Standard #: SC.912.P.12.11

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Describe phase transitions in terms of kinetic molecular theory.

General Information

Subject Area: Science

Grade: 912

Body of Knowledge: Physical Science

Idea: Level 2: Basic Application of Skills & Concepts

Standard: Motion -
A. Motion can be measured and described qualitatively and quantitatively. Net forces create a change in motion. When objects travel at speeds comparable to the speed of light, Einstein's special theory of relativity applies.

B. Momentum is conserved under well-defined conditions. A change in momentum occurs when a net force is applied to an object over a time interval.

C. The Law of Universal Gravitation states that gravitational forces act on all objects irrespective of their size and position.

D. Gases consist of great numbers of molecules moving in all directions. The behavior of gases can be modeled by the kinetic molecular theory.

E. Chemical reaction rates change with conditions under which they occur. Chemical equilibrium is a dynamic state in which forward and reverse processes occur at the same rates.

Date Adopted or Revised: 02/08

Content Complexity Rating: Level 2: Basic Application of Skills & Concepts - More Information

Date of Last Rating: 05/08

Status: State Board Approved

Related Courses

Course Number	Course Title
2003340:	Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003350:	Chemistry 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002430:	Integrated Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002440:	Integrated Science 3 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002450:	Integrated Science 3 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003310:	Physical Science (Specifically in versions: 2015 - 2022 (current), 2022 and beyond)
2003320:	Physical Science Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003800:	Florida's Preinternational Baccalaureate Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
7920011:	Access Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
2002445:	Integrated Science 3 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
2003345:	Chemistry 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
7920022:	Access Physical Science (Specifically in versions: 2016 - 2018, 2018 and beyond (current))

Related Resources

Lesson Plans

Name	Description
Solids, Liquids and Gases, Oh My!:	• Students will investigate the three phases of water by measuring the temperature changes to ice as heat is applied and they record temperature changes. • Students will graph the data (y) temperature and (x) time and connect the points to show what happens to temperature as water changes phases. • Students will write a paragraph explaining how this process works.
BIOSCOPES Summer Institute 2013 - States of Matter:	This lesson is designed to be part of a sequence of lessons. It follows CPALMS Resource #52957 "BIOSCOPES Summer Institute 2013 - Thermal Energy" and precedes CPALMS Resource #52961 "BIOSCOPES Summer Institute 2013 - Solutions." The lesson employs a predict, observe, explain approach along with inquiry-based activities to enhance student understanding of states of matter and phase changes in terms of the kinetic molecular theory.

Heating Curve of Water:	The lesson is inquiry based, asking students to investigate phase changes and kinetic molecular theory. They are to measure and graph the heating of water while correctly analyzing how the particles kinetic energy changes through each phase change.
SMALL: Shape Memory Alloy Lab:	Shape Memory Alloys are metals that can return to or 'remember' their original shape. They are a cutting edge application for Chemistry, Physics, and Integrated Science. The activities in this lesson work well for the study of forces, Newton's Laws, and electricity in physics. They also lend themselves well to crystalline structures, heat of reaction, and bonding in chemistry. In addition, students could study applications for the materials in the medical and space industries.

Perspectives Video: Professional/Enthusiast

Name	Description
The Science of Chocolate: Crystals, Texture, and Phase Change:	Where have you bean? Didn't you know that chocolate is a delicious topic for discussing phase change? Download the CPALMS Perspectives video student note taking guide.

Teaching Idea

Name	Description
Melt Away - Exploring the Heat of Fusion of Water:	The heat of fusion of water is the energy required to melt one gram of ice. In this lab, your students will use experimental evidence to approximate the heat of fusion of water. They'll also compare the energy needed to cause a change of state to the energy needed to change temperature with no change of state. This lab can be used at the middle or high school level, depending on your learning objectives and how you introduce and debrief the activity.

Text Resource

Name	Description
Ultracold Atoms:	This informational text resource is intended to support reading in the content area. Most students are familiar with the four most common states of matter, but what about the 5th state of matter, the Bose-Einstein condensate (BEC for short)? This article explains what a BEC is and how researchers are exploring this unique state of matter.