# **Unit 3 –Energy & States of Matter - Part 2 Objectives**

| Question | Response |
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| 1. Relate observations regarding the addition of energy by warming to increased particle motion |  |
| 2. Describe the characteristics of solids, liquids and gases in terms of particles and their:* Arrangement: use particle diagrams to account for motion and density differences; describe the process of how the arrangement of matter particles changes during phase changes.
* Attractions: infer the necessity of an attractive force between particles at close range from observations of differences in cohesiveness of the three phases;
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| 3. Define energy; describe the ways in which it is stored in a system. |  |
| 4. Describe three ways in which energy is transferred between system and surroundings. |  |
| 5. Draw energy bar charts to account for energy storage and transfer in all sorts of changes. Make up a sample situation and sketch the bar chart. |  |
| 6. Given a heating/cooling curve for a substance, identify what phase(s) is/are present in the various portions of the curve, and what the melting and freezingtemperatures for the substance are. |  |
| 7. Given a heating/cooling curve for a substance, identify which energy storage mode is changing for the various portions of the curve. |  |
| 8. Given a situation in which a substance at a given temperature undergoes a change (in temperature, phase or both), sketch a heating/cooling curve that represents the situation. |  |
| 9. State the physical meaning of the heat of fusion (*Hf*) and heat of vaporization (*Hv*) for a given substance. Use these factors to relate the mass of a substance to the energy absorbed or released during a phase change (at the melting or freezing temperature). |  |
| 10. State the physical meaning of the heat capacity (*c*) of a substance and use this factor to relate the mass and temperature changes to the energy absorbed or released during a change in temperature (with no phase change). |  |