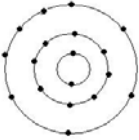


## Unit # - 2 – Chemistry of Matter

Standards Addressed	Student Learning Objectives for this Unit	Content Skills and Knowledge	Learning Activities and Instructional Strategies
<p>NSES Standards: Properties &amp; Changes of Properties in Matter Transfer of Energy</p> <p>PA STEE Standards: 3.2.7.A (sci. k) 3.2.7.B (app k) 3.4.7.A (str mat) 3.4.7.B (e sources and transfers) 3.4.7.B (e ht trn) 3.1.7.B (models) 3.7.7.B (instr)</p> <p>1.2 read crit 1.4 writing 1.8 presentation</p>	<p>Students will be able to...</p> <p>Part 1: Chemical Bonding (2 weeks)</p> <ul style="list-style-type: none"> <li>▪ Describe atomic structure and placement on the first three energy levels</li> <li>▪ Describe chemical bonding</li> <li>▪ Identify number of valence electrons in an atom</li> <li>▪ Predict whether an atom is likely to form bonds</li> <li>▪ Describe ionic and covalent bonds</li> </ul> <p><b>Developmental Considerations for these topics:</b></p> <ol style="list-style-type: none"> <li>I. Students would learn the first 18 elements</li> <li>II. Examples, demos, and labs for this unit would try to highlight the first 18 elements</li> <li>III. No s,p,d,f orbitals would be discussed in this unit</li> <li>IV. Chemical reactions (whether demo or labs) would become a central focus to highlight the concepts in Part 2 and 3</li> </ol> <p>Part 2: Chemical Reactions (4 weeks)</p> <ul style="list-style-type: none"> <li>▪ Identify the clues that indicate a chemical reaction might be taking place</li> <li>▪ Interpret and write simple chemical formula</li> <li>▪ Interpret and write <b>simple</b> balanced chemical equations</li> <li>▪ Explain how a balanced equation illustrates the law of conservation of mass</li> <li>▪ Compare exothermic and endothermic reactions</li> <li>▪ Describe the factors that affect the rate of a reaction.</li> </ul>	<p>Part 1:</p> <p><b>Knowledge</b> Protons, electrons, and neutrons on the first three energy levels Chemical bond, chemical bonding, valence electrons, ions Ionic bond, ions, covalent bond, molecule, crystal lattice, metallic bond</p> <p><b>Skills</b> Diagram and analyze atoms up to element 18 – Argon, using first three energy levels</p>  <p>Part 2:</p> <p><b>Knowledge</b> Chemical Reaction, chemical formula, chemical equation Reactants, products Law of conservation of mass Exothermic, endothermic, law of conservation of energy, catalyst, inhibitor</p> <p><b>Skills</b> Balance <b>simple</b> chemical equations</p>	<p>Part 1:<b>Lab or Demonstration:</b> For Part 1,2,or 3: Burning Mg ribbon: Electrolysis: Sulfuric and Sugar: Flame Tests: <math>K_2(CLO_4)</math> &amp; wood splints, methane bubbles: pH <b>Reading:</b> Dancing Elements Is it and Ion? <b>Worksheet:</b> Chemical Bonding: Directed Reading <b>Technology:</b> Electrolysis <a href="http://www.tryscience.org/experiments/experiments_electrolysis_online.html">http://www.tryscience.org/experiments/experiments_electrolysis_online.html</a></p> <p>Part 2: <b>Lab or Demonstration:</b> Reactions: Double Replacement Demo (yellow color) For Part 1,2,or 3: Burning Mg ribbon: Electrolysis: Sulfuric and Sugar: Flame Tests: <math>K_2(CLO_4)</math> &amp; wood splints, methane bubbles: pH <b>Reading:</b> Chemical Reactions: Directed Reading <b>Worksheet:</b> Chemical Reactions: Puzzlers <b>Technology:</b> Chemical Bonding <a href="http://csep10.phys.utk.edu/krogh_instructorCD/biology/ch2/animations/mod02_2.swf">http://csep10.phys.utk.edu/krogh_instructorCD/biology/ch2/animations/mod02_2.swf</a></p>

## Unit # - 2

## Chemistry of Matter

Standards Addressed	Student Learning Objectives for this Unit	Content Skills and Knowledge	Learning Activities and Instructional Strategies
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## Unit # - 2 - Chemistry

### Unit Modifications

- Chemical Bonding: Directed Reading
- Chemical Bonding: Vocabulary and Notes
- Chemical Reactions: Directed Reading
- Acids and Bases in Solution

### Unit Enrichments

- Electrolysis: Virtual Lab
  - [http://www.tryscience.org/experiments/experiments\\_electrolysis\\_online.html](http://www.tryscience.org/experiments/experiments_electrolysis_online.html)
- Radioactivity Tutorial
  - <http://www.darvill.clara.net/nucrad/types.htm>
- Swimming Pool Basics

### Suggested Assessment Techniques for Unit

**Core 1: Performance Assessment: Alien pH (Chemistry)**

Core 2: Performance Assessment: Trouble in Flume Country (Forces and Motion)

**Core 3: Unit Assessment: Chemistry**

### Materials/Technology for Unit

- Electrolysis Virtual Lab
  - [http://www.tryscience.org/experiments/experiments\\_electrolysis\\_online.html](http://www.tryscience.org/experiments/experiments_electrolysis_online.html)
- Chemical Bonding
  - [http://csep10.phys.utk.edu/krogh\\_instructorCD/biology/ch2/animations/mod02\\_2.swf](http://csep10.phys.utk.edu/krogh_instructorCD/biology/ch2/animations/mod02_2.swf)
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