Name
TA

Science 9
2022-2023

Learning Guide 8: Ohm's Law and Series Circuits

BIG IDEA: Electricity is the flow of electrons.

Fundamental Knowledge (I know:)

- ☐ Circuits must be complete for electrons to flow and can explain why.
- ☐ How to use Ohm's Law to calculate values (Voltage, Current, Resistance) in series circuits.
- ☐ How to draw simple circuit diagrams using appropriate conventions and symbols
- ☐ How voltage, resistance, and current apply to the flow of electric charge
- ☐ How to apply Ohm's Law to describe the relationship between voltage, current and resistance

Curricular Competencies (I can:)

	Proficiency Scale Teacher and Student self assessment (Circle one)	**Evidence (How do you know?)**
I can: **Process and Analyze Data:** -Analyze and interpret circuit diagrams and models for series circuits. - Construct circuits digitally or with lab equipment. -Measure and calculate V, I, and R using Ohm's Law and appropriate units.	**Emerging (EMG)** Initial Understanding **Developing (DEV)** Partial/Near Complete Understanding **Proficient (PRF)** Complete Understanding **Extending (EXT)** Sophisticated Understanding	
I can; **Analyse Cause and Effect Relationships:** Use Ohm's law to give a detailed relationship between V, I and R in a series circuit. Summarize what happens to current in a series circuit with changes in voltage and resistance.	**Emerging (EMG)** Initial Understanding **Developing (DEV)** Partial/Near Complete Understanding **Proficient (PRF)** Complete Understanding **Extending (EXT)** Sophisticated Understanding	

Instructions To help guide your learning, make your way through the activities in Option 1, Option 2, or Option 3. You may "mix and match" between the different Option columns.

TOPIC	OPTION 1	OPTION 2	OPTION 3
Current and Resistance	A. Using textbook and internet resources as references, complete the "**Current and Resistance**" questions worksheet.	A and B. Using textbook and internet resources as references, create a guide to understanding what Voltage, Current, and Resistance are, as well as how each concept is related by Ohm's Law. The guide must include: • Explanations of what current and resistance are • How to measure current and resistance (with units!) • What resistance does to the energy in a circuit • What happens to current when voltage and resistance change • Conventional current vs. Electron flow • The symbols used to create circuit diagrams • How to use the math of Ohm's law to calculate one property, when the other two are known Example: 5V and 200 mA gives what resistance for the circuit? A great website to learn about the relationships between each term is: Ohm's Law (colorado.edu)	**Choose your own adventure!** Pick up a planning sheet from the Science Kiosk. Create a plan! Make sure you read through the first page of this LG, as you will need to design ways to learn/practice and show your understanding of the topic(s) and skill(s) (competencies.) You will need to have a teacher approve your plan before beginning the LG.
Ohm's Law Calculations	B. Using the mathematical relationship described by Ohm's Law, complete the "**Ohm's Law Calculations**" worksheet.		
Series Circuits	D. Use the text book or internet resources to learn about how Voltage, Current, and Resistance behave in a series circuit. A great YouTube video is titled "Ohms law series circuit" by The Electric Academy. Ohms law series circuit - YouTube Complete the "**Series circuit puzzles"** worksheet.	C. Go to Circuit Construction Kit: DC (colorado.edu). Once there, construct circuits that demonstrate the following concepts: • The voltage drops across resistors adds up to the voltage provided by the battery • The current remains the same throughout a series circuit • The resistances of the resistors add up to the total resistance • Increasing the voltage or resistance affects the current and can be described with Ohm's Law. Take screen shots of the circuits and assemble them on a word document. Label each circuit with what you are attempting to illustrate.	
Self Assessment	Reflect on the Fundamental Knowledge and Curricular Competencies. Use the rubric and make goals to improve for your next learning guide.		
Interview or Quiz	See you teacher for an interview or to have a quiz slip signed for the test center. Bring your work and staple it to your quiz when complete.		

Resources can be found at www.THSSscience.com or the Science Kiosk
*User: **THSS***
*Password: **science***