# Unit 13: Chapters 15 & 16: Water and Aqueous Systems and Solutions

Content Area: Science

Course(s): Chemistry Honors, Chemistry AH

Time Period: Generic Time Period

Length: **3 weeks** Status: **Published** 

#### **Standards**

PS1-3

PS1-5

SCI.9-12.HS-PS1-5 Apply scientific principles and evidence to provide an explanation about the effects of

changing the temperature or concentration of the reacting particles on the rate at which a

reaction occurs.

SCI.9-12.HS-PS1-3 Plan and conduct an investigation to gather evidence to compare the structure of

substances at the bulk scale to infer the strength of electrical forces between particles.

#### **Goals/Objectives**

Why is water so important and unique?

How do things dissolve and how does dissolving change the properties of the individual components?

#### **Content**

Solvation (hydration)

Dissociation

Interparticle forces

Polar v. nonpolar

Concentration: Molarity, molality

Solubility

Colligative Properties

#### **Skills**

Describe solvation

Describe how interparticle forces (namely hydrogen bonding) are the reason behind water's unique properties

Describe the factors that affect solubility

Describe and apply colligative properties

Qualitatively and quantitatively describe the concentration of a solution

Interpret solubility graphs

## **Learning Activities/Instructional Strategies**

- Chapter 15 Packet
- LAB: Factors Affecting Solution Formation
- LAB: Making a Solution
- LAB: Solvent Properties of Water
- LAB: Supersaturated Solution
- LAB: Surface Tension
- POGIL Molarity
- POGIL Solubility Curves

### **Assessment of Learning**

- Chapter test
- Discussion
- Homework
- Lab report

#### **Differentiation**

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

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

## 21st Century

## **21st Century Themes**

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

## **21st Century Skills**

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

## **Interdisciplinary Connections**

- Computers
- Engineering
- Math
- Science

## **Integration of Technology**

- Calculators
- Computer Lab/Laptops

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

TECH.8.1.12.A Technology Operations and Concepts: Students demonstrate a sound understanding of

technology concepts, systems and operations.

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.C Design: The design process is a systematic approach to solving problems.

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.