Temperature

Temperature is the measurement of the kinetic energy (KE) of a substance.

- This is the movement of individual molecules and atoms.

\[ \text{Temp} \rightarrow \text{KE} \rightarrow \text{with an increase in temperature comes an increase in KE} \]

Temperature Scales

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>Freezing Point</th>
<th>( ^\circ C )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 212 )</td>
<td>( 32 )</td>
<td>100</td>
</tr>
<tr>
<td>( ^\circ F )</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>273.16</td>
</tr>
<tr>
<td>273.16</td>
<td></td>
<td>absolute zero</td>
</tr>
</tbody>
</table>

Belfast engineer/physicist

William Thompson, 1st Baron Kelvin
(1824 - 1907)

Kelvin is a measurement of the thermal energy of a system
- This is an absolute measurement

OK is absolute zero
- Current world record (1999) cooling Rhodium metal
  100 PK (picokelvins)
absolute hot
- at this point the rules of classical physics do not apply

Planck Temperature
$1.416785 \times 10^{32}$ K

Kelvin Conversion
$K = °C + 273.15$

Rankine Scale - Scottish engineer William Rankine (1859)
$1°R = 1°F$
$1°c = 1 K$