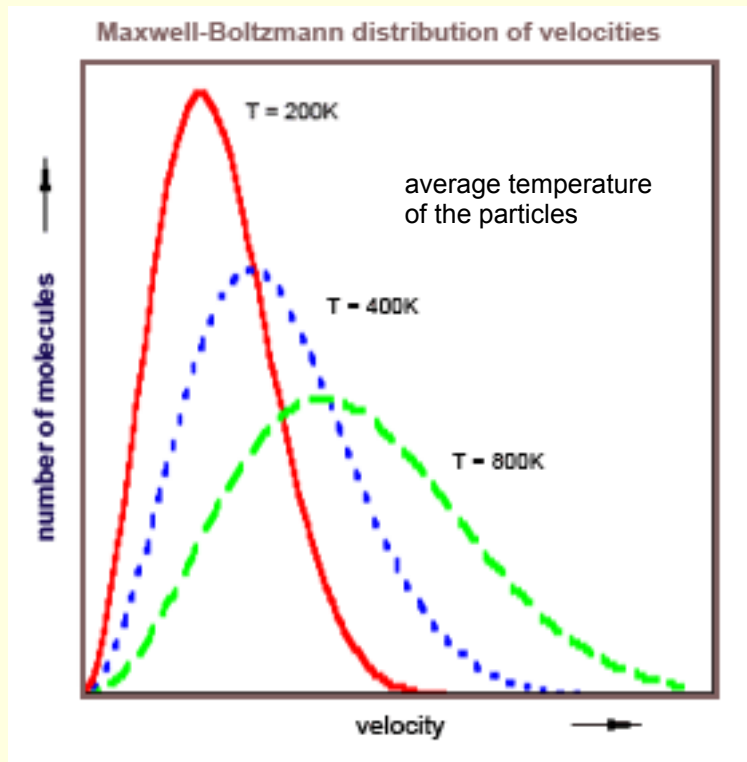


# Gas Unit

## Temperature

- is the measure of velocity of the particles



- change in kinetic energy(KE)

KE is dependent on speed of particles

$$KE = \frac{1}{2} mv^2 \quad m = \text{mass} \quad v = \text{velocity}$$

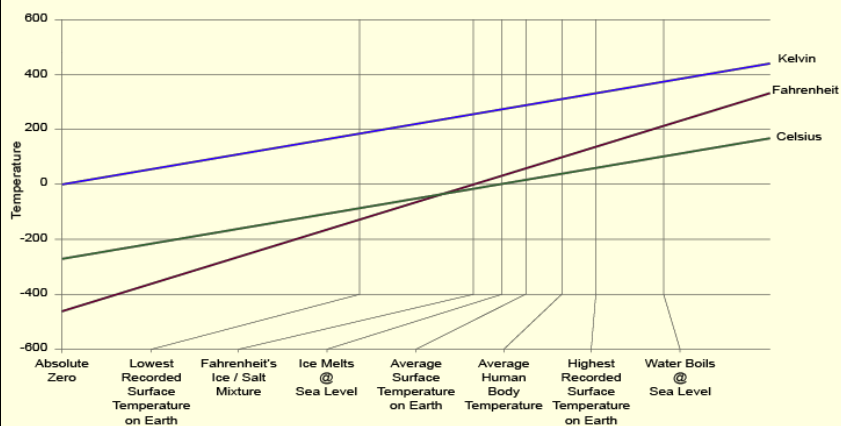
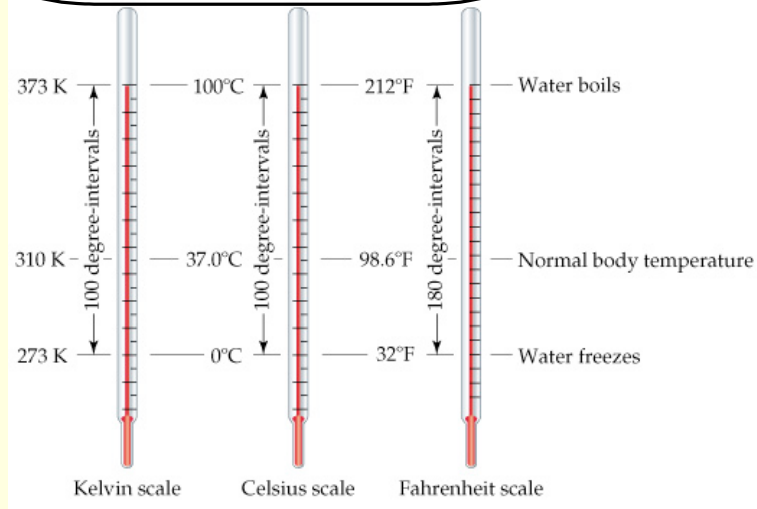
In any particular mixture of moving molecules, the speed will vary a great deal, from very slow particles (low energy) to very fast particles (high energy).

Most of the particles however will be moving at a speed very close to the average.

The Maxwell-Boltzmann distribution shows how the speeds (and hence the energies) of a mixture of moving particles varies at a particular temperature.

### Comparing Temperature Scales

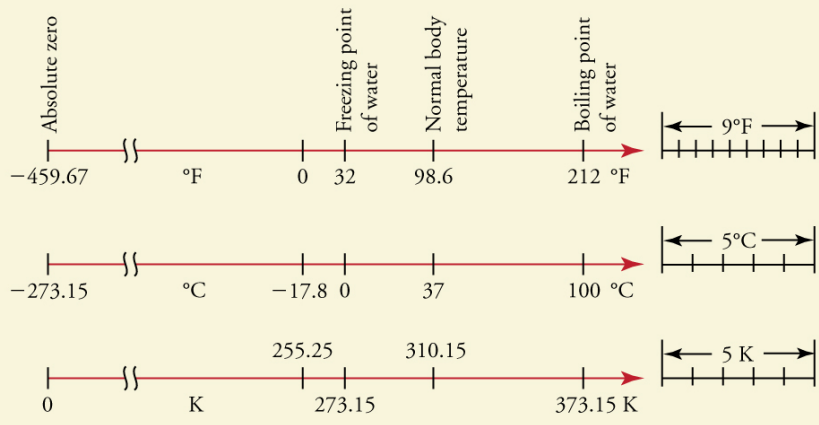
<sup>0</sup>Fahrenheit  
<sup>0</sup>Celcius (centigrade)  
 Kelvin



slope of K = slope of <sup>0</sup>C

273° difference

$$K = ^\circ C + 273.15$$



$$^\circ C = (^\circ F - 32) \times \frac{5}{9}$$

$$^\circ F = ^\circ C \times \frac{9}{5} + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$$

$$^{\circ}\text{F} = ^{\circ}\text{C} \times \frac{9}{5} + 32$$

1. Convert  $29^{\circ}\text{F}$  to  $\text{C}^{\circ}$

2. Convert  $87^{\circ}\text{C}$  to  $^{\circ}\text{F}$

3. Convert  $52^{\circ}\text{C}$  to K

4. Convert 760K to  $^{\circ}\text{C}$

What is temperature?

How do temperature compare in each of these?

solid

liquid

gas

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$$

$$^{\circ}\text{F} = ^{\circ}\text{C} \times \frac{9}{5} + 32$$

1. Convert 29<sup>o</sup>F to C<sup>o</sup>

$$^{\circ}\text{C} = (29^{\circ}\text{F} - 32) \times \frac{5}{9}$$

$$^{\circ}\text{C} = -1.67^{\circ}\text{C}$$

2. Convert 87<sup>o</sup>C to<sup>o</sup>F

$$^{\circ}\text{F} = 87^{\circ}\text{C} \times \frac{9}{5} + 32$$

$$= 188.6^{\circ}\text{F}$$

3. Convert 52<sup>o</sup>C to K

$$\text{K} = ^{\circ}\text{C} + 273$$

$$52^{\circ}\text{C} + 273 = 325 \text{ K}$$

4. Convert 760K to <sup>o</sup>C

$$760\text{K} = ^{\circ}\text{C} + 273$$

$$\begin{array}{r} -273 \\ 760\text{K} = ^{\circ}\text{C} + 273 \\ -273 \end{array}$$

$$^{\circ}\text{C} = 487\text{K}$$

## Attachments

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temperature-convert.webloc