

**SCIENCE: 29.06.20**

**Matter**

**LO: to understand and explain that materials can change state when heated or cooled.**

**Recap: Solids, Liquids and Gases**

BBC BITESIZE <https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs>

Look at the diagrams below. Write in each box whether the labelled part is a gas, a liquid or a solid.

The first diagram shows a kettle on a stove with steam rising from it. Labels include 'steam' pointing to the rising vapor, and 'kettle' and 'water' pointing to the kettle and its contents respectively.

The second diagram shows a hot air balloon with rain falling around it. Labels include 'rain' pointing to the falling water, 'basket' pointing to the balloon's basket, and 'hot air' pointing to the air inside the balloon.

The third diagram shows a glass of lemonade with a straw and a lemon slice. Labels include 'bubbles' pointing to the gas in the liquid, 'lemonade' pointing to the liquid, and 'glass' pointing to the solid container.

## Definitions

- Decide whether each statement describes a solid, liquid or gas.
- Put a tick in the right box if it does.

(HINT: Some statements may describe more than one, or none of them!)

	Solid	Liquid	Gas
<b>Can change its shape.</b>			
<b>Spreads out to fill all the space it can.</b>			
<b>Can be poured.</b>			
<b>Has a fixed shape.</b>			
<b>Takes the shape of the bottom of the container it is in.</b>			
<b>Can be squashed easily.</b>			
<b>Only changes shape if pushed or pulled.</b>			
<b>Cannot be squashed easily.</b>			
<b>Has no fixed shape.</b>			

I can work out whether something is a solid, liquid or gas based on descriptions of it.



## CHANGING STATE

### Cooling and melting

Some solids and liquids can be changed from one state to another by heating or cooling.

Have a think ..... Can you list three examples of solids turning into liquids when heated?

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Have another think ..... Can you list three examples of liquids turning into solids when cooled?

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Did you think of ice and water? Yes / No

With this example - heat melts a solid and turns it into a liquid. Cooling freezes a liquid into a solid.

**Q: Do you know the temperature at which the change of state takes place?**

A: Ice melts at 0 (zero) degrees Celcius.

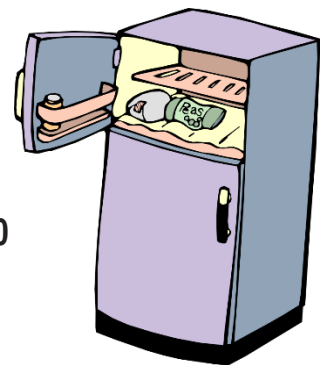
**Q: Do you think a freezer has a higher or lower temperature than 0 degrees Celcius?**

higher	lower
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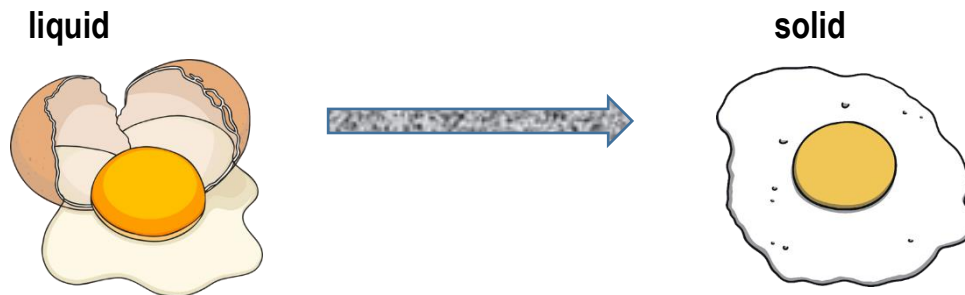
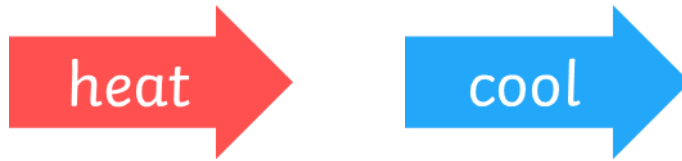
Explain how you know.

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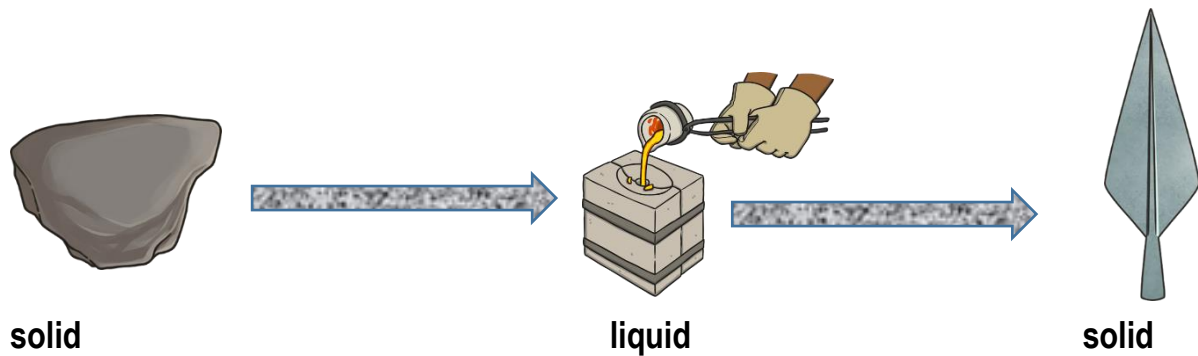
**Can you draw a diagram to show how water and ice are changed by heating and cooling?**



Here are some more examples of materials that change state.



In this example, the liquid is changed into a solid by **heat**.



In this example, the solid is changed into a liquid by **heating** and then reshaped by **cooling** to form a solid again.

Draw a flow diagram of another material that can change state by **heating** or **cooling**.

A large empty rectangular box with a black border, intended for the student to draw a flow diagram of a material that changes state by heating or cooling.

## Changing State: Chocolate experiment

### The Experiment



1. Place a piece of chocolate in your hand.
2. Count to 100 (keep your hand closed) or you can say the alphabet 5 times (keep your hand closed).
3. When you have finished counting to 100 or saying the alphabet 5 times open your hand.

What has happened to the chocolate?

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Why do you think this happened?

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

Is your body temperature higher or lower than 35 degrees Celcius? Explain how you know?

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Write the scientific word to complete the sentences:

is the process of **changing** a solid into a liquid.

is the process of **changing** a liquid into a solid.

This BBC Bitesize page summarises what you need to know about cooling and melting:

<https://www.bbc.co.uk/bitesize/topics/zkqg87h/articles/z9ck9qt>

If you can – watch the video clip showing school children, working with Professor Brian Cox, investigating if different types of chocolate have different melting points:

<https://www.youtube.com/watch?v=Cx5nTBmTpEc> We can compare results once school returns to normal.