**EMERALD ROYAL INTERNATIONAL SCHOOL, MPAPE ABUJA**

**LESSON PLAN AND NOTE FOR WEEK 5 ENDING FRIDAY: 10th FEBRUARY, 2023**

**TERM:** 1st

**WEEK:** 5th

**DATE** : 6th – 10th February 2023

**SUBJECT:** Physics

**CLASS :** SS 2

**TOPIC:**  **Electric fields**

**SUB - TOPIC:** 1. **Electric current, potential difference, Electromotive force**

1. **Resistance, types and calculations**
2. **Sources of electric current**

**PERIOD:** 3rd

**TIME:** 9: 30 - 10:10am

**DURATION:** 40 minutes

**AVERAGE AGE:** 16 years

**SEX:** Mixed

**SPECIFIC OBJECTIVES:** By the end of the lesson, students should:

**RATIONALE:** To enables students understand the concept electric fields

**PREVIOUS KNOWLEDGE:** Students have being taught matter

**INSTRUCTIONAL RESOURCES:** Charts showing fields, bar magnets and properties of fields

**REFERENCE:** Senior Secondary School Physics by P.N. Okeke et al, New School Physics for Senior Secondary Schools by Anyakoha, M.W, Comprehensive Certificate Physics by Olumuyiwa Awe and Okunola, O.O, Science Teachers Association of Nigeria Physics for Senior Secondary School, Book 1. New Edition and Melrose Physics for Senior Secondary School, Book 1 by Akano, O and Onanuga, O.O.

**LESSON DEVELOPMENT**

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| **STEPS** | **TEACHER’S ACTIVITIES** | **STUDENTS’ACTIVITIES** | **LEARNING POINTS** |  |
| **INTRODUCTION** | The teacher introduces the lesson by asking the following questions::   1. What is electric current? 2. Define resistance 3. What are the sources of electric current? | The students respond based on their previous knowledge | To arouse the students interest toward the lesion. |  |
| **STEP 1** | The teacher Defines electric current, potential difference and electromotive force | The students pay attention. | To keep them focus. |  |
| **STEP 2** | The teacher explains Non-crystalline or Amorphous Substances | The students explain the difference between Non-crystalline or Amorphous Substances | To encourage critical thinking |  |
| **STEP 3** | The teacher defines and explains the States of matter | The students participate in the class discussion | To encourage students retentiveness |  |
| **BOARD SUMMARY** | **Sub- Topic1: Electric current, potential difference, Electromotive force**  **Electric current (l):** is defined as the ***time rate*** ***of flow of electric charge*** along a conductor.  Q is the quantity of charge measured in Coulomb, ‘t’ is the time in second . I is the current in Ampere(A).There are submultiples of Ampere  1mA = 10-3A  1μA = 10-6A  Ammeter is an instrument used for measuring current. The electric symbol for ammeter is    Milliameter measure smaller current.  Galvanometer are used to detect very small current.  **Electric circuit**  An *electric circuit is the path provided for the flow of electric current.*  An electric circuit is a system that consists of the source of electricity, the key or switch and the connecting wires, ammeter to measure the current, voltmeter to measure the potential difference, Resistor or load and a rheostat to adjust the flow of current.      **CIRCUIT DIAGRAM**  Ammeter  Resistor  Battery/cell  key  **V**    Rheostat  **A**  **Closed Circuit:** It is a circuit in which there is no gap (key closed) along the conducting path.  **Load**  **Key closed**    cell  **Open circuit:** It is a circuit in which there is a gap (key open) along the conducting path.    **Load**  **key**    Dry cell  **Short Circuit:** A short circuit is a closed circuit without a load. The terminals of the cell are connected together.      **Key closed**    cell  **Potential difference ( V):** The potential difference between any two points in an electric field is defined as the ***work done in moving a positive charge of 1 coulomb from one point in the electric field to another.*** Potential difference is measured in volts.  Voltmeter is used to measure potential difference.    **Electromotive force**: Electromotive force is defined as the total work done in driving one coulomb of electricity round a closed circuit or the total energy per coulomb obtained from a cell or battery.  Electromotive force can also be defined as the potential difference across the terminal of a cell when it not delivering current to an external circuit or the potential difference across the terminal of a cell when it is in an open circuit.  Resistance: This can be defined as the opposition to the flow of charges (electrons) or current. Its S.I unit is Ohm. It is measured using Ohmmeter.  Types of Resistors:  i. Fixed/standard resistor: They have fixed resistance. The electrical symbol is  OR  ii. Variable resistor: They are those resistors whose resistance can be varied such as Resistance box and Rheostat. The electrical symbols are  **EVALUATION:**  1. Define the following terms   1. Resistor 2. Electromotive force 3. Current. 4. Lines of force 5. Potential difference   **Sub- Topic 2: SOURCES OF ELECTRIC CURRENT**  Electric current can be generated from the following sources.  1. Chemical energy: Electrical cells store chemical energy. There are two types of electrical cell. The primary cell and the secondary cell. The primary cell cannot be recharged while the secondary cell can be recharged.  2. Heat Energy: Electricity can be generated by thermoelectric effect using a thermocouple, which consists of two different metallic wires joined and dipped in hot water while the other end is connected to a sensitive galvanometer.  3. Mechanical Energy: Current can be obtained from the generator. The generator converts mechanical energy to electrical energy by the principle of electromagnetic induction.  4. Solar Energy: Electricity can be generated from solar energy using the solar cell. In the solar cell solar energy is converted to electrical energy. | The students copy notes into their exercise book | For future reference. |  |
| **Evaluation** | The teacher evaluates the students with the following questions:   1. Define electric current, potential difference and electromotive force 2. Define resistance and types 3. State the sources of electric current | The students attempt the questions. | To ascertain their level of understanding. |  |
| **Conclusion** | The teacher concludes the lesson by making corrections where necessary and go through their notes. | The students copy the note on the board. | For future use. |  |
| **Assignment** | The teacher evaluates the students as follows:   1. **Explain at least three sources of generating electricity.**   **WEEKEND ASSIGNMENT**  1. Which of the following is not part of a circuit?  A. cell B. Key C. load D. film  2. Which of the following types of energy is stored by a dry Leclanche cell ?  A. Chemical energy B. Nuclear energy  C. Solar energy D. Heat energy.  3. Electrical resistance is the property of a conductor that enables electrical energy to be converted to  A. Heat energy B. Chemical energy C. Mechanical energy D. Solar energy  4. Which of the following statements is not correct about an electric field?  A. It is a force field. B. It is a scalar quantity  C. Its strength may be expressed in volts per meter.  D. Its intensity at a point obeys the inverse square law.  5. In a domestic circuit, electrical appliances and lamps are arranged in parallel across the  mains so as to enable the  A. same current to flow through the electrical appliances and the lamps.  B. maximum energy to be consumed at least cost.  C. same fuse to be used for the electrical appliances and the lamps.  D. voltage across the appliances not to be affected when the lamps are switched on and  off.  1. (a) Define electric field.  (b) Draw the electric field pattern around two unlike charges.  2. (a) Define the electromotive force and terminal potential difference of a battery.  (b) Explain why the electromotive force of a cell is not always the same as the  potential difference between its terminals. | The students copy assignment solve at home and submit for marking endorsement. | To encourage further studying at home. |  |



14/3/2023

Principal Head Instructor