

**Objectives**

- To know the temperature in degrees Celsius (°C) at which ice melts.
- To make accurate measurements of temperature in degrees Celsius (°C) using data loggers.

**Resources**

Data loggers; containers of ice for each group and for demonstration; photocopiable page 172 'Polar ice' enlarged to A3 per group (optional); writing materials

**Speaking scientifically**

continuous measurement, data logger, melting point, probe, snapshot measurement, temperature

## Lesson 1: Melting ice

### Introduction

Show the class the beaker of ice. Ask: *What do you think will happen to this if we leave it in the classroom?* (Melt; change from a solid to a liquid.) Set up the data logger to make continuous measurements of temperature and display this on the interactive whiteboard. Ask: *What temperature is the ice now?* Write 'What is the melting point of ice?', and explain this is the key question for the lesson.

### Paired work

1. Ask the children to predict what temperature the ice will be when it melts, and to suggest how they could answer the question.

### Whole-class work

2. Discuss the children's ideas.
3. Demonstrate how to use the data logger to take snapshot measurements of the air temperature.
4. Decide together on a reasonable time interval between each measurement and how measurements will be recorded. Depending on the equipment and whether groups are sharing data loggers, it may be appropriate to show how a bar chart can be formed as you go along, or you may want to do this later when different readings have been recorded.

### Group work

5. Ask the children to record the temperature of the ice at intervals as agreed.
6. Ask the groups to make sure that every child has a turn using the data logger. Circulate and check that every child is able to use the data logger.
7. While the children are waiting between measurements, ask them to discuss the questions on the photocopiable sheet and for one child to scribe the group's responses.

### Whole-class work

8. At points during the group work stop the class to draw attention to the current temperature and invite observations and comments.
9. Look at the line graph generated by the changing temperatures of the ice. Invite children to describe the line, prompting them with questions: *Is it the same all the way along? Where is it steepest? What temperature was the ice at 2.30?*
10. Ask: *What is the melting point of ice? How do you know?* Establish that it is 0°C, but because not every piece of ice in the container melts at the same time this is not easy to pinpoint.
11. Ask: *How warm do you think the ice/water would get if we left it for longer?*
12. Review the groups' responses to photocopiable page 172 'Polar ice'.

**Differentiation**

- It may be helpful to teach a group of children how to use the data loggers in advance of the lesson so that they can act as expert technicians and help the other children.

### Science in the wider world

Although the size of the polar ice cap varies with the seasons as parts of the sea thaw and freeze, scientists are concerned that the average size has decreased by about four per cent every decade since 1979, due to global warming.

### Review

Can each child use the data logger to make a snapshot measurement of temperature? Can they answer the question 'At what temperature does ice melt?' correctly as 0°C, and explain the evidence for this?