Y4 – States of matter – Can materials change state?

Lesson 3

Lesson	3 of 5

Learning objective

I can observe what happens when liquids freeze.

National Curriculum links

NC Y4:

Children will:

- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)

Working scientifically:

- record findings using simple scientific language, drawings, keys, bar charts and tables

Key lesson question	What happens when liquids freeze?

Resources

- lesson presentation (ppt)
- practical activity ideas
- activity worksheet
- focus assessment sheet
- activity resources (see worksheet)

Teaching input

- **Scientific enquiry types and skills** – Review the 'scientific enquiry types' and 'working scientifically skills' the children will use in this lesson, highlighted on the slide.
- **Can materials change state?** – The slide shows the lesson questions the children will answer in this unit. The current lesson's question is highlighted on the slide.
- **Key vocabulary for this lesson** – Go through the key vocabulary for this lesson and their definitions. Have any of the children heard these words before? Did they already know their meanings?
- **Observing** – Introduce Jordan. Choose a child to read what Jordan says about the scientific enquiry type, 'Observing'. Jordan explains his role as a food scientist and how he observes foods as they melt and freeze, measuring their temperatures to get the perfect dessert!
- **Let's discuss** – The children are to discuss the question on the slide with their learning partners, in groups or as a class. Use children's responses to surface misconceptions. There are sentence starters on the slide to help them. Take feedback from the class before the answers are revealed on the following slide.
- **Freezing** – Read through the information on the slide. Highlight that cooling can change liquids into solids. This process is called 'freezing'.
- **Freezing point** – Read through the information on the slide. Introduce the idea of a freezing point and share examples: water, coconut oil, olive oil. Use this to build an understanding of why different materials freeze at different temperatures. Go through the keyword and its definition in the 'New word alert!' box.
- **Melting point** – Read through the information on the slide. This slide makes the link between freezing and melting temperatures for liquids and solids. The children are to discuss the question on the slide with their learning partners, in groups or as a class. Take feedback from the class before the answers are revealed on the following slide. Go through the keyword and its definition in the 'New word alert!' box.
- **Word detective** – Read through the information on the slide.
- **Observing** – Read through the information on the slide.
- **Setting up tests** – Read through the information on the slide.
- **Instructions** – Read through the information on the slide.
- **Let's recap** – Read through the information on the slide.
- **Activity** – The children are to follow the instructions and record the temperature and their observations on their activity worksheets. On the following slide, they are to discuss the questions with their learning partners, in groups or as a class, and write what they have found out on their activity worksheets. Children should recognise that some of their materials, whilst solid at room temperature, become liquids under warmer conditions. They should recognise that some liquids need to be cooled to much lower temperatures to become solid.
- **Challenge** – The children are to discuss the questions on the slide with their learning partners, in groups or as a class. Take feedback from the class before the answers are revealed on the following slide.

Main activity

Children set up the test following the instructions to observe the change of state: freezing from liquid to solid and melting from solid to liquid. They record the temperature at different locations and observe the state of each material at that temperature after 5 minutes.

Challenge

Children discuss the always, sometimes, never scenario with their partner before sharing ideas.

Cumulative quiz questions

7. What do we call the change when a liquid turns into a solid?
a) Melting b) Freezing c) Evaporating d) Boiling (Correct answer: b – Freezing)
8. Which of these changes is a reversible change?
a) Water freezing into ice b) Bread toasting c) Paper burning d) Egg cooking (Correct answer: a – Water freezing into ice)
9. True or false: When orange juice freezes and melts again, it is still orange juice. (Correct answer: True)

Self-assessment

- I can describe the change of state when a liquid is cooled.
- I can record observations of materials as they freeze and melt.
- I can explain that freezing and melting are reversible changes.

Key vocabulary

freeze – when a liquid turns into a solid state by cooling
reverse – to go back to how it was before
observe – to watch carefully and notice what happens