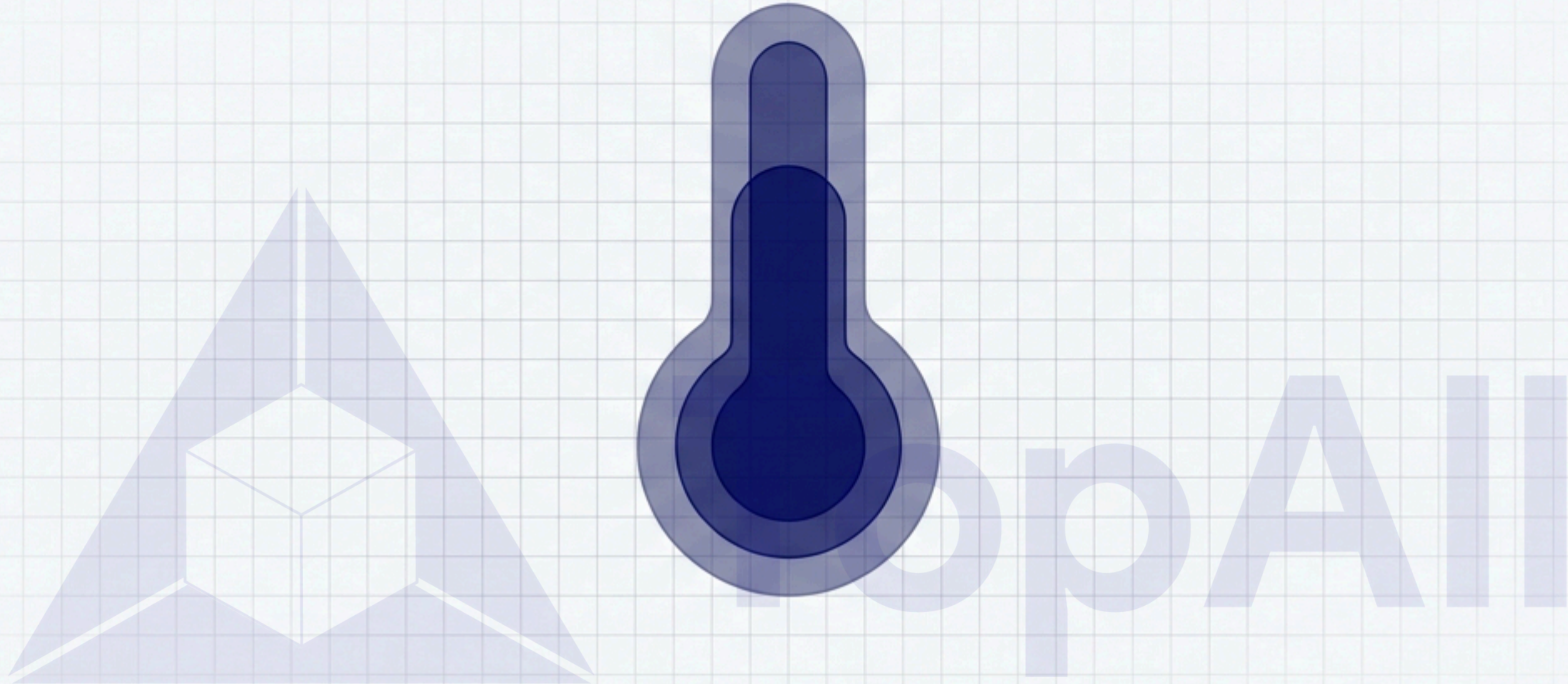




Celsius, Fahrenheit and Kelvin

Understanding the Three Common Temperature Scales

Measuring Heat

Temperature is primarily quantified using three distinct scales across everyday life and scientific research.

°C (Celsius)

The metric standard, based on the physical states of water.

°F (Fahrenheit)

The traditional scale, commonly used in the United States.

K (Kelvin)

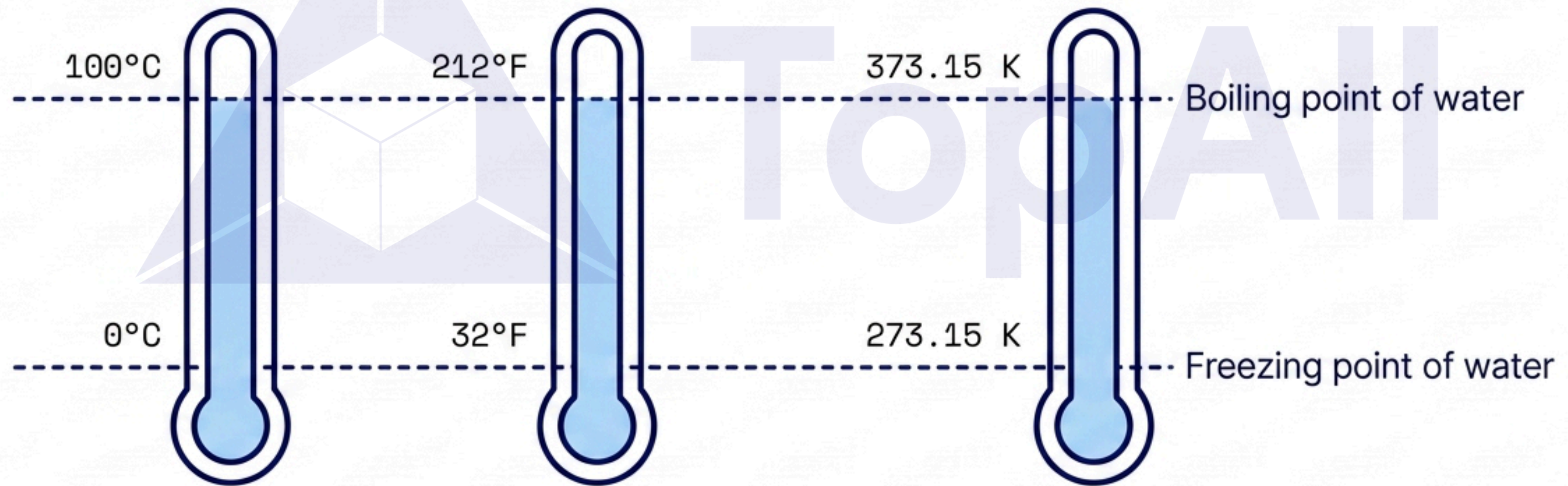
SI BASE UNIT

The primary unit of thermodynamic temperature in the International System of Units.

Strict Rule: No negative Kelvin temperatures.

Calibration and Equivalence

How the three scales align based on the physical properties of **water at standard pressure.**





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The Everyday Scales

Celsius ($^{\circ}\text{C}$)

- Freezing point: 0°C
- Boiling point: 100°C

Note: Negative values are possible and common in everyday weather reporting.

Fahrenheit ($^{\circ}\text{F}$)

- Freezing point: 32°F
- Boiling point: 212°F



A **100-degree** difference in Celsius equates to a **180-degree** difference in Fahrenheit.

The Absolute Scale

Kelvin (K) is the SI unit of thermodynamic temperature. It is defined by absolute zero, the theoretical point where particles have minimum kinetic energy.

KEY TAKEAWAY

Kelvin cannot have a negative temperature. The scale begins permanently at absolute zero.

ALERT

Syntax matters: Kelvin is written without a degree symbol (K, not °K).

Converting Between Scales

The mathematical relationships connecting the three temperature measurements.

Fahrenheit to Celsius

$$^{\circ}\text{F} = 9/5(^{\circ}\text{C}) + 32$$

Kelvin to Celsius

$$\text{K} = ^{\circ}\text{C} + 273.15$$

Summary Matrix

Quick reference guide for the three temperature scales.

Feature	Celsius	Fahrenheit	Kelvin
Symbol	°C	°F	K
SI Base Unit?	No	No	Yes SI BASE UNIT
Water Freezes	0°C	32°F	273.15 K
Water Boils	100°C	212°F	373.15 K
Negative Temps?	Yes	Yes	No



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