

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

Lesson Title:	5.1 Solution Chemistry	Lesson #	1	Date:	Jan 11
Name:	Janys 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
Connecting and engaging with	Analyzing and critiquing:	Identifying personal strengths
others: students engage in informal	students learn to analyze and	and abilities: students
and structured conversations where	make judgements about work.	acknowledge their strengths and
they listen, contribute and develop	Questioning and investigating:	abilities, they intentionally
understanding and relationships,	students learn to engage in	consider these as assets, which
and learn to consider diverse	inquiry when they identify and	aid them in other aspects of their
perspectives.	investigate questions, challenges	lives.
Acquiring and presenting	or problematic situations in their	
information: students communicate	studies.	
by receiving and presenting		
information.		
Working collectively: students		
combine their efforts with those of		
others to effectively accomplish		
learning and tasks.		

Big Ideas (Understand):

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

Learning Standards:

(DO) (KNOW)

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Learning Standards - Curricular Competencies Lea	rning Standards - Content
 Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data Seek and analyze patterns, trends and connections in data, including describing relationships between variables, performing calculations and identifying inconsistencies 	 The mole Reactions Local and other chemical processes

Instructional Objectives & Assessment:

Instructional Objectives (students will be able to)	Assessment
 Identify key vocabulary words that pertain to 	Fill in the blank vocabulary notes
this type of chemistry	 Answer questions about conductors and
 Identify conductors and nonconductors 	nonconductors
Write dissociation equations	Fill in examples of dissociation equations
Understand the effect of concentration	that are within their note package
Connect these ideas to the real world	 Completing a lab about the effect of
	concentration
	 Kahoot (but mainly for fun)

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

Lesson Activities:

Teacher Activities	Student Activities	Time
Introduction (anticipatory set – "HOOK"):		
Introduction (anticipatory set – "HOOK"): Re-introduce myself: As you guys know, I have been observing and helping out around the classroom – today and tomorrow I will be teaching a one-hour lesson. I will admit, I am crazy nervous but that is okay, we will be patient together and see how this goes. I will ask questions because I find that is the easiest way to learn and I found it stuck better for me – I hope you guys will feel comfortable answering but do not feel like you have to. We are first going to grab out our note package for unit 5, this unit is all about solutions and the first lesson we are doing is just the conductivity of solutions. There are a few definitions here that we are going to fill out, you won't be directly tested on them, but they are important words you should know for other units and courses down the road. I am going to do a quick demo to show the conductivity of different solutions – first we can guess on whether we think these solutions will conduct electricity or not and why we guessed that DO THE DEMO – Do we know the difference between distilled water and tap water? We can see that tap water does conduct – can we guess why that is? Because of the ions that are floating within the solution. Tap water can have Ca+2, Mg+2, Na+, K+, Cl-, NO3-, SO4-2, and	Listen to the intro and the note section, fill in the notes and follow along, do the examples within the notes Ask any questions and hopefully answer some of the questions I have for them Play Kahoot	5 mins 5 mins
Mg+2, Na+, K+, Cl-, NO3-, SO4-2, and HCO3- Do you guys know where some of these ions come from? Have you heard of hard water or soft water? That is where a majority of these ions do come from. Distilled does not, because it is completely free of ions. This is because of the way distilled water is made – regular tap water is boiled and condensed with the collection of the steam which then goes back to a liquid, this whole process removes impurities and minerals from the water. Salt water does conduct electricity because of the Na+ and Cl- ions within the water. Sugar water does not because the sugar has completely dissolved within the		

- water and does not break down into ions like the salt does. Does that make sense? Are there any questions about that?
- So, if we flip the page, we will now fully learn what conductors and nonconductors 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 electivity, as well as being an ionic compound. Let's fill in these examples.
- 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.
- 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. FeBr3 is ionic, Na3PO4 is ionic, acetic acid is, because it is an acid, sulfuric acid is ionic because the H acts as a metal, and PCI3 is a molecular compound.
- 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.

Body:

- 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
- 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
- Listen to the explanation of the lab
- Grab goggles and get into partners
- Either do the experiment or review at their desk

5 mins

 the computers and how to set it up etc. it is step by step. Let them do their lab and alternate with the students doing review. 		25 mins
Closure:		
 Have the class do a quick clean up if there are any messes Remind them that they will be with me again Tuesday morning and that we will be moving onto how to calculate concentrations 	 Clean up and quickly listen to me about Tuesday 	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:	
Reflections (if necessary, continue on separate sheet):	
The receipts (in recessary) contained on separate sheet).	