

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

Lesson Title: _____ Ohms Law **Lesson #** _____ 5 **Date:** _____ Feb 25, 2021
Name: _____ Janys Pierce **Subject:** _____ Physics **Grade(s):** _____ 9

Rationale:

This lesson plan is important because it is introducing the students to Ohm’s Law. They will learn how to manipulate formulas and see the different relationship between variables. There are also important vocabulary words that will be added into their knowledge, this also introduces English into a Science class.

Core Competencies:

Communication	Thinking	Personal & Social
<ul style="list-style-type: none"> Connecting and engaging with others Focusing on intent and purpose 	<ul style="list-style-type: none"> Creating and innovating Generating and incubating Evaluating and developing 	<ul style="list-style-type: none"> Self-regulating

Big Ideas (Understand):

Electric current is the flow of electric charge.

Learning Standards:

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
<ul style="list-style-type: none"> Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data Transfer and apply learning to new situations 	<ul style="list-style-type: none"> Voltage, current and resistance Circuits – must be complete for electrons to flow

Instructional Objectives & Assessment:

Instructional Objectives (students will be able to...)	Assessment
<ul style="list-style-type: none"> Use the Ohms Law formula $V=IR$ Understand the difference between parallel circuits and series circuits Understand what resistance is when applying it to electrical concepts 	<ul style="list-style-type: none"> Practice within notes and on a hand-out Simulation on PHET Simulation on PHET Hands on circuit application

Prerequisite Concepts and Skills:

Students should know basic physics and basic English
 Students should know specific vocabulary from earlier within the unit (voltage, current, resistance etc.)
 Students should know how to draw circuits (from previous day) and what each symbol means
 Students should be able to follow a procedure and simulation online

Indigenous Connections/ First Peoples Principles of Learning:

Unfortunately, I do not think this lesson plan ties in any FPPLs. I am also unsure as to how I could Indigenize this lesson plan.

Universal Design for Learning (UDL):

- I will demo how to use the PHET simulation and the hands-on material that we will be using in the lab
- I am verbalizing the notes while they have the note package in front of them to fill out and read along with
- I have prepared extra questions for more practice problems if students are still having difficulty with the math
- The procedure is step by step, I will also be there for questions and I will be explaining the lab in full, aloud

Differentiate Instruction (DI):

- Allow 'thinking time', time between asking questions and expecting an answer
- Allow students to think about their answer and to discuss it with their partner to determine if it is right and then have them announce it to me
- Provide a list of the days plan at the beginning of the class so the students know what I am expecting of them and what we plan to accomplish
- I will be at the front of the class writing on a tablet for notes – this reduces unnecessary movement from me / no distraction for the students
- Allow the students time to play with the circuits

Materials and Resources:

- Note package
- Extra practice problems (printed)
- Laboratory procedure
- Laboratory materials (computers, circuit materials etc.)
- Tablet and projector (for me)
- PHET simulation (resource)

Lesson Activities:

Teacher Activities	Student Activities	Time
<p>Introduction (anticipatory set – “HOOK”):</p> <ul style="list-style-type: none"> • Re-introduce myself: As you know I have been observing and helping out around the classroom, today and next Thursday I will be teaching half of your lesson and Mrs. Hopp will finish us off. I ask a lot of questions because I find this was the way I learnt best – do not feel that you need to answer every question I ask. • Have them open up their notes and move to the portion about Ohm’s law • Introduce them to Ohm’s Law and the formula and what each variable means, help them to manipulate the formula • Start the practice problems within the notes – add in the few that I created for more practice, see how they are feeling with the math and the concept that I introduced them to 	<ul style="list-style-type: none"> • Listen to introduction • Open up notes and follow along • Follow along with the practice problems and ask any questions they may have or problems with manipulating the formula • Do the extra practice problems I prepared for them • Continue on in the notes onto parallel and series circuits 	<p>2 mins 15- 20 mins</p> <p>10-15 mins</p>

<p>Body:</p> <ul style="list-style-type: none"> • Hand out the lab procedure, and do a demo with the equipment, this is likely the first time the students are seeing these items and will have no idea on how to use them – especially the voltmeters and ammeters • Get the students to grab a laptop, either individually or as a group, does not matter • Have them open up PHET https://phet.colorado.edu/en/simulation/circuit-construction-kit-dc and use the Circuit DC program – they have used this program before, so I am not worried about explaining this portion of the lab • I will then get the students into their premade groups and let them play with the circuits for a bit by themselves and then remind them that they do have a lab to complete and questions to complete within the lab • Let the students do the circuits – walk around and observe and answer any questions, aid them in understanding why the circuit isn't working, how to calculate the current etc. 	<ul style="list-style-type: none"> • Listen and watch the demo • Collect laptops and move to the station they are assigned with their groups • Play with the circuits and complete the lab 	<p>5-7 mins</p> <p>40 mins</p>
<p>Closure:</p> <ul style="list-style-type: none"> • I am going to finish (if there is time) by showing the students the PHET Ohm's law simulation https://phet.colorado.edu/sims/html/ohms-law/latest/ohms-law_en.html This will show the students the full relationship between the variables and how if voltage increases then resistance increases etc. 	<ul style="list-style-type: none"> • Watch the PHET Ohm's law simulation 	<p>5 mins</p>

Organizational Strategies:

- Everything is printed and ready to go
- Have my copy of notes filled out with side comments that I want to mention written on there
- Prepare questions to ask the students and prepare for some questions they may ask
- Lab is set up and organized into sections with the materials already at each station
- Groups are premade
- Have links and websites already open and ready to go

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
- 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
- Allow the students time to play with the circuits to ensure the lab is fun for them

Extensions:

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Reflections (if necessary, continue on separate sheet):

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