**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 1

**TOPIC:** Description and properties of fields

**SUB - TOPIC:** i. Concept of fields

ii. Types of fields

**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:

1. Explain the concept of fields
2. State the types of field

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

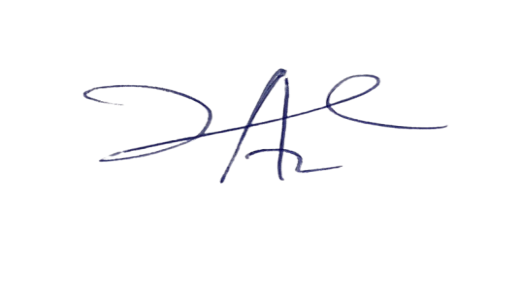
**PREVIOUS KNOWLEDGE:** Students have being taught fields

**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**

|  |  |  |  |
| --- | --- | --- | --- |
| **STEPS** | **TEACHER’S ACTIVITIES** | **STUDENTS’ACTIVITIES** | **LEARNING POINTS** |
| **INTRODUCTION** | The teacher introduces the lesson by asking the following questions::   1. What are fields? 2. State the types of fields 3. State the properties of fields | The students respond based on their previous knowledge | To arouse the students interest toward the lesion. |
| **STEP 1** | The teacher explain and define fields | The students pay attention. | To keep them focus. |
| **STEP 2** | The teacher explain the types of fields | The students state the effects of heat | To encourage critical thinking |
| **STEP 3** | The teacher list the properties of fields | The students participate in the class discussion | To encourage students retentiveness |
| **BOARD SUMMARY** | **Sub-Topic 1: CONCEPTS OF FIELDS**  A field is a region under the influence of some physical agencies such as gravitation, magnetism and electricity.  There are two types of field:   * Vector field * Scalar field.   A vector field is that field which is usually represented by lines of force; while a scalar field is that field that is not represented by lines of force.  Examples of vector fields include gravitational field, magnetic field and electric field.  Examples of scalar fields include regions with distribution of temperature, density, etc.  **Sub-Topic 2: TYPES OF FIELDS**  **i) Gravitational field**  Gravitational field is a region of space or a force field surrounding a body that has the property of mass. In this region, any object that has mass will experience a force of attraction, called gravitational force.  Gravitational force is responsible for the fact that any object thrown up must definitely fall back. This force of gravity pulls every object towards the centre of the earth. That is to say, gravitational force causes a body which is not in contact with the earth to fall to the ground. This therefore means that the earth exerts an attractive force on every object either on it or near it.  Similarly, two objects of different masses exert equal and opposite forces of attraction on each other.  The radial field near a planet (e.g, earth) is shown below:  planet    **ii) Magnetic Field**  Magnetic field is a region around a magnet where it exerts force on other magnets. It is also a region where magnetic force is felt.  The patterns of the magnetic lines of force are shown below:  **MAGNETIC FIELD PATTERN**  1. Field of a bar magnet:  S  N  2. Attraction between unlike poles:  S  N  3. Repulsion between like poles:  N  N  NP  S  S  NP  NP means Neutral Point. In this point, no magnetic influence is felt.  **iii) Electric Field**  An electric field is a region around an electric charge where it exerts force on other charges. It is a field where an electric influence is felt.  The patterns of the electric lines of force are shown below:  1. Isolated positive and negative charge field lines:  **+**  **-**  2. Attraction between unlike charges:  **+**  **-**  3. Repulsion between like charges:  **+**  **+**  **NP**  **-**  **-**  **NP**  NP means Neutral Point. In this point, no electrical influence is felt.  **Sub-Topic 2:** **PROPERTIES OF A FORCE FIELD.**  **i) Gravitational Field**   * The lines of force are directed towards the centre of the planet; hence, it is a radial field. * The gravitational force field (field strength ) ‘g’ at a point is the force per unit mass placed at that point. * Any force acting on a body falling towards the centre of the earth is given by * Gravitational field is a vector quantity.   **ii) Magnetic Field**   * Direction: When a magnet is freely suspended, it comes to rest in the South-North direction of the earth. * Attraction: A magnet has the ability to attract magnetic materials e.g, steel, iron, etc. * Force: A magnet exerts force on other magnets in such a manner that like poles repel and unlike poles attract. * The inseparable nature of poles on the magnetic dipoles: If a magnet is broken into small pieces, however small it may be, it will still have a North and South Poles. The smallest bit of a magnet is a dipole. * Magnetic lines of force originate from the North pole and terminate at the South pole.   **iii) Electric Field**   * Electric lines of force originate from a positive charge and terminate in a negative charge. * Electric lines of force never cross each other. * They repel each other side ways. * They are in a state of tension which tends to shorten them. * The electric field at a point is defined as the force per unit charge placed at that point. | The students copy notes into their exercise book | For future reference. |
| **Evaluation** | The teacher evaluates the students with the following questions:   1. Define fields 2. State the types of fields 3. State the properties of fields | 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. What is a field?  2. State the two types of field.  3. List the examples of vector field.  4. What is neutral point?  5. Discuss the properties of the magnetic flux.  6. Define the electric field strength.  7. Itemize the three vector fields. | The students copy assignment solve at home and submit for marking endorsement. | To encourage further studying at home. |



7/3/2023

Principal Head Instructor