


Specific Heat

- An energy exchange that is *not* describable by work is **heat**, Q
- Adding this heat to an object changes its temperature $Q = mc\Delta T$
 Specific heat
- Objects in a system can exchange heat (+ is gaining energy, - losing)

Heat Problems

- Objects can exchange heat by contact
- They will eventually reach temperature equilibrium
- If isolated system, objects exchange heat with each other, net exchange is zero
($Q_1 + Q_2 + \dots = 0$)

Latent Heat

- At certain temperatures (depending on material), adding or removing heat doesn't change the temperature
- Instead, the phase (type of behavior of the substance) changes
- Amount of heat required to fully change phase depends on mass and **latent heat** of material

$$Q = m L$$

Types of Latent Heat

- Solid \leftrightarrow liquid: **latent heat of fusion**
- Liquid \leftrightarrow gas: **latent heat of vaporization**
- Solid \leftrightarrow gas: **latent heat of sublimation** (rare)
- Sign of Q depends on direction: “hotter” phases require pos. Q , “cooler” neg. Q
- For all three, energy required to change phase usually large compared to energy required to change temp 1 K

Example: Boiling Water