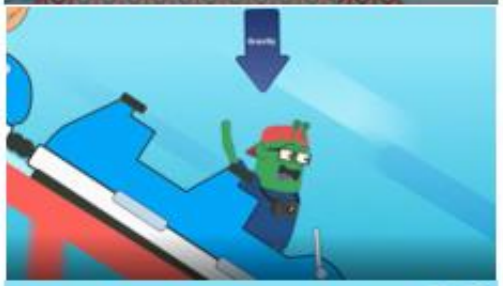
At this point, Gromit is sleepily waiting in the kitchen, with a cup of tea, because he knows he'll soon be called to action. A hatch drops open above him and Wallace calls down, "Ready Gromit!" Gromit sighs. Wearily, he steps back onto a circular platform, which is in turn mounted on a massive spring. Suddenly, he is catapulted through the hatch into Wallace's room and up past the end of the bed, before falling back and rebounding on the platform.

This final process is repeated over and over. Every time 'Gromit the sheep' appears, Wallace counts: "One, two, three..." until he starts to feel sleepy again - the Snoozatron can reliably bounce Gromit up to 9999 times!


KE


PE
KE


PE
Conversion
KE




PE
KE


Acceleration


Deceleration

Causal conjunctions can be:

Subordinating conjunctions

because
since
even though
as
now that

Coordinating conjunctions

so
yet

Adverbs/ Adverbials

accordingly
consequently
therefore
hence
as a result