SECOND TERM
WEEKLY LESSON NOTES
WEEK 6

Week Ending: 12-05-2023	**DAY:**	**Subject:** Science	
Duration: 100mins		**Strand:** Forces & Energy	
Class: B8	**Class Size:**	**Sub Strand:** Electricity & Electronics	
Content Standard: B8.4.2.1 Demonstrate knowledge of electricity transmission	**Indicator:** B8.4.2.1.1 Explain how electricity transmission occurs.		**Lesson:** 1 of 2
Performance Indicator: Learners can explain how electricity transmission occurs.		**Core Competencies:** DL 5.3: CI 6.8: DL 5.1: CI 6.6:	
References: Science Curriculum Pg. 72			

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Share learning indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Ask learners to tell some of the use and importance of electricity in their homes. Brainstorm learners for the meaning of electricity transmission. *Electricity transmission is the process of delivering generated electrical energy over long distances to distribution grids that are closer to consumers*. Show pictures depicting electricity generation in the country. Learners talk about how electricity is generated in Ghana. Guide learners to identify different stages of electricity transmission. *1. Power Generation: Electricity is generated in power plants using various energy sources such as coal, natural gas, nuclear, hydropower, wind, solar, etc.* *2. Step-Up Transformers: The voltage of electricity generated in power plants is typically low, so it is stepped up to high voltage levels (often several hundred kilovolts) using transformers to reduce energy losses during transmission.* *3. High-Voltage Transmission: The high-voltage electricity is then transmitted over long distances (often hundreds of miles) on high-voltage power lines supported by tall towers or poles. The transmission lines are typically made of aluminum or copper conductors.* *4. Substations: Along the transmission route, the high-voltage electricity is routed through substations where it is stepped down to lower voltage levels for distribution to local networks.*	Pictures and charts

	5. Step-Down Transformers: The electricity is then stepped down to even lower voltage levels (typically tens of kilovolts) using transformers for distribution to end-users. *6. Distribution Networks: The lower voltage electricity is then distributed through local networks of power lines, poles, and transformers to homes, businesses, and other end-users.* *7. End-Use: Finally, the electricity is consumed by end-users for various purposes such as lighting, heating, cooling, and powering electronic devices.* Learners research and draw a flow chart to show the stages of electricity transmission from the point of generation to the point of consumption. <u>Assessment</u> 1. What is the purpose of the step-up transformers in the electricity transmission process? 2. Why is electricity transmitted at high voltage levels? 3. What are substations, and what is their role in the electricity transmission process? 4. How is electricity distributed to homes and businesses after it is transmitted over long distances?	
PHASE 3: **REFLECTION**	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

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Content Standard: B8.4.2.2 Demonstrate understanding of the functions of capacitors in relation to LEDs, Diodes and resistors in electronic circuits	**Indicator:** B8.4.2.2.1 Demonstrate the charging and discharging action of a capacitor in a DC electronic circuit	**Lesson:** 2 of 2
Performance Indicator: Learners can demonstrate the charging and discharging action of a capacitor in a DC electronic circuit	**Core Competencies:** DL 5.3: CI 6.8: DL 5.1: CI 6.6:	
References: Science Curriculum Pg. 72		

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Share learning indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Learners in their groups research information about capacitors in electronic circuits and explain their functions when connected with direct current (DC). *A capacitor is an electronic component that stores electrical energy in an electric field between two conductive plates separated by a dielectric material. It is also known as a "capacitance" or "condenser."* When a voltage is applied to the capacitor, electrical charge accumulates on the plates, causing a potential difference between them. The amount of charge that can be stored in the capacitor depends on its capacitance, which is measured in farads (F). <u>Uses of Capacitors in electronic circuits</u>: *1. Energy storage: Capacitors can store electrical energy and release it quickly when needed, making them useful for applications such as flash photography or in electrical circuits that require a burst of energy.* *2. Filtering: Capacitors can be used to filter out unwanted noise or interference in electronic circuits by acting as a high-pass or low-pass filter.* *3. Coupling: Capacitors can be used to connect two circuits together while blocking direct current (DC) between them. This is known as "coupling" and is commonly used in audio amplifiers.* *4. Timing: Capacitors can be used in conjunction with resistors to create timing circuits, such as those used in oscillators or pulse generators.* *5. Tuning: Capacitors can be used in tuning circuits, such as in radio receivers or in frequency filters. By changing the capacitance, the resonant frequency of the circuit can be adjusted.*	Pictures and charts

	Guide learners to describe the charging and discharging actions of a capacitor and explain the role of LEDs, diodes and resistors in an electronic circuit. *The charging and discharging actions of a capacitor involve the buildup and release of electrical charge across the capacitor's plates. When a voltage source is connected across a capacitor, the capacitor charges up to the voltage of the source. As the capacitor charges, the voltage across it increases and the current flowing into the capacitor decreases. Once the capacitor is fully charged, the current stops flowing, and the voltage across the capacitor is equal to the voltage of the voltage source.* In an electronic circuit, LEDs (light-emitting diodes), diodes, and resistors can play various roles depending on the circuit design. • *LEDs are semiconductors that emit light when a current flows through them. In a circuit, an LED can be connected in series with a resistor to limit the current flowing through it and protect it from burning out. LEDs are commonly used as indicators or in lighting applications.* • *Diodes are electronic components that allow current to flow in only one direction. They can be used to rectify AC (alternating current) signals into DC (direct current) or to protect circuits from voltage spikes.* • *Resistors are components that resist the flow of electrical current and are used to control the amount of current flowing in a circuit. They can be used to limit current flow to LEDs or other components, to bias transistors, or to create voltage dividers.* <u>Assessment</u> 1. What is a capacitor, and what is its role in an electronic circuit? 2. How does a capacitor charge and discharge, and what happens to the voltage and current across a capacitor during these processes? 3. What is the function of a resistor in an electronic circuit, and how does it control the flow of electrical current? 4. Describe the role of LEDs and diodes in electronic circuits and give examples of their applications.	
PHASE 3: **REFLECTION**	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	