

Textbook Page 291 #1, 2, 5, 8, 9

1.
 - (a) potential energy
 - (b) potential energy
 - (c) kinetic energy
 - (d) potential energy

2.
 - (a) endothermic (a liquid must absorb energy to evaporate)
 - (b) exothermic (combustion releases energy)
 - (c) exothermic (combustion releases energy)
 - (d) endothermic (a solid must absorb energy to melt)
 - (e) endothermic (energy must be absorbed to break a bond)
 - (f) endothermic (the surroundings lost energy – therefore, the system gained (absorbed) energy)

5. Fission and fusion are both nuclear reaction (produce new atoms) and involve very large energy changes. Fission involves the breaking down of nuclei into smaller nuclei whereas fusion involves the combining of nuclei producing larger nuclei.

8. The higher temperature (100°C) means that, on average, the water molecules in the cup have higher kinetic energy than the water molecules in the pool at 24°C. Thermal energy, however, is the total kinetic energy of the molecules, and there are far more water molecules in the pool.

9. Freezing of water is an exothermic process. Liquid water has more *potential energy* than solid water (ice). As the water freezes some of it's potential energy is converted to *kinetic energy* of the molecules and is lost as *thermal energy* to the *surroundings*. The freezing water is the *system* in this case.