# Unit 8: Redox Reactions & Electrochemistry

Content Area: **Template**
Course(s):
Time Period:
Length:
Status: **Published**

## State Mandated Topics Addressed in this Unit

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|---|---|
| N/A | N/A |

## Unit 8: Redox Reactions & Electrochemistry

## Essential Questions

- How can electrical work be harnessed from spontaneous redox?
- How do half-reactions combine to form a full cell reaction?
- In what ways do redox reactions impact everyday life?
- What defines oxidation and reduction at the electron level?
- What factors determine the amount of substance produced in electrolysis?
- Why do different metals produce different voltages?

## Objectives

- Assign oxidation numbers to all atoms in a reaction.
- Balance redox reactions using the half-reaction method.
- Compare the spontaneity of cells based on standard potentials.
- Construct and analyze voltaic (galvanic) cells, calculating E°cell.
- Perform simple electrolysis experiments and calculate charge passed.
- Relate redox processes to real applications (batteries, corrosion, electroplating).

## Standards

| | |
|---|---|
| SCI.HS-PS3-5 | Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. |
| SCI.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. |
| 9-12.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. |
| 9-12.HS-PS1-7 | Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. |

## Instructional Tasks/Activities

- Battery Comparison Data Analysis
- Cell Potential Measurement Activity
- Corrosion & Prevention Case Study
- Electrolysis of Water Experiment
- Electroplating Demonstration & Discussion
- Essential Question Group Discussion
- Half-Reaction Balancing
- Oxidation State “Who Am I?” Game
- Voltaic Cell Construction Lab

## Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Flashcards and/or drill and practice
- Inquiry based activities with reflective discussion
- Journal / Student Reflection
- Kahoot
- Laboratory groups
- Lecture with note taking or guided notes
- Online models and simulators
- Other named in lesson
- Peer Review
- Performance
- Power Point Presentsation
- Problem Correction
- Project

- Quiz
- Rubric
- Teacher Collected Data
- Test
- Whole and small group discussions
- Worksheet

## Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

## Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

## Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning

- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

## Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

## Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

## Honors Modifications

## Resources

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5