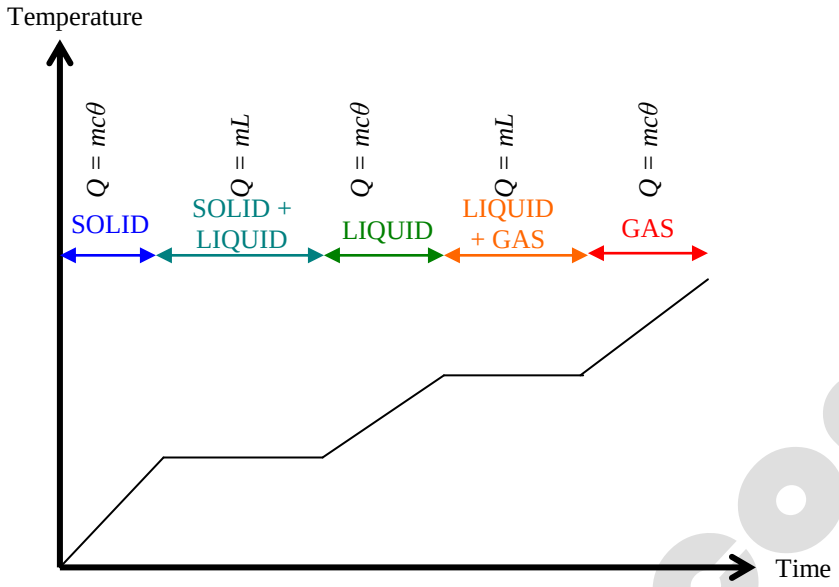
4.3.2 Specific Heat Capacity and Specific Latent Heat



Heating graph of a material from solid to gas

When calculating the amount of heat needed to change the state *and* temperature of an object, remember to take into account the different stages of heating as shown in the graph above.

Example:
To calculate the amount of heat needed to heat ice at 0 °C to water at 25 °C:

Amount of heat needed = $\underbrace{mL}_{\text{Heat needed to change ice at 0 °C to water at 0 °C}} + \underbrace{mc\theta}_{\text{Heat needed to change water at 0 °C to water at 25 °C}}$

When calculating the exchange of heat, remember to take into account the different stages of heating for *each side of the equation.*

Example:
Ice 0 °C is added to hot water 90 °C. To calculate the final temperature, x °C:

Amount of heat absorbed by ice = Amount of heat released by hot water

$\underbrace{mL}_{\text{Heat needed to change ice at 0 °C to water at 0 °C}} + \underbrace{mc\theta}_{\text{Heat needed to change water at 0 °C to water at } x \text{ °C}} = \underbrace{mc\theta}_{\text{Heat needed to change hot water at 90 °C to water at } x \text{ °C}}$

ASSUMPTION: No heat lost to surrounding.