

## Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM Lesson Plan

**Lesson Title:** 5.1 Solution Chemistry    **Lesson #** 1    **Date:** Jan 11  
**Name:** Jany Pierce    **Subject:** Chem    **Grade(s):** 11

**Rationale:**

This lesson plan is important because it is introducing important vocabulary words, the difference between conductors and nonconductors and finally how to write dissociation equations. Vocabulary words are important to increase their knowledge, while also introducing English into a Science class. Learning how to write dissociation equations are important for the rest of their chemistry career. This lesson includes an FPPL.

**Core Competencies:**

Communication	Thinking	Personal & Social
<p><b>Connecting and engaging with others:</b> students engage in informal and structured conversations where they listen, contribute and develop understanding and relationships, and learn to consider diverse perspectives.</p> <p><b>Acquiring and presenting information:</b> students communicate by receiving and presenting information.</p> <p><b>Working collectively:</b> students combine their efforts with those of others to effectively accomplish learning and tasks.</p>	<p><b>Analyzing and critiquing:</b> students learn to analyze and make judgements about work.</p> <p><b>Questioning and investigating:</b> students learn to engage in inquiry when they identify and investigate questions, challenges or problematic situations in their studies.</p>	<p><b>Identifying personal strengths and abilities:</b> students acknowledge their strengths and abilities, they intentionally consider these as assets, which aid them in other aspects of their lives.</p>

**Big Ideas (Understand):**

The mole is a quantity used to make atoms and molecules measurable.

**Learning Standards:**

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
<ul style="list-style-type: none"> <li>• Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data</li> <li>• Seek and analyze patterns, trends and connections in data, including describing relationships between variables, performing calculations and identifying inconsistencies</li> </ul>	<ul style="list-style-type: none"> <li>• <b>The mole</b></li> <li>• <b>Reactions</b></li> <li>• <b>Local and other chemical processes</b></li> </ul>

### Instructional Objectives & Assessment:

Instructional Objectives (students will be able to...)	Assessment
<ul style="list-style-type: none"><li>• Identify key vocabulary words that pertain to this type of chemistry</li><li>• Identify conductors and nonconductors</li><li>• Write dissociation equations</li><li>• Understand the effect of concentration</li><li>• Connect these ideas to the real world</li></ul>	<ul style="list-style-type: none"><li>• <b>Fill in the blank vocabulary notes</b></li><li>• <b>Answer questions about conductors and nonconductors</b></li><li>• <b>Fill in examples of dissociation equations that are within their note package</b></li><li>• <b>Completing a lab about the effect of concentration</b></li><li>• <b>Kahoot (but mainly for fun)</b></li></ul>

### Prerequisite Concepts and Skills:

Students should know basic chemistry vocabulary i.e. covalent, ionic, ions, etc.  
Students should know what an acid and a base are, what nonmetals and metals are  
Be able to read and follow a laboratory procedure and follow safety precautions  
Students should be able to follow along during notes

### Indigenous Connections/ First Peoples Principles of Learning:

As far as I am concerned this does not directly tie to any Indigenous Connections – If I had the time, I would tie in water conductivity and the different ions within the water into a water sample lab and have it tie into indigenous connections but with only one hour it is difficult  
FPPL: learning involves patience and time.

### Universal Design for Learning (UDL):

- **There is a demo to show how to use the Vernier Conductivity Probe that is used later for the laboratory**
- **I am verbally going over the notes while providing a printed version**
- **I have prepared extra questions for more practice if people are still having troubles**
- **The lab procedure is printed out and is step by step, while I will also be explaining this procedure to them verbally and walking around the class to help them**
- **I am using Kahoot instead of a regular paper pen quiz – although I am not taking marks, it is mainly to see where they are after the lesson**

### Differentiate Instruction (DI):

- Allow 'thinking time', time between asking questions and expecting an answer
- The laboratory allows the students to get up and move around
- Provide a list of the days plans at the beginning of the class
- I will be at the front of the class writing the notes on the tablet – so no unnecessary movement from me
- No homework – allowing time for the students to write up their lab report in class

### Materials and Resources:

- Note package
- Laboratory procedure
- Laboratory materials (mentioned within the lab procedure i.e. computer, Vernier computer interface, Logger Pro etc.
- Tablet and projector
- Kahoot – little quiz for right before the laboratory



<p>water and does not break down into ions like the salt does. Does that make sense? Are there any questions about that?</p> <ul style="list-style-type: none"> <li>• So, if we flip the page, we will now fully learn what conductors and non-conductors are. FILL IN THE NOTES – This little rectangle is crazy important because it will help you guys figure out what will conduct and what will not. So, a metal will conduct electricity – which I am sure you guys probably already knew, if the phase of the compound is a solid then it will not conduct electricity unless it is a metal. When the compound is a liquid or aqueous, it needs to be an acid or a base to conduct electricity, as well as being an ionic compound. Let's fill in these examples.</li> <li>• First three do not conduct, KCl (aq) does conduct, HCl (aq) does conduct, does not conduct, and Cu (s) does conduct. There are a few more questions in the textbook if you guys want or need more practice.</li> <li>• Now, let's move onto dissociation equations. An ionic solution is made of ions, a molecular solution only contains molecules i.e. no ions. Ionic compounds will dissociate to form ions, but molecular (covalent) compounds will not. Now we have a few examples to look at to fully understand this topic. FeBr<sub>3</sub> is ionic, Na<sub>3</sub>PO<sub>4</sub> is ionic, acetic acid is, because it is an acid, sulfuric acid is ionic because the H acts as a metal, and PCl<sub>3</sub> is a molecular compound.</li> <li>• Now before we move onto the lab, I have set up a Kahoot for a little bit of fun – probably more fun to me than you guys, but that's okay.</li> </ul>		
<p>Body:</p> <ul style="list-style-type: none"> <li>• Hand out the lab procedure. ~ 20 mins There will be groups of 2-4, the groups have already been prepared and are ready to go to avoid delay</li> <li>• Briefly explain the lab, mention that there are only four computers set up – so some of you guys can just do some practice at the desks, and the rest can start the lab. The back side of the white sheet fully explains what you guys need to click on</li> </ul>	<ul style="list-style-type: none"> <li>• Listen to the explanation of the lab</li> <li>• Grab goggles and get into partners</li> <li>• Either do the experiment or review at their desk</li> </ul>	5 mins

<p>the computers and how to set it up etc. it is step by step.</p> <ul style="list-style-type: none"> <li>Let them do their lab and alternate with the students doing review.</li> </ul>		25 mins
<p>Closure:</p> <ul style="list-style-type: none"> <li>Have the class do a quick clean up if there are any messes</li> <li>Remind them that they will be with me again Tuesday morning and that we will be moving onto how to calculate concentrations</li> </ul>	<ul style="list-style-type: none"> <li>Clean up and quickly listen to me about Tuesday</li> </ul>	5 mins

**Organizational Strategies:**

- Log-in to Kahoot to have it ready and loaded (I have already created the kahoot)
- Have the lab setup ahead of time (already done), all of the papers printed (already done)
- Have my copy of the notes filled out, to make it a bit faster in filling out the notes
- Prepare some questions to ask/ prepare for some questions they may ask

**Proactive, Positive Classroom Learning Environment Strategies:**

- Letting the students know ahead of time that I will be asking questions but do not necessarily expect them to answer
- Using Kahoot for something fun and exciting
- No negative feedback if anyone answers incorrectly, just say not quite and lead them in the right direction – and assure them that it is not an easy topic and that I have created more practice questions if people are still having difficulties

**Extensions:**

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**Reflections (if necessary, continue on separate sheet):**

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