# Temperature

*Temp. is defined as the measure of heat or energy that a substance has.

  • The more energy a substance's molecules have — the <u>higher the temp</u>.

The thermometers that we use in the lab measure the temperature of substances using this principle.

cold substance   hot substance
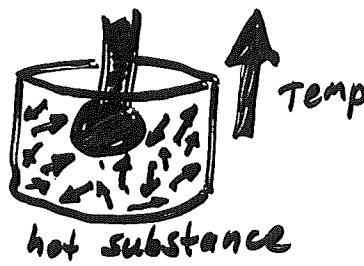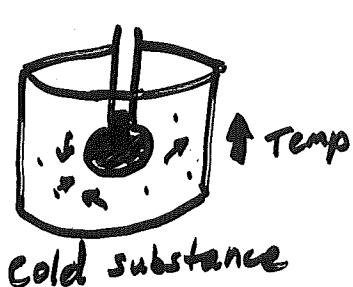
When measuring temp. there are 3 main Units that can be used. °F, °C & K (Kelvin).

  * Each temp. system has a strong pt. based on ease of use w/ freezing pt. or other phase change pts. of H_2O.

ex) °C has the <u>freezing pt</u>. of H_2O as <u>0°C</u>
     * easy to remember

     K has <u>absolute zero</u> as 0 K (coldest theoretical temperature)

     °F .... water freezes @ 32°F, boils @ 212°F
         absolute zero = -460°F

* Just like all measurements, temp. is used
in different units depending on situation or culture. ②

• If you are given a temp. in any system, you
can convert to any other system using formulas
below.

If given °C → $°F = \left(\frac{9}{5}°C\right) + 32$

→ $K = °C + 273.15$

If given °F → $°C = (°F - 32) \div \frac{9}{5}$

→ $K = \left[(°F - 32) \div \frac{9}{5}\right] + 273.15$

If given K → $°C = K - 273.15$

→ $\left[(K - 273.15) \times \frac{9}{5}\right] + 32 = °F$

ex) 29.5 °C → °F

ex) 1,250 K → °C

*New Scale - Rankine = $°F + 460$ Not used much, but
is the "zero" version of
°F

You need to appy the formulas to solve a 3×3 grid problem
Like the one below (give °F, °C, or K -solve for the rest)

°F	°C	K
		320 K
	82°C	
65°F		

* Solve horizontally

Another

°F	°C	K
123°F		
	180°C	
		412 K