

2020 Unit 03: Reactions

Content Area: **Science**
Course(s): **Advanced Placement Chemistry**
Time Period: **November**
Length: **1 Month**
Status: **Published**

Unit Overview:

This unit focuses on different types of reactions and the mathematics involved in chemical reactions. This includes examining how changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.

Enduring Understandings:

- Chemical and physical transformations may be observed in several ways and typically involve a change in energy.
- Chemical changes are represented by a balanced chemical equation that identifies the ratios with which reactants react and products form
- Chemical reactions can be classified by considering what the reactants are, what the products are, or how they change from one into the other.

Essential Questions:

- How do you know a chemical reaction took place?
- How do you predict what products are formed during a chemical reaction?
- What are the qualitative and quantitative observations I can make during a chemical reaction?
- What is a mole and why do chemists use the mole concept?

Standards/Indicators/Student Learning Objectives (SLOs):

SCI.HS-PS1-2	Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
SCI.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.HS-PS1-7	Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Lesson Titles:

- Acid / Base Reactions
- Mathematics of Chemical Reactions
- Mole Calculations
- Net Ionic Reactions
- Redox Reactions
- Types of Reactions

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Inter-Disciplinary Connections:

LA.RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
LA.RST.11-12.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
LA.WHST.11-12.1.A	Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
LA.WHST.11-12.1.B	Develop claim(s) and counterclaims using sound reasoning and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
LA.WHST.11-12.1.C	Use transitions (e.g., words, phrases, clauses) to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
LA.WHST.11-12.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Chromebook Activity
- Computer Simulations
- Delsea One Tutoring
- Independent Studies
- Lectures
- Problem Solving
- Science Labs

Modifications

ELL Modifications:

- Digital translators
- Focus on domain specific vocabulary and keywords
- Offer resources for specific topics in primary language (Youtube web resources)
- Repeat, reword, clarify
- Use real objects when possible

IEP & 504 Modifications:

- have formula's available on the test and/or sample problems
- modeling and showing lots of examples
- scaffolded notes
- students could use calculator and/or other math tools

G&T Modifications:

- Extra Labs to Do Outside the Classroom
- Give students Challenge Problems
- Send Links to Videos of Interest

At Risk Modifications

- Have Students See Me During Delsea One

- Reach out to Parents

Formative Assessment:

- Anticipatory Set
- Closure
- Determining Molecular Mass Lab
- Net Ionic Reactions Lab
- Quizzes on topics throughout the Unit
- Redox Reaction Lab
- Warm-Up

Summative Assessment:

- Alternate Assessment
- Benchmark assessment on topics covered
- Marking Period Assessment

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

Resources & Materials:

- AP Chemistry Website designed for the class - <https://sites.google.com/site/delseapchemistry/>
- Lab Equipment
- PhET Lab Simulations - <https://phet.colorado.edu/en/simulations/category/chemistry>
- Vernier Chemistry Probes

Technology:

- Chromebooks
- Desmos
- Graphing Calculators
- Interactive Boards
- Pocket Lab
- Smart Phones
- Venier Probes

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A.4	Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
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.B.CS2	Create original works as a means of personal or group expression.
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.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.12.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.
TECH.8.1.12.D.CS2	Demonstrate personal responsibility for lifelong learning.
TECH.8.1.12.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.12.E.CS2	Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.1	Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.2.12	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.12.A.2	Analyze a current technology and the resources used, to identify the trade-offs in terms of

availability, cost, desirability and waste.

TECH.8.2.12.C

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

TECH.8.2.12.C.4

Explain and identify interdependent systems and their functions.

TECH.8.2.12.C.CS3

The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.

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.

TECH.8.2.12.E.1

Demonstrate an understanding of the problem-solving capacity of computers in our world.

TECH.8.2.12.E.3

Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).

TECH.8.2.12.E.CS1

Computational thinking and computer programming as tools used in design and engineering.