



Lesson Plan: Backwards Design

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Grade Level/Subject Area: 11th Chemistry Date: 5/14/14

Lesson Topic: Oxidation/Reduction & Chemiosmosis Content Standard: Chemistry 7, 3a and Biology 3a and i

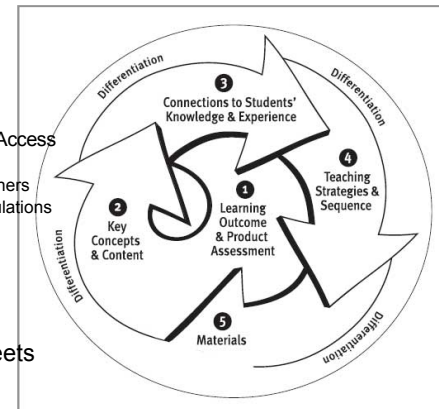
Adopted Text(s): Zumdahl, Chemistry Supplemental Materials/Technology: classzone.com, chemiosmosis Worksheets

Note: Use the Essential Components of Differentiated Instruction in the FAS Resource section of your padfolio to help differentiate instructional strategies, content, products or assessments.

California Induction Program Standards

Check all that apply:

- Standard 5: Pedagogy
- Standard 6: Universal Access Equity for All Students
- Teaching English Learners
- Teaching Special Populations



<p>Learning Outcomes Students write a lab report. Compare/contrast two chemical processes. Write a one page summary of a new related example. Clearly label their diagrams. Using technical vocabulary in lab report and essay. Preparation for Ch 18.</p>	<p>Key Concepts & Essential Questions All life needs chemical reactions. Energy is constantly being transformed from one form to another (in this case electrons are changing places). Chemiosmosis is a physical process that allows for a transformation from electrical into chemical energy in the form of ATP.</p>	<p>Connections to Students' Knowledge, Skills, Experience</p> <p>Students can give a couple of examples where life uses or makes chemical energy.</p> <p>Students have previewed the lab and have experience with balancing equations, so they have a good idea that the hydrogen gas make will double the oxygen gas.</p> <p>Students will visualize the connection between electron movement in the chloroplast and in the lab set-up and think about energy transferred.</p>
<p>Evidence of Learning (Product or Assessment)</p> <ul style="list-style-type: none"> -Video summary -Half reactions written & diagram of set-up -Results table filled in -Quick recall of is being oxidized/reduced and being able to use this skill with other common examples. -In-class response to photolysis/electrolysis summary questions -Final lab report. -Summary paper. 	<p>Teaching Strategies & Sequence</p> <p>Opening Teacher reviews video and collects summaries. Class goes over introductory questions (from the website). Then they review some previous redox reactions and their oxidation states.</p> <p>Instruction Students diagram the set-up in their lab journal. Students read through the lab handout. Students recall answers to questions while filling in/color coding their diagram. They write out the half reactions and sum up their voltages and determine which battery(ies) to use. Students gather materials and set up the experiment. Students get a results table and fill in their hypothesis about the results.</p> <p>Guided Practice Teacher has a demo set up in front of class for students to refer to. Teacher shows how to completely label/color code the electrolytic cell.</p> <p>As students wait for their gas evolution, they read about a similar process in plants called photolysis. Teacher guides: In our lab _____energy is transformed into _____energy. In photolysis _____energy is transformed into _____energy. Both processes use water.</p> <p>Teacher goes through the entire lab diagram to color/trace the flow of electrons and formation of new chemicals. Students read the chemiosmosis handout and color/trace the flow of electrons through the thylakoid membrane in their groups or pairs.</p> <p>Closure Summary questions to compare/contrast these processes answered in class. Students may also practice/preview their online quiz.</p>	<p>Ways to differentiate instruction</p> <ul style="list-style-type: none"> -Video preview with questions. -Audio Ch summary in Spanish (students may submit summary notes) http://www.classzone.com/cz/books/woc_07/quiz.htm?title=Chapter%20Quiz&ch=4&estId=17967 -Main concepts are shown in class and reviewed continually as they apply to the lesson. -Problem solving-materials & lab set-up. Group roles are needed here. -Fill-in and verbalize results table as a clear hypothesis. -Compare photolysis and electrolysis with side by side diagrams of each.

	<p>Extension Activities or Independent Practice Students begin to identify other forms of energy transformed around them, in living things and modern technology. They can describe the transformation taking place with more vocabulary and details. Students submit a 1 1/2 page paper on another energy transformation.</p>	
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<p>Materials batteries (different voltages), electric cables, graphite pencils sharpened at both ends, bicarbonate, water, pH indicator, test tubes, small cups with two holes for each pencil, plumbers putty, lab handout, results table, chemiosmosis coloring, chemiosmosis handout.</p>
