



6. Name three different uses of thermometers in technology.

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7. Which temperature scale is used for thermodynamic purposes?

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8. Complete the following table by converting the temperature from Celsius to Kelvin or vice versa:

Temperature in °C	Temperature in K
56	
	0
-136	
	158
254	
	367
0	
	221

### Summary

- Heat is energy that is transferred.
- Heat is measured in joule (J).
- The SI unit of temperature is kelvin (K).
- Temperature is the measure of the average kinetic energy of the particles a substance consists of.  $E_K = \frac{1}{2}mv^2$





## Summary

- Different thermometers:

	Alcohol thermometer	Mercury thermometer	Thermoelectric thermometer
Advantages	<ul style="list-style-type: none"> <li>Cheap</li> <li>Expands easily and moderately.</li> <li>Accurate readings</li> <li>It can measure very low temperatures up to <math>-115^{\circ}\text{C}</math>.</li> </ul>	<ul style="list-style-type: none"> <li>Mercury expands quickly and evenly.</li> <li>More accurate readings than the alcohol thermometer</li> <li>Mercury does not cling to the glass when the temperature drops.</li> </ul>	<ul style="list-style-type: none"> <li>Very accurate</li> <li>Does not absorb heat from the system</li> <li>Does not affect the system's temperature.</li> <li>Digital scale is easier to read.</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>Alcohol is colourless without colourant.</li> <li>Alcohol evaporates easily which could cause inaccuracy.</li> <li>Cannot measure high temperatures.</li> <li>Alcohol tends to cling to glass which means a correct reading cannot be taken immediately after a drop in temperature.</li> <li>Absorbs some of the system's heat and affects the accuracy of readings.</li> </ul>	<ul style="list-style-type: none"> <li>Low temperatures cannot be measured, because the freezing point of mercury is <math>-40^{\circ}\text{C}</math>.</li> <li>Poisonous</li> <li>Although the mercury is visible, it is sometimes difficult to see.</li> <li>Absorbs the heat of the system and therefore affects the accuracy of readings.</li> </ul>	<ul style="list-style-type: none"> <li>Can be expensive.</li> </ul>

- Uses of thermometers:
  - To measure temperature, e.g. atmosphere, earth.
  - To measure temperatures of ovens.
  - Determine whether the defrosting of aeroplane wings is required.
  - Determine whether salt is necessary on the roads for snow.
- Temperature scales
  - Celsius scale  
Commonly used to measure temperatures for everyday use, e.g. oven temperature.  
Measured in degrees celsius ( $^{\circ}\text{C}$ ).
  - Kelvin scale  
Commonly used in thermodynamics.  
SI unit for temperature - kelvin (K)
- $T = t + 273$   
 $t = T - 273$  where  $T$  = temperature in Kelvin  
 and  $t$  = temperature in degrees Celsius