Learning Target: I can understand why a current passes through a system on a molecular level.

Homework: n/a

As you enter... (Write down questions and answers) WELCOME BACK!!!

Using lab 20...

What was the major discovery of Galvani? What about Volta?

Current flows between 2 metals in a moist environment.

Made battery. Termin word "volt".

Reminder: 2 weeks left of 3rd marking period

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Statement of Inquiry: Energy allows for the movement of the parts of a system which is used to manipulate chemical reactions for scientific and technological uses.

3rd period:
- Intro new unit: Electrochemistry (20 min)

3rd/4th period:
- Lab 20: Electrochemistry Exploration (75 min)
  - Do 1 experiment
  - Regroup and discuss
  - Do last 2 experiments

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Tix out the door (Don't forget your name.)

Thinking about the molecular level, what allows a current to pass through a system?

Explain your answer with an example from the lab.
Electrochemistry

Class discussion: Looking at the parts of this word... what do you think this unit will be focusing on?

Pair and share: Analyze this diagram with a person sitting next to you. Make 2 inferences about what may be happening in the diagram below.
Learning Target: I can apply the rules for assigning oxidation numbers.

Homework: Worksheet due Friday, April 10th.

As you enter... (Write down questions and answers)
Thinking about the lab, explain the role of the lemon in an electrochemical cell. Draw a particle diagram that represents what is happening within the lemon.

Role: lemon has acid (like an electrolyte)

Reminder: 2 weeks left of 3rd marking period.

Tuesday, April 7th
Learning Target: I can apply the rules for assigning oxidation numbers.

Homework: Worksheet due Friday, April 10th

As you enter... (Write down questions and answers)
Thinking about the lab, explain the role of the lemon in an electrochemical cell. Draw a particle diagram that represents what is happening within the lemon.

Role: lemon has acid (like an electrolyte)

Reminder: 2 weeks left of 3rd marking period.

Statement of Inquiry: Energy allows for the movement of the parts of a system which is used to manipulate chemical reactions for scientific and technological uses.

3rd period:
• Finish lab 20 and hand in (10 min)
• Notes and Practice on Oxidation Numbers (30 min)
• Exit Tix (5 min)

Tix out the door (Don't forget your name.)

Assign the oxidation number for each element within the following three compounds.

1. H₂
2. Na₂O
3. MgF₂
Electrochemical cells conduct a current through the transfer of electrons. We can use oxidation numbers to determine how many electrons are transferred in a given reaction.

### Table 4.2 | Rules for Assigning Oxidation States

<table>
<thead>
<tr>
<th>The Oxidation State of...</th>
<th>Summary</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>An atom In an element is zero</td>
<td>Element: 0</td>
<td>Na(0), O(0), O(0), Hg(0)</td>
</tr>
<tr>
<td>A monatomic ion is the same as its charge</td>
<td>Monatomic ion: charge of ion</td>
<td>Na⁺, Cl⁻</td>
</tr>
<tr>
<td>Fluorine is −1 in its compounds</td>
<td>Fluorine: −1</td>
<td>HF, PF₃</td>
</tr>
<tr>
<td>Oxygen is usually −2 in its compounds</td>
<td>Oxygen: −2</td>
<td>H₂O, CO₂</td>
</tr>
<tr>
<td>Hydrogen is +1 in its covalent compounds</td>
<td>Hydrogen: +1</td>
<td>H₂O, HCl, NH₃</td>
</tr>
</tbody>
</table>

Assign oxidation states to all atoms in the following.

<table>
<thead>
<tr>
<th>a. CO₂</th>
<th>C: +4</th>
<th>O: −2</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. SF₆</td>
<td>S: +6</td>
<td>F: −1</td>
</tr>
<tr>
<td>c. NO₃⁻</td>
<td>N: 0</td>
<td>O: −2</td>
</tr>
</tbody>
</table>

\((-S)+3(-2)=5\)
Learning Target: I can apply the rules for assigning oxidation numbers using my reference tables.

Homework: Worksheet due Friday, April 10th

As you enter... (Write down questions and answers)

Using your reference tables and the Rules from yesterday...

Determine the oxidation numbers for each element in the following compounds.

1. \( \text{F}_2 \)  
   \( \text{O}^{2-} \)

2. \( \text{H}_2\text{O} \)
   \( \text{H}^{+} \text{O}^{2-} \rightarrow 0 \)

3. \( \text{Na}_2\text{O} \)
   \( \text{Na}^{+} \text{O}^{2-} \rightarrow 0 \)

Statement of Inquiry: Energy allows for the movement of the parts of a system which is used to manipulate chemical reactions for scientific and technological uses.

3rd period:
- Practice Oxidation Numbers (20 min)

3rd/4th period
- Oxidation Stations (20 min each)
- 1. Mahjong on computers (in pairs)
- 2. Kahoot Game with Ms. Eng
- 3. Bingo at the Lab tables
- Exit Tix (5 min)

Tix out the door (Don't forget your name.)

Assign the oxidation number for each element within the following three compounds.

1. \( \text{H}_2 \)
2. \( \text{Na}_2\text{O} \)
3. \( \text{MgF}_2 \)
Statement of Inquiry: Energy allows for the movement of the parts of a system which is used to manipulate chemical reactions for scientific and technological uses.

3rd period:
- Practice Writing Half-Reactions (45 min)
- 5 min Break... Once you have finished up to #9

4th period:
- More & more practice writing half-reactions! (45 min)
- Exit Tix (5 min)

Tix out the door (Don’t forget your name.)

Write the half-reactions for the following reaction. Identify which is oxidation and which is reduction.

$$\text{Al} + \text{Pb}^{2+} \rightarrow \text{Al}^{3+} + \text{Pb}$$

Oxidation:

Reduction:
Electrochemistry: Half-Reactions

1. What is a redox reaction?
   Reaction that transfers electrons

2. Write the name for each ion.
   Example: NaCl

3. Why would a unit and combine more quickly in an aqueous solution?
   Sulfuric acid has ions that allow e⁻ to flow and react.

4. Write the ionic equation of each reaction.
   a. NaCl + AgNO₃ → NaNO₃ + AgCl
   b. H₂SO₄ + Cu(OH)₂ → CuSO₄ + H₂O
   c. H₂ + O₂ → H₂O
   d. HCl + NaOH → NaCl + H₂O
   e. NH₄NO₃ → N₂ + H₂O

5. Determine the oxidation number of each element in each equation.
   a. O₂⁻ + 2e⁻ → O₂
   b. Cl₂ + 2e⁻ → Cl⁻
   c. CO₂ + 2e⁻ → CO + 2OH⁻
   d. NO₂ + e⁻ → NO + OH⁻

6. Write the ionic equation of each reaction.
   a. Fe + 2H⁺ → Fe²⁺ + H₂
   b. Zn + 2H⁺ → Zn²⁺ + H₂
   c. Cu + 2NO₃⁻ → Cu²⁺ + 2NO₂
   d. Al + 3OH⁻ → Al(OH)₃

7. Use the charges in the oxidation numbers to identify which species is oxidized and which is reduced. Then, determine which species is the oxidizing agent and which is the reducing agent. (Show your work.)

8. Redox reactions:
   a. 2H₂ + O₂ → 2H₂O
   b. 2H₂ + O₂ → 2H₂O
   c. 2Li + 2Li⁺ → 2Li²⁺
   d. 2Cu + 2H₂O → 2Cu²⁺ + 2H₂O

9. Write the oxidation number above each element. Then, determine if each equation represents a redox reaction (circle yes or no).
   a. 2KClO₃ → 2KCl + 3O₂ 
   b. BaCl₂ + 2KNO₃ → Ba(NO₃)₂ + 2KCl
   c. HCl + NaOH → H₂O + NaCl
   d. Mg + Br₂ → MgBr₂
   e. NH₄NO₃ → N₂ + H₂O

10. Balance the following redox reactions by the half-reaction method, rewriting the balanced equations below the given unbalanced equation. Show your work below each reaction and put coefficients in the spaces provided:

   1) __Ag⁺ + __Cl⁻ → __Ag⁺ + __Cl⁻

   2) __Fe + __PbO₂ → __Fe²⁺ + __Pb

   3) __Ag⁺ → __Ag → __Ag⁺ + __Ag

   4) __H₂O → __H₂ + __O²⁻

   5) __Al + __H⁺ → __Al³⁺ + __H₂