

**Mark scheme for Support Worksheet – Topic 3,
Worksheet 1**

- 1 $T(\text{K}) = T(\text{Celsius}) + 273 = -120 + 273 = 150 \text{ K}$ [1]
- 2 $T(\text{K}) = T(\text{Celsius}) + 273 \Rightarrow T(\text{Celsius}) = T(\text{K}) - 273 = 300 - 273 = 27^\circ \text{C}$ [1]
- 3 Changes in degrees Celsius and kelvin are the same so the change here is 30 K [1]
- 4 The sum of the total random kinetic energy and the total intermolecular potential energy of the molecules. [2]
- 5 In an ideal gas there are no intermolecular forces and hence no intermolecular potential energy. Hence internal energy consists of just the random kinetic energy of the molecules. [1]
- 6 $Q = C\Delta\theta \Rightarrow C = \frac{Q}{\Delta\theta} = \frac{500}{20} = 25 \text{ JK}^{-1}$ [1]
- 7 $Q = mc\Delta\theta \Rightarrow P = mc \frac{\Delta\theta}{\Delta t}$; This means that $c = \frac{Pt}{m\theta}$ [2]
- 8 The energy per unit mass that must be provided to a solid at its melting temperature so that it melts into a liquid at constant temperature. [2]
- 9 $L = \frac{Q}{m}$; so that $L = \frac{3800}{0.024} = 1.6 \times 10^5 \text{ J kg}^{-1}$ [2]
- 10 Evaporation takes place at all temperatures, boiling only at the boiling point; Evaporation takes place on the surface of a liquid, boiling takes place everywhere in the liquid volume. [2]