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| **Strand: MS – PS 1-4** |
| **Topic: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.** |
| **Grade: 6th Grade Science** |
| **Score 4.0** | **In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.** | **Sample Activities** |
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|  | **3.5** | In addition to score 3.0 performance, in-depth inferences and applications with partial success. |  |
| **Score 3.0** | **The student:*** Creates a phase change model using lab data.
* Infer the temperature at which phase changes occur from a graph.
* Compare the observable physical properties (shape and volume) of solids, liquids, and gases
* Describes the changes in properties (volume, appearance, density, etc) that occur with a phase change.
* Explain the relationship between phase changes and addition/subtraction of thermal energy

**The student exhibits no major errors or omissions.** | * Melt ice to boiling point.
* Measure volume differences of objects before and after heating/cooling.
* Draw atom/particle arrangement of the 3 phases of matter
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|  | **2.5** | No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content. |  |
| **Score 2.0** | **There are no major errors or omissions regarding the simpler details and processes as the student:*** The student can identify and define each phase change
* The student can identify and define each state of matter
* The student can find mass, volume, density and temperature of an object.

**However, the student exhibits major errors or omissions regarding the more complex ideas and processes.** |  |
|  | **1.5** | Partial knowledge of the 2.0 content, but major errors or omissions regarding the 3.0 content. |  |
| **Score 1.0** | **With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.** |
|  | **0.5** | With help, a partial understanding of the 2.0 content, but not the 3.0 content. |
| **Score 0.0** | **Even with help, no understanding or skill demonstrated.** |