

Look What You've Done I'm Melting!

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Grade Level 6th Grade

Course Chemistry, Physical Science

What is in a phenomenon-driven three-dimensional (3D) instructional set? These science resources use phenomena to facilitate engaging and meaningful learning, instruction, and formative assessment. Each resource set contains a guiding document and three other types of documents: an Instructional Task (IT), a corresponding formative Assessment Task (AT), and a corresponding Pattern Analysis of Student Thinking (PAST). These resources are not intended to be a complete lesson plan. Three-dimensional learning is not limited to one specific type of lesson format and is compatible with most lesson plan models. The IT proposes two or more possible phenomena that could be used to drive an instructional sequence addressing a specific OAS-S standard. It also provides suggestions for engaging students with the phenomena through meaningful learning experiences in three dimensions. The AT focuses on a phenomenon-associated scenario. It contains one or more tasks designed to give students opportunities to show their thinking and provide evidence-based explanations about the disciplinary core ideas (DCIs) using crosscutting concepts and scientific practices for that standard. The PAST document is directly associated with the AT. It describes the intended purpose of each part of the AT and includes relevant student response themes to help teachers identify patterns of student thinking. It also provides guidance and insight into how to interpret student responses and possible instructional moves for facilitating student understanding of a specific DCI concept. Individual teachers can use the PAST as a tool to construct a rubric for the AT.

Performance Expectation (PE)

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.

Disciplinary Core Ideas (DCI)

Structure and Properties of Matter

Gases and liquids are made of molecules or inert atoms that are moving about relative to one another. In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations.

The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter.

Definitions of Energy (secondary to MS-PS1-4)

The term "heat" as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and to the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects.

Resource Attachments

Phenomenon-Based Instructional Task

- Guide to Using a Phenomenon-Driven Three-Dimensional Instructional Set 3-6-19—Look What You've Done I'm Melting!.pdf
- MS-PS1-4 IT Energy and States of Matter Melting—Look What You've Done I'm Melting!.pdf

Formative Assessment Task

- MS-PS1-4 AT Energy and States of Matter Ice Fumaroles—Look What You've Done I'm Melting!.pdf

Pattern Analysis of Student Thinking (PAST)

- MS-PS1-4 PAST Energy and States of Matter Ice Fumaroles—Look What You've Done I'm Melting!.pdf