



Exercise 26: Page 302

1. Heat is energy that is transferred.
2. Temperature is the measure of the average kinetic energy of the particles of a substance.
- 3.1 Joule (J)
- 3.2 Degrees Celsius ($^{\circ}\text{C}$) or Kelvin (K) or degrees Fahrenheit ($^{\circ}\text{F}$). K is the SI unit
4. Alcohol thermometer, mercury thermometer and the thermoelectric thermometer
- 5.

Type of thermometer	Benefits	Disadvantages
Alcohol	<ul style="list-style-type: none"> • Cheap • Large expansion, therefore quite accurate • Can measure very low temperatures. 	<ul style="list-style-type: none"> • Must be coloured for visibility. • Alcohol can evaporate. • Cannot measure high temperatures. • Alcohol clings to the glass and is therefore less accurate • Absorbs heat from the system, which makes it inaccurate.
Mercury	<ul style="list-style-type: none"> • Faster than the alcohol thermometer • Mercury does not cling to the glass and it is therefore more accurate. • No colourants necessary. 	<ul style="list-style-type: none"> • Mercury is poisonous. • Cannot measure very low temperatures. • Difficult to see the mercury in the tube. • Absorbs heat from the system, which makes it inaccurate.
Thermoelectric	<ul style="list-style-type: none"> • Very fast • Very accurate • Can measure very high as well as very low temperatures. • Does not absorb the system's heat. 	<ul style="list-style-type: none"> • More expensive

6.
 - To measure temperature, e.g. atmosphere.
 - To measure temperature, e.g. ovens
 - Determine whether the defrosting of aeroplane wings is required by monitoring the temperature of the wings.
 - The temperature of roads in countries where it snows a lot will determine whether salt is necessary on the roads or not.
 - Maximum-minimum thermometers are used to measure the temperatures for different weather conditions.





- Clinical thermometers are used to determine whether a patient has a fever or not.
- A pyrometer is a non-contact thermometer which is used, amongst others, to measure very high temperatures, for instance when metals are melted or to measure the temperature of lava in a volcano.

7. Kelvin

8.

Temperature in °C	Temperature in K
56	329
-273	0
-136	137
-115	158
254	527
94	367
0	273
-52	221