

# Lesson Plan

## Measuring and Recording Temperature

### In this lesson each student will learn:

1. The definition of temperature.
2. How to read a thermometer.
3. How to record and present data.
4. How to comment their findings.
5. How to calculate the mean temperature and how to note the max and min temperatures.
6. How to convert between Celsius and Fahrenheit.

### Temperature

Temperature is the degree of hotness or coldness of a substance or environment.

### How do we measure temperature?

We use an instrument called a **thermometer** to measure temperature.

### Experiment 1: Recording and measuring temperature

#### Materials needed:

For this experiment you will need

- A mercury thermometer
- A radiator
- An ice pack
- A notepad
- A pen
- Graph paper

#### Method:

##### Part 1: Using the thermometer

1. Note the reading on the thermometer.
2. Place the thermometer on the radiator.
3. Note the new reading on the thermometer.
4. Place the thermometer on the ice pack.

5. Note the new reading on the thermometer.
6. Can you see how the thermometer gives different readings depending on the temperature?

### **Part 2: Recording data**

1. Find a place outside to keep the thermometer.
2. At the same time everyday (for example 10.00 a.m.), record the temperature at this place.
3. Repeat this everyday for a month.
4. Record the data on the notepad.
5. Choose one month in winter and one in summer to show differences.
6. After a month of recording, draw a graph to represent the data.
7. Put the days along the horizontal axis and the temperatures along the vertical axis.
8. Join the dots.

### **Part 3: Analysing results**

1. Ask the following questions:
  - Has the temperature has changed over the month?
  - Are there any differences between winter and summer months?
  - What was the coldest reading (minimum temperature)?
  - What was the hottest reading (maximum temperature)?
2. Calculate the average (mean) temperature for the month by adding up the temperature recorded on each day and dividing by the total number of days in the month.

## **Celsius and Fahrenheit**

There are two different temperature scales commonly used to read temperature.

These are **Fahrenheit** and **Celsius**.

In Ireland we use the Celsius scale.

On the Celsius scale, the boiling point of water is 100°C and freezing point is 0°C.

Fahrenheit is commonly used in America.

On the Fahrenheit scale, the freezing point of water is 32°F and the boiling point is 212°F.

## **How do I convert readings from Celsius to Fahrenheit?**

To convert between the two, we use the following equations:

$$T_C = (T_F - 32) \div 1.8$$

$$T_F = (T_C \times 9/5) + 32$$

$T_C$  means temperature in Celsius

$T_F$  means temperature in Fahrenheit

### **Example:**

**Question:** Convert 24°C (a pleasantly warm day) to Fahrenheit

$$T_C = 24$$

So,

$$T_F = (24 \times 9/5) + 32$$

$$T_F = (216/5) + 32$$

$$T_F = 43.2 + 32$$

$$T_F = 75.2^\circ\text{F}$$

**Answer:** 24°C = 75.2°F