

First, review:

- 1) What is a system? _____
- 2) What are surroundings? _____
- 3) How does heat/energy flow in an exothermic change? _____
- 4) How does heat/energy flow in an endothermic change? _____
- 5) Give an example of an exothermic change: _____
- 6) Give an example of an endothermic change: _____

Second, some energy change problems using dimensional analysis:

- 7) Convert 45 kJ to J [45 000 J]

$$\text{_____} \left(\frac{\text{_____}}{\text{_____}} \right)$$

- 8) Convert 301 Cal to cal [301 000 cal]

$$\text{_____} \left(\frac{\text{_____}}{\text{_____}} \right)$$

- 9) Convert 1002 calories to J [4192 J]

$$\text{_____} \left(\frac{\text{_____}}{\text{_____}} \right)$$

- 10) Convert 2.3 kJ to Cal [0.55 Cal]

$$\text{_____} \left(\frac{\text{_____}}{\text{_____}} \right)$$

- 11) Convert 2500 J to kJ [2.5 kJ]

$$\text{_____} \left(\frac{\text{_____}}{\text{_____}} \right)$$

- 12) Convert 76 cal to kcal [0.076 kcal]

$$\text{_____} \left(\frac{\text{_____}}{\text{_____}} \right)$$

Third, some specific heat capacity questions:

- 13) What is specific heat capacity? _____

- 14) What are the units of specific heat? _____
- 15) What is the symbol for specific heat? _____
- 16) Here is a chart of specific heat capacities:

Material	Specific Heat Capacity (J/g·°C)	Material	Specific Heat Capacity (J/g·°C)
aluminum (Al)	0.9025	iron (Fe)	0.4494
concrete	0.84	lead (Pb)	0.1276
ethyl alcohol (CH ₃ CH ₂ OH)	2.4194	mercury (Hg)	0.13950
gold (Au)	0.12905	solid steel	0.4494
helium (He)	5.1931	titanium (Ti)	0.5526
hydrogen (H ₂)	14.304	water (H ₂ O)	4.184

- Which has the highest specific heat capacity? _____
- Which has the lowest specific heat capacity? _____
- How do the specific heat capacities of metals compare with those of liquids? _____

- 17) A 49.2 g sample of solid steel was heated from 24.1 °C to 67.3 °C. What was the energy change? (must show work for credit) [955 J]

q = _____

c = _____

m = _____

ΔT = _____

- 18) How much heat is required to raise the temperature of 7.89 g of ethyl alcohol from 25.0 °C to 72.7 °C? (must show work for credit) [911 J]

q = _____

c = _____

m = _____

ΔT = _____