

3(a)	(thermal) energy per unit mass (to cause temperature change)
	(thermal) energy per unit change in temperature
3(b)(i)	density = mass / volume
	$\text{mass} = 2.700 \times 10^3 \times 3.612 \times 10^{-3}$ $= 9.752 \text{ kg}$
3(b)(ii)	$\text{volume} = 3.612 \times 10^{-3} \times (2.700 / 2.620) = 3.722 \times 10^{-3} \text{ m}^3$ or $\text{volume} = 9.752 / (2.620 \times 10^3) = 3.722 \times 10^{-3} \text{ m}^3$
3(b)(iii)	$W = p\Delta V$ $= 1.01 \times 10^5 \times (3.722 - 3.612) \times 10^{-3}$ $= 11.1 \text{ J}$
3(b)(iv)	volume (of block) increases
	work is done against the atmosphere so work done (on block) is negative
3(b)(v)	thermal energy = $(4.38 \times 10^6) + 11.1$
	specific heat capacity = $(4.38 \times 10^6) / (9.75 \times 500)$
	$= 898 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$
3(c)	work done is negligible compared with (change in) internal energy so (answer in (b)(v) would be) unchanged