

## Changing states of matter – Melting Points

Solids, liquids and gases are called the three states of matter. Materials can be changed from one state to another by heating or cooling.

### Heating

- If ice (solid) is heated, it changes to water (liquid). This change is called **melting**.
- Water (liquid) can change to water vapour (gas). This is called **evaporation**.
- If water (liquid) is heated until it **boils**, it changes to water vapour (gas) very quickly. Water boils at 100°C

### Task One

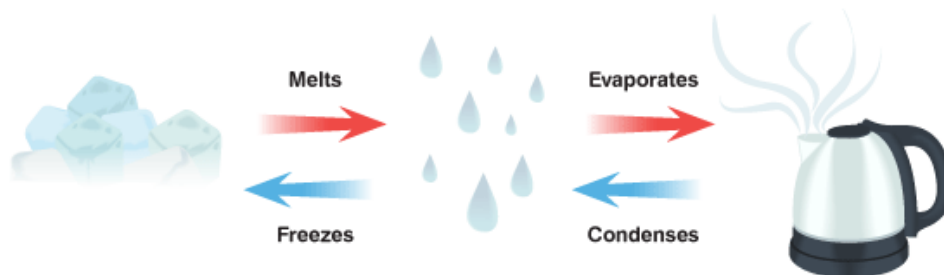
Investigation – If you can, get an ice cube and place it in a cup. Draw a picture of the cup with the ice in, into your Home Learning books.

Leave it in a warm spot in your house and after 10 minutes, look in the cup. The ice should have melted into water.

Draw what the cup looks like now and write a sentence explaining what has happened.

### Cooling

- If water vapour (gas) is cooled, it changes to water (liquid). This change is called **condensing**.
- If water (liquid) is cooled, it changes to ice (solid). This change is called **freezing**. Water freezes at 0°C.



BBC Video – Melting and Freezing - <https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z9ck9qt>

BBC Video – Freezing points and melting points - <https://www.bbc.co.uk/bitesize/clips/zrmqxnbn>

### Solids and liquids

Heat melts a solid and turns it into a liquid. Cooling freezes a liquid into a solid.

Different solids melt at different temperatures, some high, some low. These are called their melting points.

### Melting points

Different solids melt at different temperatures. Ice melts at 0 degrees Celsius (0°C). Chocolate and butter melt at about 35°C. We say that chocolate and butter have a higher **melting point** than ice.

It is useful to melt chocolate to pour it into mould to make special shapes such as Easter eggs. Melted chocolate can also be poured to decorate a cake or mixed with cereal to make treats to eat. You need to melt butter to mix it with other ingredients when baking. Butter melts when you spread it on toast that is hotter than 35°C. Chocolate and butter also melt in your mouth because you are about 37°C! This makes them easy to taste because they spread on your tongue.



If you can, ask your adult for a cube of chocolate. Put it on your tongue and wait for it to melt!



Wax has an even higher melting point: about 62°C. This makes it an ideal fuel to help create light as a candle. When you light the wick on a candle, the heat melts the wax in the wick and at the top of the candle. This liquid wax is drawn up the wick by capillary action, getting hotter and hotter until it turns into a gas. This gas mixes with oxygen in the air and is ignited by the flame keeping the candle alight. It is useful to melt wax to pour it into moulds to make different shapes and sizes of candles. Coloured wax can also be melted to make wax crayons.

Sugar has a very high melting point. It turns into a liquid at around 185°C and can be used to make sweets like toffee or caramel.



Metals, like aluminium and iron, also melt when we heat them. They have very high melting points. Melted metals can be poured into moulds to make sculptures or building materials like fence posts. A blacksmith heats metal until it begins to soften into a liquid. This makes the metal easy to bend, twist or hammer into all sorts of shapes including horseshoes, weapons, armour and tools. Jewellers heat precious metals to make different shaped jewellery. The table below shows some melting points of common metals.



Material	Melting point
Gold	1064°C
Silver	962°C
Iron	1525°C
Aluminium	660°C

### Task Two

Draw and complete the table below into your Home Learning books. Use the information above to help you.

**Mild – Complete 3 boxes, Spicy – Complete 4 boxes, Hot – Complete all the boxes.**

Material	Melting Point (temperature)	Why might it be useful to change the state of this material?
Ice		
Sugar		
Butter		
Wax		
Gold		
Iron		
Chocolate		

### Extension – Investigation

With the help of an adult, you can investigate different items to see which one melts the quickest. All you need is a hot water (ask an adult to help you with this), container, stopwatch, foil cups and items that melt e.g. butter, chocolate (plain, white and milk), ice etc.

Ask an adult to carefully pour the boiling water into the container. Place the items into the foil cups and put them in the water (they should float). Then, start the timer!

Watch the items carefully and then record the times into your Home Learning books once the items have melted.

Finally, write a conclusion stating which items melted and which ones didn't.

**Challenge** – Could you give a reason for why some of the items melted quicker than the others?

### Image of investigation



## Task Two Answers

Material	Melting Point (temperature)	Why might it be useful to change the state of this material?
Ice	1 °C	To drink or to mould into ice sculptures
Sugar	185°C	Used to make sweets such as caramel.
Butter	35°C	To spread on toast or to make cakes.
Wax	62°C	To make wax crayons and to use as fuel to create light.
Gold	1064°C	To make jewellery
Iron	1525°C	To make weapons, tools and horseshoes.
Chocolate	35°C	To make Easter Eggs.