

# ODYSSEY Molecular Explorer

— Release 7.0 —

Correlation with the

## Wyoming Science Content and Performance Standards

Grade Span 9-12

Adopted July 7, 2003

### 1. CONCEPTS AND PROCESSES

In the context of unifying concepts and processes, students develop an understanding of scientific content through inquiry. Science is a dynamic process; concepts and content are best learned through inquiry and investigation.

### EARTH, SPACE, AND PHYSICAL SYSTEMS:

#### 10. Structure and Properties of Matter:

Students describe the atomic structure of matter including subatomic particles, their properties, and interactions. They recognize that elements are organized into groups in the periodic table based on their outermost electrons and these groups have similar properties. They explain chemical bonding in terms of the transfer or sharing of electrons between atoms. Students describe physical states of matter and phase changes. Students differentiate between chemical and physical properties, and chemical and physical changes.

- **C6** *Chemical Matter* "States of Matter"
- **C7** *Chemical Matter* "Comparing States Side-by-Side"
- **C12** *Chemical Matter* "Types of Properties"
- **C13** *Chemical Matter* "Physical Changes"
- **D2** *Atoms* "Distribution of Mass in Atoms"
- **F1** *Chemical Bonding* "The Attraction Between Ions"
- **F7** *Chemical Bonding* "Electron Sharing"
- **F8** *Chemical Bonding* "Energetics of Covalent Bonding"
- **F11** *Chemical Bonding* "Polar Bonds and Molecules"
- **F13** *Chemical Bonding* "Classifying by Bond Polarity"
- **H20** *Liquids & Solids* "Melting Transition"
- **P1** *Main Groups & Transition Metals* "Alkali Metals"

- **P2** *Main Groups & Transition Metals* "Alkaline Earth Metals"
- **P3** *Main Groups & Transition Metals* "Boron Group"
- **P4** *Main Groups & Transition Metals* "Carbon Group"
- **P6** *Main Groups & Transition Metals* "Nitrogen Group"
- **P7** *Main Groups & Transition Metals* "Oxygen Group"
- **P10** *Main Groups & Transition Metals* "Halogens"
- **P11** *Main Groups & Transition Metals* "Noble Gases"
- **P12** *Main Groups & Transition Metals* "Elements of the d- and f-Blocks"

## 11. Chemical Reactions:

Students recognize that chemical reactions take place all around us. They realize that chemical reactions may release or consume energy, occur at different rates, and result in the formation of different substances. They identify the factors that affect reaction rates.

- **M1** *Kinetics* "Observing a Reaction"
- **M2** *Kinetics* "Reactive Collisions"
- **M3** *Kinetics* "Mechanism of a Reaction"

## 12. Conservation of Energy and Increase in Disorder:

Students demonstrate an understanding of the laws of conservation of mass and energy within the context of physical and chemical changes. They realize the tendency for systems to increase in disorder.

- **L4** *Thermochemistry* "Vibrating Diatomic Molecule"
- **M1** *Kinetics* "Observing a Reaction"
- **M3** *Kinetics* "Mechanism of a Reaction"
- **O1** *Chemical Thermodynamics* "Gas Expansions"
- **O3** *Chemical Thermodynamics* "Heat Conduction"

## 13. Energy and Matter:

Students demonstrate an understanding of types of energy, energy transfer and transformations, and the relationship between energy and matter.

- **L2** *Thermochemistry* "Thermal Energy"
- **L4** *Thermochemistry* "Vibrating Diatomic Molecule"
- **O3** *Chemical Thermodynamics* "Heat Conduction"