**THE PRESIDENT’S OFFICE-**

**REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT**

S**CHEME OF WORK**

TEACHER’S NAME:

SCHOOL’S NAME:

CLASS/STREAM: **FORM THREE**

SUBJECT: **PHYSICS**

YEAR: **2024**

TERM: **1 & 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COMPETENCE** | **GENERAL OBJECTIVE** | **MONTH****MON** | **WEEK****WK** | **MAIN TOPIC** | **SUB TOPIC** | **PERIOD** | **TEACHERS ACTIVITIES** | **LEARNING ACTIVITIES**  | **TEACHING AIDS** | **REFERENCE** | **ASSESMENT**  | **REMARKS** |
| Applying rules of friction in daily life  | Realize the importance of infraction in daily life  | **J****A****N****U****A****R****Y** | **2** | **APPLICATIONS OF VECTORS** | **Scalar and Vector quantities**  | 4 | To Guide students to classify the physical quantities into scalars and vectors  | To distinguish physical quantities into scalar and vectors  | Graph paper, ruler, mathematical set.  | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Are students able to classify physical quantities in scalar and vectors |  |
| To demonstrate on adding vectors by graphical method | To add displacement, velocities and forces by graphical method. |
| To Guide students to find the resultant and direction of a vector by using triangle and parallelogram laws  | To find the resultant and direction of vector  |
| Lead students to state triangle and parallelogram laws of forces  | To state triangle and parallelogram laws. |
|  |  | **J****A****N****U****A****R****Y** | **3****4** |  | **Relative motion**  | 4 | To Lead students to explain the concept of relative motion  | Students to discuss the relative velocity of two objects moving in the same direction and in the opposite directions | * Graph paper.
* Ruler
* Mathematic set
 |  | Are students able to explain relative motion/ |  |
| To Guide students to find the relative velocities of two bodies by drawing or calculation  | Students to find the relative velocities of two bodies by drawing or calculations. |
| To Lead students to discuss the applications of relative motion in daily life.  | Students to discuss the applications of relative motion in daily life |
|  |  | **FEBRUARY** | **1** |  | **Resolution of Vectors** | 4 | To Guide students to explain the concept of resolution of vector  | Student to explain the concept of components of a vector.  | Charts of moving boat or air plane |  | Are students able to explain about the resolution of vectors? |  |
| To Help them to resolve a vector into two mutually perpendicular directions. | Students to resolve a vector into two mutual perpendicular directions.  |
| To Assist students to solve problems of forces and velocities by resolving  | Students to solve problems of forces and velocities by resolving  |
|  |  | **FEBRUARY** | 2 | **FRICTION**  | **Concept of friction**  | 2 | To assist students to explain the concept of friction.  | To explain the concept of friction  | Rollers, Grease, ball-bearing |  | Are students able to describe friction? |  |
| To Guide students to discuss the advantages and disadvantages of friction in daily life | To mention the disadvantages of friction such as wearing and tearing of clothes and tires  |
| To Group students and guide them to discuss the way of reducing friction.  | To discuss the methods of reducing friction like rollers, ball bearings and lubricants |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | 2 | **FRICTION**  | **Type of Friction**  | 2 | To Lead the students to discuss the types of friction forces  | Students to discuss the types of friction | - Block of wood - Rough surface - Spring balance - Pulley - String |  **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Are students able to identify types of friction? |  |
| To Guide them to determine the limiting friction by using a black of wood.  | Students to determine the limiting friction using a block of wood. |
|  | 3 |  | **Laws of friction**  | 2 | To Guide students to state laws of friction  | Students to listen and take notes. | Students to listen, take notes.And carryout an experiment to determine the coefficient of static friction.  |  |
| To Guide students to define the coefficient of static and dynamic friction.  | Students to carryout an experiment to determine the coefficient of static friction.  |
| To Guide students to solve problems on friction  | Students to solve questions as class work and home work on friction. |
|  |  |  | 3 |  **LIGHT**  | **Reflection of light from curved mirrors.**  | 2 | To Display concave and convex mirrors to students. Ask them to describe the features of concave and convex mirrors and distinguish them | To describe, while in groups the features of concave and convex mirrors.  | Concave and convex mirrors. * Spoons
 | Principal of physics by Nelkon 8th Ed Pg. 268-269 | Are students able to describe the application of law of friction? |  |
| To Guide students to describe principal axis, pole, focus, and radius of curvature as applied to mirrors. | To define the principal axis, focus, pole, radius of curvature and distinguish them. |
| Using the knowledge of light in the constructions of optical instruments  | Understand principles of construction of optical instruments | FEBRUARY | 4 | **LIGHT**  | **Refraction of light**  | 13 | Guiding students to brainstorm on the concept of refraction of light | students to brainstorm on the concept of refraction of light | -Graph -paper * Curved mirrors
* Plain paper
* Object
* Screen
* Optical pins
* Torch
 |  | Are students able to describe principles of construction of optical instruments? |  |
| Guiding students to use a ray box and rectangular glass block to show refraction of light at a boundary. | students to use a ray box and rectangular glass block to show refraction of light at a boundary. |
| To demonstrate the angles of incidence and refraction | Students to measure the angle of incidence and refraction |
| To lead students to discuss the law of refraction | students to discuss the law of refraction |
| Guiding students perform experiment to determine the refractive index of material | students carryout experiment to determine the refractive index of material |
| To brainstorm students on definition of critical angle and total internal reflection of light | students to brainstorm on definition of critical angle and total internal reflection of light |
| To organize a study field trip for observing the occurrence of mirage  | On study tour students to observing the occurrence of mirage |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | MARCH | 1 | **LIGHT** | **Refraction of light by Rectangular Prism** | 2 | To Lead students of define refraction of light using a stick immersed in a glass of water. | To define the refraction of light. | - Rectangular  Glass block -Optical pins -Protractor -Drawing board.-Ruler.-White paper  | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Are students able to describe the refraction of light? |  |
| To guide students to trace the passage of light through a rectangular prism | to trace the passage of light through a rectangular prism |
| **Refraction of light by Triangular Prism** | 2 | To assist students through question and answers, to trace the passage of light through triangular prism | students through question and answers, to trace the passage of light through triangular prism |
| Guiding students to demonstrate the dispersion of white light using triangular prism | students to demonstrate the dispersion of white light using triangular prism |
| Guiding students to demonstrate about the angle of deviation and minimum deviation | students to determine the angle of deviation and minimum deviation |
|  |  | **MARCH** | 2 | LIGHT  | **Colours of Light**  | 22 | Guiding students to determine angle of deviation and minimum deviation. | Students to do the practical to determine angle of minimum deviation  | * Triangular glass block.
* Optical pins.
* White paper

Coloured objects Coloured filters White objects  |  | Are Students in group able to constract a simple prism binocular.? |  |
| To explain the components of white light. | Students to name the components of white light  |
| To discuss on the methods of recombination of colours of white light. | Students to listen and take notes  |
| To demonstrate the appearance of coloured objects in white light.  | Students to observe the coloured object through white light  |
| Guiding student to identity primary, secondary and complementary colour of light.  | To identify primary, secondary and complementary colours.  | -Blue, Green and Red filters.-White screen. | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | students able to describe the colours of light? |  |
| Guiding students to discuss with students about additive and subtractive colour mixing  | To describe the additive and subtractive colour mixing  |
| MARCH | 3 |  | **Refraction of light by lens** | 2 | Guiding students to display the concave and convex lenses to students.  | To identify the concave and convex lenses.  | -Concave and convex mirrors | students able to determine the focal length? |  |
| To explain the terms focal length, principle focus, principle axis and optical centre as applied to lenses.  | To listen and take notes  |
| 2 | To Lead students to determine the focal length of a convex lens. | Students to determine the focal length of a convex mirror  | Convex lens Meter rule.- Candle - Match box  |  |
| To lead students to discuss using ray diagrams how to locate the image formation by a lens.  | students to discuss using ray diagrams how to locate the image formation by a lens.  |
| Guiding the students to determine the position, size and nature of the image formed by using lens formula 1 = 1 + 1ƒ ųű* Do more calculations as example
 | * To use the thin lens formula to calculate the image position sixe and state the nature of the image formed
 |
| MARCH | 4 | **OPTICAL INSTRUMENTS**  | **Simple microscope** | 2 | Guiding students to describe the structure and mode of action of a simple microscope  | To describe and explain how the device works.  | Chart/ diagram of simple microscope | A.F. ABBOTT Pg. 269-Pg 272 M. Nelkcon 8th Ed. Pg 313-Pg 325 | are students able to describe the structure and mode of action of a simple microscope? |  |
| Guiding students to construct a simple microscope | students to construct a simple microscope |
|  |  |  | 4 | **Compound microscope**  | 2 | Guiding students to discuss the structure and mode of action of a compound microscope.  | Using ray diagram students to show image formation and magnification of a compound microscope. | * Chart of compound microscope
* Lenses screen, objects.
 | Are Students in a group of 5-6 able to construct a simple compound microscope? |  |
| To help students to highlight the common uses of a compound microscope in daily life.  | Students to discuss the uses of compound microscope in daily life.  |
|  |  |  | 4 | **OPTICAL INSTRUMENTS** | **Astronomical telescope**  | 2 | Guide students to describe the structure and mode of action of an astronomical telescope.  | Students to describe the structure and mode of action of a telescope | -Lenses.- Chart of an astronomical telescope  |  | Are students able to construct a simple telescope. ? |  |
| To Highlight the uses of an astronomical telescope.  | Students to list down the application of a telescope.  |
|  |  | **APRIL** | 1 |  | **Projection lantern**  | 2 | To Lead students to discuss on the structure and mode of action of a projection lantern-Guiding students to discuss, by demonstration, the uses of a projection lantern  | Students to participate in the discuss To observe the function of the machine To take notes  | -Projection lantern - Slides -Chart of projection lantern  |  | Are Students a group of 5-6 able to construct a simple projection lantern  |  |
| **MIDTERM TEST** |
| **MIDTERM BREAK 31TH MARCH – 08TH APRIL 2024** |
|  |  | APRIL | 2 |  | **Lens camera**  | 2 | -To Lead students to discuss on the structure and mode of action of a lens camera-Ask students to mention uses of a camera | -To participate in the discuss -To list down the daily life practical application of the lens camera  | * Lens camera
* Chart of lens
* Camera
 |  | Students to explain the application of lens ca |  |
|  |  |  | **2** | **The human eye** | 2 | To describe the structure and mode of action of a human eye.Guiding students to identify the defects of the human eye and how they can be connected Asking students to write down the similarities of human eye and lens camera as a home work.To do calculations on optical instruments. | -To list down the structure of a human eye.-To identify the defects of the eye and the Connections.- To write down the similarities of the eye and the eye and the lens camera. - To do calculations given by the teacher.  | * Model of human eye.
* Optical diagram of lens camera
 | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Are student able to describe the structure of human eye? |  |
|  |  |  | **3** | **THERMAL EXPANSION** | **Thermal energy**  |  2 | To Lead students to brainstorm on the concept of heat. | Students to explain the concept of heat. | .Ball and ring Source of heart  | Are students able to describe thermal expansion of different materials? |  |  |
| Highlight the sources of thermal energy in everyday life. | Student to name some source of heat they know. |
| Guide students of differentiate between heat and temperature.  | Students to differentiate heat from temperature.  |
| **3** |  | **Thermal expansion of solids** | 2 | Lead students to demonstrate the expansion of solids using ball and ring experiment.  | To perform various activities to demonstrate expansion and construction of solids | Solid substances,chart | Students to explain expansion and construction of solids |  |
| Guide students to discuss in groups the expansion and contraction of solids interns of the kinetic theory of matter. | students to discuss in groups the expansion and contraction of solids interns of the kinetic theory of matter |
| Lead students to develop the formula of linear expansion of solids  | To determine the coefficient of linear expansibility.To do calculations on the applications of the formula  |
| **MAY** | **1** |  | **Thermal expansion of liquid**  | 4 | Guiding students to explain the apparent expansion of a liquid | students to explain the apparent expansion of a liquid | .Ball and ring * Source of heart.
 | students to explain the apparent expansion of a liquid |  |
| To demonstrate the volume expansion of liquids (different) | Students to take note on the volume expansion of liquids (different) |  |  |
| To Lead students to define volume expansivity of liquid  | students to define volume expansivity of liquid  |
| To guide students on, how hear affect the density of liquids.  | students on, how hear affect the density of liquids. |
|  |  | **MAY****MAY** | **2** | **THERMAL ENERGY** | **Thermal expansion of Gases** | 4 | Guiding students to explain the concept of thermal expansion of gas. | students to explain the concept of thermal expansion of gas. | Reference book,Source of heat,Capillary tube with mercury,Ruler,Tripod stand,Graph paper,Gas jar | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Students to explain thermal expansion of gas, and determine the relationship between temperature, volume and gas. |  |
| Guiding students to carryout experiment to determine the relationship between volume and temperature of a fixed mass of air at constant pressure. | Students to perform experiment and draw a graph of volume against temperature of a fixed mass of air at constant pressure and to deduct the statement of **Charle’s law** |
| Guiding students to perform experiment to find out the relationship between volume and pressure of a fixed mass of gas at constant temperature | students to perform experiment to find out the relationship between volume and pressure of a fixed mass of gas at constant temperature and deduce the statement of **Boyle’s law** |
| Guiding students to carryout experiment to findout the relationship between pressure and temperature of affixed mass of gas at constant volume | students to carryout experiment to findout the relationship between pressure and temperature of affixed mass of gas at constant volume and deduce the statement of **pressure law** |
| Guiding students to drive general gas equation  | students to drive general gas equation |
|  | 2 | **TRANSFER OF THERMAL ENERGY**  | **Conduction**  | 4 | Guiding students to brainstorm the concept of heat transfer  | Students to explain the concept of heat transfer. | -Brass rods-Wood a bar-Foam insulation.-Thick carpet-Curtains.  | .  | Students to explain the convection of heat.  |  |
| To Lead students to identify good and bad conductors of heat.  | Students to identify good and bad conductors of heat. |
| To Help students to explain how heat losses due to conduction can be minimized. | Students to lest down the mans of minimizing heat lost in a conductor. |
| Guiding students to discuss with students the selective uses of good and bad conductors of heat in everyday life. | Students to describe the uses of good and bad conductors of heat. |
|  |  |  | 3 | **TRANSFER OF THERMAL ENERGY**  | **Convection**  | 4 | Guiding students to demonstrate convection currents in water using crystals of potassium permanganate.  | to follow the demonstration and describe their observation.  | -Smoke-Potassium permanganate -Water -Diagram of sea and land breezes  |  | students to explain the transfer of heat by convection |  |  |  |  |
| To Lead students to discuss heat transfer in liquids and gases using the kinetic theory of mater.  | Students to discuss the formation of sea and land breezes during day and night.  |
|  | **3** |  | **Radiations**  | 4 | Guiding students to brainstorm how heat from the sun reaches the earth’s surface  | Student to discuss on how heat from the sun reaches the earth’s surface. | -Thermometer-Concave reflector -Lens-Thermos flask  |  | students to explain the transfer of heat by radiation? |  |
| To Lead students to discuss on how thermal radiation can be detected  | Students to detect thermal radiation using lens and concave reflector. |
| Guiding students to demonstrate that black surfaces are good absorbers and emitters of radiant heat. | Students to expose two objects of black surface and white surface and observe which is a good absorbers and good emitters of radiant heat |  |  |
| **TERMINAL EXAMINATIONS** |
| **TERMINAL LEAVE 31TH MAY – 01TH JULY 2024** |
|  |  | **JULY** | 4 | **MEASUREMENT OF THERMAL ENERGY**  | **Heart Capacity**  | 4 | Guiding students to discuss with the students on the factors which determine heat quantity of a substance. | Students to name the factors which determine heat quantity of a substance.  | * Heat
* Thermometer
* Beaker
 | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Are students able to apply measurements to determine heat quantity of substance? |  |
| Guiding students to define the heat capacity ofsubstance.  | Students to define capacity of a substance. |
| To Highlight the concept of specific heat capacity of a substance.  | Students to find the S.I. Unit of heart capacity. |
| Guiding Students to do calculation on heat capacity and specific heat capacity of a substance | Students to do calculation on heat capacity and specific heat capacity of a substance  |
| **AUGUST** | **1** |  | **Change of State** | **4** | To Lead students to demonstrate the behavior of particles in a solid, liquid and gases | Students to explain the behavior of particles in a matter in terms of kinetic theory of gases | Naphthalene-thermometer-Test tube -Graph paper -ice -Salt-Water - Beaker  |  |  |  |
|  | Are students to demonstrate the behavior of particles in a solid, liquid and gases? |  |  |  |
|  |
| To Lead students to demonstrate the effect of the impurities of freezing point and boiling point of water.  | Students to find out the effect of impurities on the boiling and freezing point of substance.  |
|  |  | **AUGUST** | **2** |  |  |  | To Lead students to demonstrate the effect of pressure on the boiling point and freezing point of water. |  students to find the effect of pressure on boiling point and freezing point of liquids. | -Conical flask-Rubber band-Thermometer -Water -Ice block -Weight -Thin wire -Beaker | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | students to demonstrate the effect of pressure on the boiling point and freezing point of water |  |
| Guiding students to demonstrate the effect of phenomenon of regulation.  | students to sit in group to discuss the concept of regulation. |
| To Highlight the concept of boiling and evaporation in respect to the kinetic theory of matter  | students to sit in group to discuss the concept of boiling and evaporation in terms of kinetic theory of matter  |
| 4 | Guiding students to discuss in groups the concept of the specific latent heat of fusion and vaporization of substance and its S.I. Units. | Students to discuss the concept of the specific latent heat of fusion and vaporization. Students to find its S.I. Units. | -Beaker -Thermometer -Water  | students able to describe the specific latent heat of fusion and vaporization |  |
| To Lead students to discuss the heating of water into vapour and plot the temperature time graph to deduce the latent heat of vaporization.  | Students to plot the graph of temperature-time to deduce latent heat of vaporization. to use the cooling curve of naphthalene to deduce latent heat of fusion of a substance  |
|  |  |  | 3 | **VAPOUR****AND****HUMIDITY** | **Vapour** | 4 | To Lead students to discuss the concept of evaporation of liquids. | students to discuss the concept of evaporation of liquids. | -Chart of diagram of refrigerator -Refrigerator -Ether spirit -Conical flask | students able to describe the parts of refregirator |  |
| To Lead students to the factors affecting evaporation of liquid. | students to the factors affecting evaporation of liquid. |
| To help students to distinguish between saturated and unsaturated vapours.  | students to distinguish between saturated and unsaturated vapours.  |
| Guiding students to explain the effect of temperature on saturated vapour pressure (S.V.P) of a liquid. | students to explain the effect of temperature on saturated vapour pressure (S.V.P) of a liquid. |
|  | 44 |  | **Humidity**  | 22 | To guide students to explain the concept of humidity | students to explain the concept of humidity | Wet and dry bulb hygrometer.  |  | students to explain the concept of humidity |  |  |
| To explain the formation of dew | Students To explain the formation of dew |
| To Lead students in groups to determination of Relative Humidity of air using wet and dry bulb hydrometer. | To find R.H. from the dew point using Reginault’s hygrometer. |
| Guide students to discuss the effect of R.H. in everyday life.  | To discuss the effects of R.H. in everyday life.And take notes.  |
| **MIDTERM TEST** |  |
| **MIDTERM BREAK 30TH AUGOST – 16TH SEPTEMBER 2024** |  |
|  |  | **SEPTEMBER** | 4 | **CURRENT ELECTRICITY** | **Electromotive force(E.M.F) and Potential Difference (P.D)** | 4 | Guiding students to discuss the concept of emf and p.d. | Students to discuss the concept of emf and p.d. | Electric cell,Voltmeter,Switch,Resistance,Ammeter,Charts, | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | students to explain the EMF and P.D? |  |  |
| To Lead students to state the units of emf and p.d. | To take notes to state the unit of emf and p.d. |
| Guiding students to measure the emf and p.d across a conductor  | To measure emf and p.d. across a conductor. |
| To Lead students to connect and analyse simple electric circuits | To connect and analyse simple electric circuits  |
| **OCTOBER** | 1&2 |  | **Resistance to Electric Current** | 8 | To lead students discuss the concept of electric current in a conductor | students discuss the concept of electric current in a conductor | Students to explain the resistance to electric current |  |
| Guiding students to describe factors which determine the resistance | students to describe factors which determine the resistance |
| Leading students to identify the types of resisters | students to identify the types of resisters |
| Guiding students to identify the equivalent resistance of more than two resistors in series and parallel | students to identify the equivalent resistance of more than two resistors in series and parallel |
| Guiding students to connect and analyse a simple electric | students to connect and analyse a simple electric |
|  |  | **OCTOBER** | 3 |  | **Effects of electric current** | 4 | To guide students to discuss the mechanism of heating by electric current. | students to discuss the mechanism of heating by electric current | Electric cell,Voltmeter,Switch,Resistance,Ammeter,Charts, | **SCSU &MoEVT****(2012), Physics for secondary schools form 3, Uhuru media, Zanzibar** | Students to explain the mechanism of heating by electric current |  |
| To guide students demonstrate the conversion of electrical current to heat energy by using a heat element. | students demonstrate the conversion of electrical current to heat energy by using a heat element. |
| Guiding students to investigate the relationship between heat, time and resistance of a conductor. | students to investigate the relationship between heat, time and resistance of a conductor. |
| Guiding students to interpret the power rating of electrical appliance | students to interpret the power rating of electrical appliance |
|  |  |  | 4 |  | **Electrical installation** | 4 | Guiding students to explain the meaning of letter E, L, N eelectrical wiring regarding their colours | students to explain the meaning of letter E, L, N eelectrical wiring regarding their colours | Electric cell,Voltmeter,Switch,Resistance,Ammeter,Charts, | students to explain the meaning of letter E, L, N eelectrical wiring regarding their colours |  |
| Guiding students to describe the function of fuse and a circuit breaker | students to describe the function of fuse and a circuit breaker |
| Guiding students to perform wiring on a board and check and rectify electrical faults in domestic appliance | students to perform wiring on a board and check and rectify electrical faults in domestic appliance |
|  |  | **NOVEMBER** | **1****&****2** |  | **Cells**  | 8 | Guiding students mode of action of dry cell (leclanche) | students mode of action of dry cell (leclanche) | Electric cell,Voltmeter,Switch,Resistance,Ammeter,Charts, | Students to explain the mode, defects of a cell |  |
| Guiding students to determine voltage combination of cells in series and parallel | Guiding students to determine voltage combination of cells in series and parallel |
| Guiding students to identify cell defects | students to identify cell defects |
| Guiding students to describe the mode of action of lead-acid accumulator | students to describe the mode of action of lead-acid accumulator |
| Guiding students to explain the charging and discharging phenomenon of an accumulator and the use of cell and accumulators in daily life | students to explain the charging and discharging phenomenon of an accumulator and the use of cell and accumulators in daily life |
|  |  |  |  | **ANNUAL EXAM ANNUAL HOLIDAYS** |  |  |  |  |