Resources

Lord Kelvin

Resource 1 – The Three Big Temperature Scales

Fahrenheit

The Fahrenheit scale was created in 1724 and is named after its creator, Gabriel Daniel Fahrenheit. In the early 1700s, Fahrenheit invented simple thermometers. He used his scale on these thermometers.

The lower fixed point that Fahrenheit used was the lowest temperature he could reach in his lab. A salt and water solution froze at this temperature. He called this temperature zero degrees (0°F).

For his upper fixed points, Fahrenheit decided to use two different things: his own body temperature and the boiling point of water. He recorded his body temperature as 96°F and the boiling point of water as 212°F.

He then added another lower fixed point of the freezing point of water, recorded at 32°F.

It may seem strange that he used numbers that are not rounded up to record these fixed points. However, it is thought that he was not using a decimal system, which is more common to us nowadays, and perhaps instead his measurements were based on fractions, which were more convenient at the time.

Some countries, including the US, still use Fahrenheit as their general scale for measuring temperature.

Celsius

Celsius is the system of measuring temperature that we use today. A Swedish astronomer Andres Celsius developed this temperature scale in 1742.

He used two fixed points: the freezing point of water and the boiling point of water. However, when Celsius created the scale, he had the boiling point fixed at 0°C and the freezing point set at 100°C!

Resources

Lord Kelvin

After he died, the decision was made to turn his scale the other way around, giving us the scale we use today with 0°C as the freezing point of water and 100°C as the boiling point of water.

Each Celsius degree is larger than a Fahrenheit degree.

Kelvin

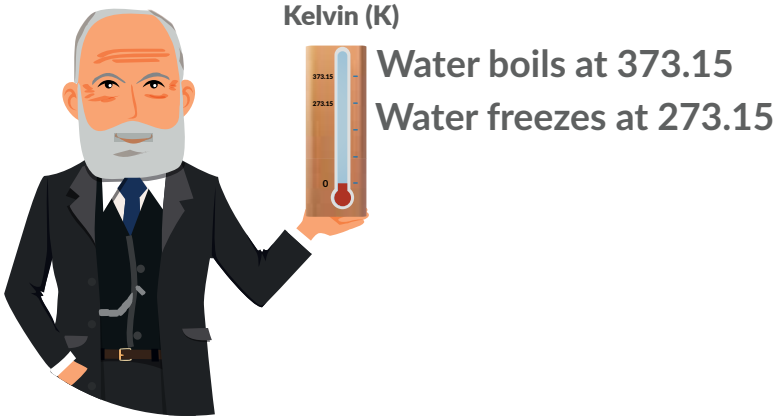
The Kelvin scale is named after Lord Kelvin, who was born in Belfast in 1824. Kelvin is an important scale used in most of science. The big difference between the Kelvin scale and Celsius or Fahrenheit is that it is based on just a single fixed point called absolute zero (0°C).

Absolute zero is a physically impossible-to-reach temperature at which scientists think that atoms would stop moving completely. Therefore, nothing can be colder than absolute zero on the Kelvin scale.

Although the idea of absolute zero was known before Kelvin, the scale is named after him because he was the one who was able to give its correct value as -459.67°F, which is -273.15°C.

From 0, the Kelvin scale increases by degrees that are the same size as Celsius degrees.

Water freezes at the value 273.15 Kelvin (K) and boils at 373.15 K.



Resources

Lord Kelvin

Resource 2 – Hotter or colder? Discuss and Decide

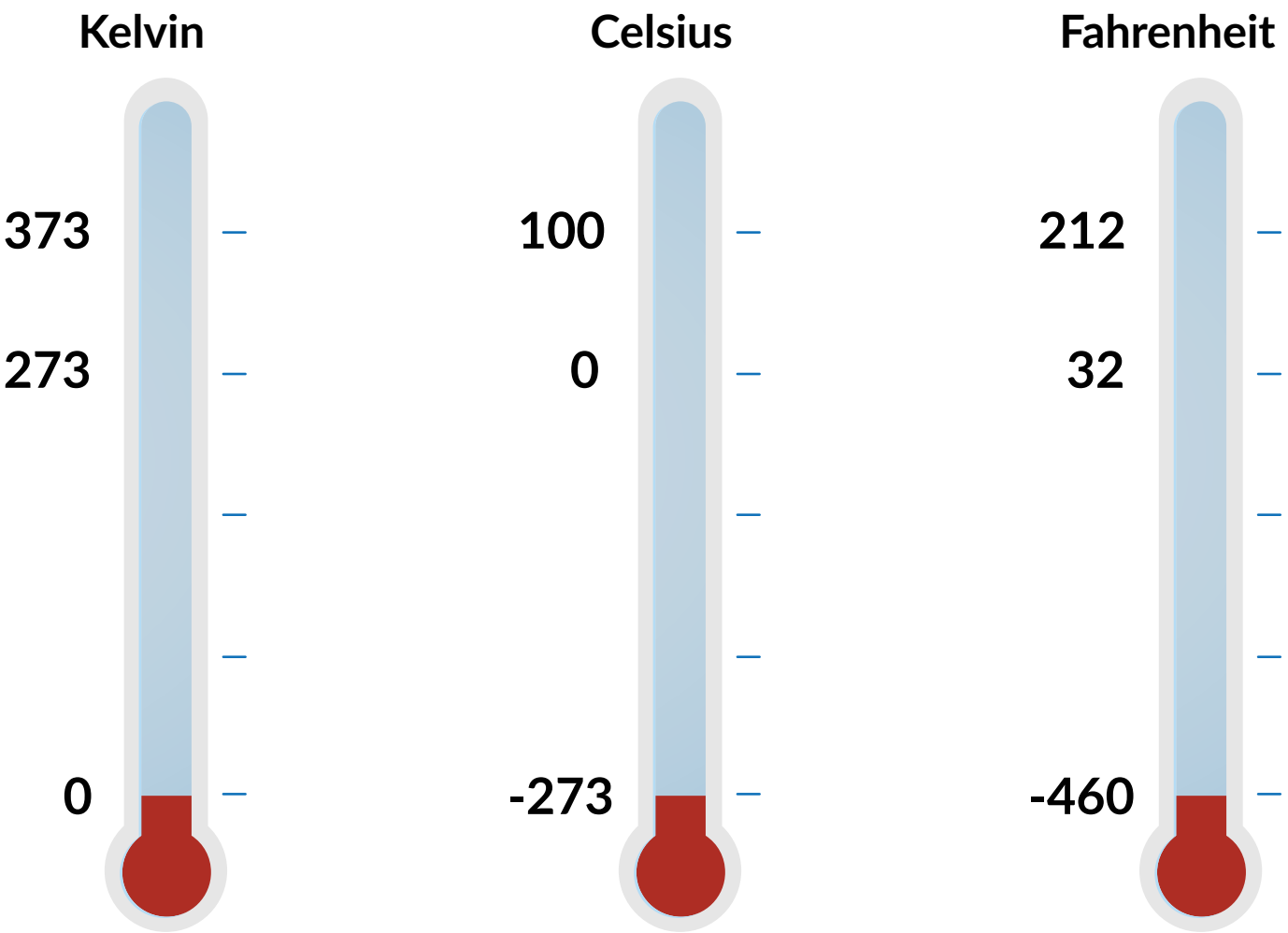
Cut out each of the statements below and use them to label the thermometers in Resource 3.

The temperature of the sun is 5778 K	The average Arctic winter temperature is -34°C	The average January temperature on the top of Mount Everest is -33°F	I am the boiling point of water.
Normal body temperature is 37°C	The average temperature in the Amazon rainforest is 299.8 K	I am absolute zero. Nothing can be colder than me.	A summer day on Mars may get up to 70°F
The moon at its coldest is 100 K or -173°C or -280°F	Chocolate melts best at 45°C	The air inside a hot air balloon is about 250°F	The temperature inside an igloo can be about 288 K

Resources

Lord Kelvin

Resource 3 – Hotter or colder? Equal to?



Resources
Lord Kelvin

Resource 4 – Answers (Teacher resource)

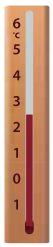
Note: all of the temperatures shown have been rounded so are shown without any decimals

	Fahrenheit	Celsius	Kelvin
Temperature of the sun	9941°F	5505°C	5778K
Air inside a hot air balloon	250°F	121°C	394K
Boiling point of water	212°F	100°C	373K
Chocolate melts	113°F	45°C	318K
Normal body temperature	98°F	37°C	310K
Average Amazon Rainforest temperature	80°F	27°C	300K
Summer day on Mars	70°F	21°C	294K
Temperature inside an igloo	59°F	15°C	288K
The average Arctic winter temperature	-29.2°F	-34°C	239K
Average January temperature at the top of Mount Everest	-33°F	-36°C	237K
The moon at its coldest	-280°F	-173°C	100K
Absolute Zero	-460°F	-273°C	0K

Resources

Lord Kelvin

Resource 5 – Thermometer Discuss and Decide Record Sheet

Type of Thermometer	Description	Accuracy and Sensitivity	When to use
bulb thermometer 			
temperature sensitive materials 			
digital thermometer 			
spring thermometer 			

Resources

Lord Kelvin

Resource 6 – Thermometer Discuss and Decide Cut and Stick

Description	Accuracy and Sensitivity	When to use
Includes a coiled piece of metal that is sensitive to temperature. One end of the spring is attached to a pointer. As the air gets warmer, the metal expands and moves the pointer higher. As it cools, the metal contracts and moves the pointer lower.	Most accurate and sensitive	To decide whether or not meat is cooked through
This has a sensor and can be used in a person's ear. It provides a quick reading which is very accurate.	Least accurate and sensitive	To make a mood ring
When a material can change colour due to a change in temperature, it is called 'thermochromism'. This new innovation helps engineers to solve lots of problems.	More accurate and sensitive than temperature sensitive materials	When you're not feeling well
Has a red or silver line that moves up or down through a glass or plastic tube as the temperature changes. It moves up as it gets hotter and down as it gets cooler.	Less accurate and sensitive than a bulb thermometer	To check that a baby's bath is between 36°C and 38°C