MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

SCHEME OF WORK

Name of teacher: _____ Name of School: **.....**

Year: **2023** TERM: **1 & 2**

Class/Stream: **FORM 3Sci1 & Sci2** Subject: **PHYSICS**

COMPETENCE	GENERAL OBJECTIVE	MON	WK	MAIN TOPIC	SUB TOPIC	No. PRD	TEACHERS ACTIVITIES	PUPILS ACTIVITIES	TEACHING AIDS	REF. BOOKS	ASSESMENT
Applying rules of friction in daily life	Realize the importance of infraction in daily life	JANUARY	1	APPLICATIONS OF VECTORS	Scalar and Vector quantities	4	- Guide students to classify the physical quantities into scalars and vectors - To demonstrate on adding vectors by graphical method - Guide students to find the resultant and direction of a vector by using triangle and parallelogram laws - Lead students to state triangle and parallelogram laws of forces	- To distinguish physical quantities into scalar and vectors - To add displacement, velocities and forces by graphical method. - To find the resultant and direction of vector - To state triangle and parallelogram laws.	Graph paper, ruler, mathematical set.	A.F. Abbott Pg53-55P.of Physics by M. Nelkon 8th Ed. Pg.28-30. A.F Abbott Pg.58-61	
		JANUARY	2		Relative motion		- Lead students to explain the concept of relative motion - Guide students to find the relative velocities of two bodies by drawing or calculation - Lead students to discuss the applications of relative motion in daily life.	- Students to discuss the relative velocity of two objects moving in the same direction and in the opposite directions - Students to find the relative velocities of two bodies by drawing or calculations. - To discuss the applications of relative motion in daily life	- Graph paper. - Ruler - Mathematic set -do-		

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		JANUARY	3		Resolution of Vectors	2	- Guide students to explain the concept of resolution of vector - Help them to resolve a vector into two mutually perpendicular directions. - Assist students to solve problems of forces and velocities by resolving -	- Student to explain the concept of components of a vector. - To resolve a vector into two mutual perpendicular directions. - To solve problems of forces and velocities by resolving -	Charts of moving boat or air plane	A.F. Abbott Pg56-57Pg A.F Abbott Pg.58-61		
		FEBRUARY	4	FRICTION	Concept of friction	2	- To assist students to explain the concept of friction. - Guide students to discuss the advantages and disadvantages of friction in daily life - Group students and guide them to discuss the	- To explain the concept of friction - To mention the disadvantages of friction such as wearing and tearing of clothes and tires - To discuss the methods of reducing friction like rollers, ball	Rollers, Grease, ball-bearing	A.F Abbott 5th ED. Pg.17-12 -do-		

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							way of reducing friction.	bearings and lubricants				

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			FEBRUARY	5	FRICTION	Type of Friction Laws of friction	2	- Lead the students to discuss the types of friction forces - Guide them to determine the limiting friction by using a black of wood. - Guide students to stake laws of friction - Guide students to define the coefficient of static and dynamic friction.	- To discuss the types of friction - To determine the limiting friction using a block of wood. - To listen and take notes. - Students to carryout an experiment to determine the coefficient of static friction.	- Block of wood - Rough surface - Spring balance - Pulley - String			

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					FRICTION	Laws of friction	2	- Guide students to solve problems on friction	- To solve questions as class work and home work on friction.	-	-do-		
			F E B R U A R Y	6	LIGHT	Reflection of light from curved mirrors.	2	-Display concave and convex mirrors to students. Ask them to describe the features of concave and convex mirrors and distinguish them -Guide students to describe principal axis, pole, focus, and radius of curvature as applied to mirrors.	- To describe, while in groups the features of concave and convex mirrors. - To define the principal axis, focus, pole, radius of curvature and distinguish them.	- Concave and convex mirrors. - spoons	-do-	Principal of physics by Nelkon 8th Ed Pg. 268-269	

COMPETENCE	GENERAL OBJECTIVE	MON	WK	MAIN TOPIC	SUB TOPIC	No. PRD	TEACHERS ACTIVITIES	PUPILS ACTIVITIES	TEACHING AIDS	REF. BOOKS	PROJECT TWORK	REMARKS
Using the knowledge of light in the constructions of optical instruments	Understand principles of construction of optical instruments	F E B R U A R Y	7	LIGHT	Reflection of light from curved mirrors	4	- Guide students to locate images formed by a curved mirror. - Define the nature, position and size of image formed by curved mirror. - Lead students to carryout an experiment to determine the focal length of a concave mirror by non-parallax	- To listen and take notes. - To locate images formed by curved mirrors - To carryout an experiment to determine the focal length of a concave mirror	- Graph paper - Curved mirrors - Plain paper - Object - Screen - Optical pins - Torch	Principal of Physics by M. Nelkon Pg 271-273 A.F. Abbott Pg. 236-243		

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							method or illuminated object.					
		M A R C H	8	LIGHT	Mirror formula	6	- Guide student to compute the position, magnification of an image formed in a curved mirror using mirror formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ - Lead students to describe the daily life application of curved mirrors	- To do several calculation on the application of the mirror formula. - To list down the applications of curved mirrors in daily life.		A.F ABBOTT 5TH Ed Pg.244 -247 Principals of Physics by M. Nelkon 8th Ed. Pg 277-279		
			9/ 10	**10TH – 15TH MARCH - MIDTERM TEST** **16TH – 23RD MARCH - MIDTERM BREAK**								

COMPETENCE	GENERAL OBJECTIVE	MON	WK	MAIN TOPIC	SUB TOPIC	No. PRD	TEACHERS ACTIVITIES	PUPILS ACTIVITIES	TEACHING AIDS	REF. BOOKS	PROJECT TWORK	REMARKS
		M A R C	11	LIGHT	Refraction of light	4	-Lead students of define refraction of light using a stick immersed in a glass of water. - Demonstrate to students on finding the angle of incidents	- to define the refraction of light. -to use glass block and optical pins to find angle I and angel r.	- Rectangular Glass block -Optical pins -Protractor -Drawing board. -Ruler. -White paper	A.F ABBOTT 5th ED. Pg 248-Pg 256		

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		H			Laws of Refracti on of light.		and angle of refraction. - Lead students to state laws of refraction of light. -Help students to carryout an experiment to determine the refractive index of a material.	- to state laws of refraction of light -to perform the experiment to determine the refractive index.	- do-			
		MARCH/APRIL	12		Critical angle and total interna l reflecti on	2	-Lead students to define critical angle and total internal refraction -Help students to determine critical angle and total internal reflection using semicircular glass block. -Discuss with students on refraction through triangular prism. -Demonstrate dispersion of white light. -Discuss on angle of deviation.	-to define critical angle and total internal reflection -to perform an experiment to determine critical angle and total internal reflection -to listen and take notes -to use triangular glass block to disperse white light.	-Semicircular glass block -Optical pins -Plane paper -Triangular prism	-do- -do-		

COMPETENCE	GENERAL OBJECTIVE	MON	WK	MAIN TOPIC	SUB TOPIC	No. PRD	TEACHERS ACTIVITIES	PUPILS ACTIVITIES	TEACHING AIDS	REF. BOOKS	PROJECT TWORK	REMARS
		APRIL	13	LIGHT	Colo urs	2	- Guide students to determine angle of	- To do the practical to determine angle	- Triangular glass block. - Optical pins.	-do-	Students in group to cons tract a simple	

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					of Light		deviation and minimum deviation. - Explain the components of white light. - Discuss on the methods of recombination of colours of white light. - Demonstrate the appearance of coloured objects in white light.	of minimum deviation - To name the components of white light - To listen and take notes - To observe the coloured object through white light	- White paper Coloured objects Coloured filters White objects	Principle of Physics by M. Nelkon 8th Ed. Pg 328 –Pg 337	prism binocular.	
		APRIL H 22 TH – FEB 22 ND	14	LIGHT	LENSES	2 2	- Guide student to identity primary, secondary and complementary colour of light. - Discuss with students about additive and subtractive colour mixing - Display the concave and convex lenses to students. - Explain the terms focal length, principle focus, principle axis and optical centre as applied to lenses.	- To identify primary, secondary and complementary colours. - To describe the additive and subtractive colour mixing - To identify the concave and convex lenses. - To listen and take notes	-Blue, Green and Red filters. -White screen. -Concave and convex mirrors	-do- A.F. ABBOTT Pg. 261-Pg268		

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APRIL APRIL 22TH – FEB 22ND	15		Lenses	4	- Lead students to determine the focal length of a convex lens. - Discuss using ray diagrams how to locate the image formation by a lens. Guide the students to determine the position, sixe and nature of the image formed by using lens formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ - Do more calculations as example	- To determine the focal length of a convex mirror - To follow discussion - To use the thin lens formula to calculate the image position sixe and state the nature of the image formed	Convex lens Meter rule.	-do-		

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	16	OPTICAL INSTRUMENTS	Lens Simple microscope	2 2	- Lead students to place a small object between the optical centre and F and a convex the image. - To solve more problems as an application of a lens formula. - Guide students to describe the structure and mode of action of a simple microscope	- To make observations on magnification of an image. - To do calculation as application of the lens formula - To describe and explain how the device works.	- Convex lens - Candle - Match box	Students in groups of 6 to construct simple microscope	-do- A.F. ABBOTT Pg. 269-Pg 272 M. Nelkcon 8th Ed. Pg 313-Pg 325	

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MAY	17	OPTICAL INSTRUMENTS	Compound microscope	2	- Guide the students to discuss the structure and mode of action of a compound microscope. - Help students to highlight the common uses of a compound microscope in daily life.	- Using ray diagram to show image formation and magnification of a compound microscope. - To discuss the uses of compound microscope in daily life.	- Chart of compound microscope - Lenses screen, objects.	-do-	Students in a group of 5-6 to construct a simple compound microscope.	
	18	12TH – 17 MAY - TERMINAL EXAMINATIONS								

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	/ 19	18TH – 25TH MAY - 1 WEEK HOLIDAY								
MAY	20		Astronomical telescope	2 2	- Guide students to describe the structure and mode of action of an astronomical telescope. - Highlight the uses of an astronomical telescope.	- To describe the structure and mode of action of a telescope - To list down the application of a telescope.	-Lenses. - Chart of an astronomical telescope	-do-	To construct a simple telescope.	

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JUNE	21		Projection lantern	2	- Lead students to discuss on the structure and mode of action of a projection lantern - Discuss, by demonstration, the uses of a projection lantern	- To participate in the discuss - To observe the function of the machine - To take notes	-Projection lantern - Slides -Chart of projection lantern	-do-	Students a group of 5-6 to construct a simple projectio n lantern	

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		OPTICAL INSTRUMENTS	Lens camera	2	- 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			
JUNE	22		The human eye	4	-Describe the structure and mode of action of a human eye. - Guide students to identify the defects of the human eye and how they can be connected - Ask students to write down the similarities of human eye and lens camera as a home work. -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	-do-		

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JU NE	23	THERMAL EXPANSION	Thermal energy Thermal expansion of solids	2 2 4	- Lead students to brainstorm on the concept of heat. - Highlight the sources of thermal energy in everyday life. - Guide students of differentiate between heat and temperature. - Lead students to demonstrate the expansion of solids using ball and ring experiment.	- To explain the concept of heat. - To name some source of heat they know. - To differentiate heat from temperature. - To follow the demonstration. - To perform various activities to demonstrate expansion and construction of solids	.Ball and ring Source of heart	AF. ABBOTT Pg 159-Pg 165 M. Nelkon 8TH ed Pg 175 –Pg 187		

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JUNE	24		Expansion of solids		- Guide 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 - Highlight on applications of the expansion of solids.	- To follow the discuss - To determine the coefficient of linear expansibility. - To do calculations on the applications of the formula				

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JUNE / JULY	25		Thermal expansion of liquid	4	- Guide students to explain the apparent expansion of a liquid. - Demonstrate the volume expansion of liquids (different) - Lead students to define volume expansivity of liquid	- To follow the discuss and participate on demonstration of expansion of different liquids. - To define the volume expansivity of a liquid	.Ball and ring -Source of heart.	AF. ABBOTT Pg 159-Pg 165 M. Nelkon 8TH ed Pg 175 –Pg 187		

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		THERMAL EXPANSION			- Guide students, through question, how hear affect the density of liquids. - Verify the anomalous expansion of water, and explain the application of liquids in everyday life.	- To state the effect of heat to the density of liquids. - To explain the anomalous expansion of water. - List the applications of expansion of liquid in everyday life.				
AUGUST	26		Thermal Expansion of gases	4	- Guide students to discuss the concept of the thermal expansion of gases. - Lead students to the statement of Charles's law and Boyle's law. - Lead students to derive the general gas law $\frac{pv}{} =$ constant r - Use the equation to solve problems.	- To explain the concept of thermal expansion of gases. - To state Charles's law. - To derive the relation $\frac{pv}{} =$ constant r and solve the problems using the general gas law relation -		Principal of Physics by M. Nelkon Pg 188-Pg 198. AF. ABBOT Pg 170-Pg 181		

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AUGUST	27	THERMAL ENERGY	**Absolute scale of temperature**	4	- Lead students by questions and answer technique to explain the concept of the absolute zero temperature and the absolute scale of temperature (Kelvin) - Guide students to convert in degree centigrade to Kelvin. - Lead students to convert in degree centigrade to Kelvin. - Lead students to discuss the value of standard temperature and pressure. - Guide students to explain the applications of expansion of gas in daily life	- To explain the concept of the absolute zero temperature and the absolute scale of temperature. - To do calculations on converting degree Celsius to Kelvin. - To discuss the values of standard temperature and pressure. - To explain the application of expansion of gas in daily life.	-Graph paper -Model of a position engine	Principals of Physics by M. Nelkon 8th Ed. Pg 190-192		
SEPTEMBER H 22TH – FEB 22ND	28/33	**21ST – 25TH JULY – MIDTERM EXAMS & 26TH JULY – 1ST SEPTEMBER, LONG VACATION**								
					- Guide students to brainstorm the	- To explain the concept of heat transfer.	-Brass rods -Wood a bar	Principles of Physics		

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	34	TRANSFER OF THERMAL ENERGY	Conduction	2	concept of heat transfer - Lead students to identify good and bad conductors of heat. - Help students to explain how heat losses due to conduction can be minimized. - Discuss with students the selective uses of good and bad conductors of heat in everyday life.	- To identify good and bad conductors of heat. - To lest down the mans of minimizing heat lost in a conductor. - To describe the uses of good and bad conductors of heat.	-Foam insulation. -Thick carpet -Curtains.	by M. Nelkon Pg. 175-231 .		

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SEPTEMBER										
	34		Convection	2	- Guide students to demonstrate convection currents in water using crystals of potassium permanganate. - Lead students to discuss heat transfer in liquids	- To follow the demonstration and describe their observation. - To discuss the formation of sea and land breezes during day and night.	-Smoke -Potassium permanganate -Water -Diagram of sea and land breezes	-do-		

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		TRANSFER OF THERMAL ENERGY			and gases using the kinetic theory of mater. - Guide students to minimize heat losses due to convection. - Guide students to minimize heat losses due to convection. - Guide students to discuss the mode of action of domestic hot water supply system.	- To identify the methods of minimizing heat loss due to convection. - To visit house with the hot water system.				
SEPTEMBER H 22TH – FEB 22ND	35		Radiations	4	- Guide students to brainstorm how heat from the sun reaches the earth's surface - Lead students to discuss on how thermal radiation can be detected - Guide students to demonstrate that black surfaces are good absorbers and emitters of radiant heat. - Guide students to discuss the way heat loss by radiation can be minimized by using thermos flask.	- Student to discuss on how heat from the sun reaches the earth's surface. - To detect thermal radiation using lens and concave reflector. - To expose two objects of black surface and white surface and observe which is a good absorbers and good emitters of radiant heat. - To discuss method of minimizing heat loss by using thermos flask.	-Thermometer -Concave reflector -Lens -Thermos flask	-do- .		

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	33/34	13th SEPT – 18th SEPT: MID-TERM TEST 18th SEPT – 26th SEPT: MID-TERM TEST								
SEPTEMBER	36	MEASUREMENT OF THERMAL ENERGY	Heart Capacity	4	- Discuss with the students on the factors which determine heat quantity of a substance. - Guide students to the definition of the heat capacity of s substance. - Highlight the concept of specific heat capacity of a substance.	- The name the factors which determine heat quantity of a substance. - To define capacity of a substance. - To find the S.I. Unit of heart capacity. - To do calculation on heat capacity and specific heat capacity of a substance	- Heat - Thermometer - Beaker	-do-		
SEPTEMBER 22TH – FEB 22ND	37		Change of State	4	- Lead students to demonstrate the behavior of particles in a solid, liquid and gases. - Lead students to discuss the concept of melting/freezing points of a substance. - Lead students to demonstrate the effect of the impurities of freezing point and boiling point of water.	- To explain the behavior of particles in a matter in terms of kinetic theory of gases. - To perform an experiment to determine the melting point of naphthalene, plot and interpret a cooling curve of naphthalene. - To find out the effect of impurities on the boiling and	-Naphthalene -thermometer -Test tube -Graph paper -ice -Salt -Water - Beaker	-do-		

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						freezing point of substance.				

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SEPTEMBER / OCTOBER	37 / 39		Change of state Effect of pressure on boiling point and freezing point	4	- Lead students to demonstrate the effect of pressure on the boiling point and freezing point of water. - Guide students to demonstrate the effect of phenomenon of regulation. - Highlight the concept of boiling and evaporation in respect to the kinetic theory of matter	- To find the effect of pressure on boiling point and freezing point of liquids. - To sit in group to discuss the concept of regulation. - To sit in group to discuss the concept of boiling and evaporation in terms of kinetic theory of matter	-Conical flask -Rubber band -Thermometer -Water -Ice block -Weight -Thin wire -Beaker	-do-		

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OC TO BE R	40		Latent heat of fusion and vaporization		- Guide students to discuss in groups the concept of the specific latent heat of fusion and vaporization of substance and its S.I. Units. - Lead students to discuss the heating of water into vapour and plot the temperature time graph to deduce the latent heat of vaporization.	- To discuss the concept of the specific latent heat of fusion and vaporization. - To find its S.I. Units. - 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	-Beaker -Thermometer -Water	-do-		

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OCTOBER	41	VAPOUR AND HUMIDITY	Refrigerator Vapour	2	- Display a chart of a diagram of a refrigerator and lead students to discuss the parts of it. - Describe the mechanism of the refrigeration. - Lead students to discuss the concept	- To discuss the parts of a refrigerator. - To listen - Follow the discussion and take notes - To explain the concept of evaporation	-Chart of diagram of refrigerator -Refrigerator -Ether spirit -Conical flask	-do-		

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					of evaporation of liquids. - Lead students to the factors affecting evaporation of liquid. - Help students to distinguish between saturated and unsaturated vapours.	- Students to discuss the effect of temperature pressure, surface area of the liquid, nature of the liquid and atmospheric conditions on evaporation. - To listen and take notes				
OCTOBER	41		Saturated vapour pressure (S.V.P) Humidity	2	- Lead students to discuss the increase of S.V.P of a volatile liquid due to temperature rise. - Guide students to discuss the concept of humidity. - Lead students to explain the process of dew formation and the factors that influence the formation of dew.	- To explain the effect of temperature on S.V.P of a liquid. - To take notes - To discuss, in group, the concept of humidity. - To demonstrate dew point in lab. And explain factors which influence the formation of dew.		-do-		
	40	8th November -12th 2010 – REGIONAL EXAMINATION								
MON	**WK**	**MAIN TOPIC**	**SUB TOPIC**	**No. PRD**	**TEACHERS ACTIVITIES**	**PUPILS ACTIVITIES**	**TEACHING AIDS**	**REF. BOOKS**	**PROJECT TWORK**	**REMARKS**

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OCTOBER	42		Relative humidity	2 2	- Lead students in determination of Relative Humidity of air using wet and dry bulb hydrometer. - Guide students to discuss the effect of R.H. in everyday life.	- To find R.H. from the dew point using Reginault's hygrometer. - To discuss the effects of R.H. in everyday life. - To take notes.	- Wet and dry bulb hygrometer.	-do-		
NOVEMBER	43	CURRENT ELECTRICITY	Emf and P.D		- Guide students to discuss the concept of emf and p.d. - Lead students to state the units of emf and p.d. - Guide students to measure the emf and p.d across a conductor - Lead students to connect and analyse simple electric circuits	- To discuss the concept of emf and p.d. - To take notes to state the unit of emf and p.d. - To measure emf and p.d. across a conductor. - To connect and analyse simple electric circuits		A.F ABBOTT 5th Ed. Pg. 404-409		