

# Unit 14: Chapter 17: Thermochemistry

Content Area: **Science**  
Course(s): **Chemistry Honors, Chemistry AH**  
Time Period: **Semester 2**  
Length: **2 weeks**  
Status: **Published**

## Standards

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PS1-4

PS3-1

PS3-4

SCI.9-12.HS-PS1-4	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
SCI.9-12.HS-PS3-4	Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
SCI.9-12.HS-PS3-1	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.

## Goals/Objectives

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How are the changes that we see every day described and represented by chemists?

What is the role of energy in chemical changes?

## Content

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Changes in energy

Heat

Enthalpy / Entropy

Gibbs Free Energy

Calorimetry

Conservation of energy

## **Skills**

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Writing chemical equations

Classifying chemical reactions

Contrasting exothermic and endothermic reactions

Define and convert between energy units

Quantitatively perform calorimetry

Interpret energy graphs

Calculate the heat of reaction

## **Learning Activities/Instructional Strategies**

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- Activity: Chemistry of Handwarmers
- Chapter 17 Packet
- LAB: Calorimetry
- LAB: Heat Capacity
- LAB: Heat of Solution

## **Assessment of Learning**

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- Chapter test
- Discussion
- Homework
- Lab report

## **Differentiation**

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- Alternative Assessments
- Choice of activities
- Choice of books
- Flexible grouping
- Guided reading
- Homework options (describe)
- Independent research and projects
- Leveled rubrics

- Modified materials
- Multiple texts
- Multi-sensory
- Personal agendas
- Pre-teach
- Re-teach
- Stations/Centers

## **21st Century**

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### **21st Century Themes**

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- Business, Financial, Economic Literacy
- Civic Literacy
- Global Perspectives
- Health Literacy

### **21st Century Skills**

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- Communication and Collaboration
- Creativity and Innovation
- Critical Thinking and Problem Solving
- Information Literacy
- Life and Career Skills
- Media Literacy

### **Interdisciplinary Connections**

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- Computers
- Engineering
- Math
- Science

### **Integration of Technology**

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- Calculators
- Computer Lab/Laptops

- Digital Scales & Meters
- Graphing Calculators
- Internet Resources
- iPads
- SMART Board

TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.12.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.12.F	Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.12.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.12.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.12.D	Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.
TECH.8.2.12.E	Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.