2023

PEAS Scheme of Work: Physics

CLASS : SENIOR THREE

Peas

PROMOTING EQUALITY IN AFRICAN SCHOOLS

Subject: PHYSICS Class: S3 Term: ONE Teacher's Name: …….

Time allocation (per lesson): 2 DOUBLES (80 MINUTES EACH) Periods per week: 4 PERIODS

YPR:
Y= yes, I taught the lesson
P= I partially taught it e.g. I didn't get through all the content.
R= I taught the lesson, but I think students would benefit from a review

Please indicate during which weeks S.3 learners will complete their Subject project.

Week Subtopics	Learning outcome	Methodology	Teaching/ Learning resources	Y P R
Theme: Mechanics and properties of matter **Topic: Linear and Non- linear motion** **Competency:** The learner should be able to devise activities to measure distance and short time intervals and he/she should be able to use the data to calculate the speed and acceleration of a moving object and explain their implications				
1.1 **Motion**	**L.O –** Understand and apply the relationship between speed, distance and time (u, s)	• Introduces the lesson by asking every learner in class to make any physical movement. Builds on learners' movements to give more scenarios/illustrations related to motion. Using probing questions, learners are tasked to reflect on the activities. • In groups, the teacher guides learners to plan and carry out an investigation to find the speed of	• Video clips related to motion like athletes race against time (Joshua Cheptegei). • Role play (learners walking & running). • Stop clock /watch • Calculator	

		someone walking, running & riding a bicycle (role play). • Introduces the formular of speed, using distance and time as demonstrated in the role play. • In groups, learners are tasked to solve numerical problems related to speed, time and distance. • Tasks each learner to determine speed of a specified moving body given a specific distance and time.		
1.2 **Terms used**	**L.O –** Understand the terms used in linear motion. That is; displacement, average speed, velocity (u, s)	• Builds on the knowledge learnt about motion in terms of distance and speed to explain the relationship between displacement, average speed, velocity and acceleration one at ago. Using probing questions, learners are tasked to reflect teacher's explanation. • Guides learners in their groups to relate the knowledge given to them to compare speed and average speed, velocity and acceleration • Derives the formulae for average speed, velocity and acceleration, using distance, displacement and time. • In groups, learners are tasked to solve numerical problems related to average speed, velocity, and acceleration • A learner is tasked to follow the steps taken while comparing and write a report about his or her findings	• Tape measure • Two stop clocks/watches • Pen • Notebook • Calculator	
2.1 **Numerical problems**	**L.O –** Understands acceleration and solve numerical problems in	• Asks learners to point out key terms in the definition of acceleration to derive the formulae for acceleration and explains how the formula is	• Calculators • Mathematical set • Notebook	

	relation to the formulae derived (u, s)	used to solve numerical problems related to motion • In groups a teacher guides learners on how to solve numerical problems using the formula derived • A learner solves numerical problem and present the findings for marking		
2.2 **Distance-time graphs**	**L.O –** Know how to represent the motion of a body graphically (u, s) Describe linear motion using distance time graphs (u, s)	• Displays a chart or uses a squared board to show motion using distance- time graph and tasks learners to study and share observations. • Uses learners' ideas to explain the steps followed to draw the distance time graph on a square board. • Following the teacher's demonstration, learners are tasked (in their groups) to draw the distance time graph. In addition, they also describe linear motion using distance-time graphs. • A learner is given different distances and respective time intervals and asked to draw a distance time graph and describe the motion of a body and hence present the findings to the entire members of the class.	• Sharp pencil • Graph paper • Wooden claps • Mathematical set • Tape measure • Stop clocks • Pegs • Tags A,B,C,D,E,F,G and Q • Lower secondary physics Learners book 3 page9 (vision publishers)	
3.1 **Velocity- time graphs**	**L.O –** Know how to construct velocity time graphs (u, s) Describe motion of a body using velocity time graphs (u)	• Displays a chart or uses a squared board to show motion using velocity- time graph and tasks learners to study and share observations. • Uses learners' ideas to explain the steps followed to draw the velocity time graph on a square board. • Learners are asked to follow the teacher's demonstration in their groups to construct velocity-time graphs.	• Sharp pencil • Graph paper • Mathematical set • Lower secondary physics Learners book 3 page10 (vision publishers)	

		• In groups, learners are given a table displaying velocities of a body and their respective time intervals and tasked to draw a velocity time graph while the teacher is guiding them. After learners are tasked to describe the trend of their graphs in relation to motion terms hence present the findings to the class. Harmonization is done to class • Individually, learners are given a mathematical problem to interpret and present the solutions graphically and submit their books for marking & feedback		
3.2 **Equations of motion**	**L.O –** Know the equations of motion (u) Know how to use the equations of motion (s)	• Explains to learners how they can present data and builds on it to illustrate that motion can be represented numerically. • Using a chart, he/she presents symbols used in equations, and asks learners to share what each symbol stands for. Teacher harmonizes learners input. • Using the equations, the teacher solves numerical problems on the blackboard while learners are following. • In groups learners are presented with a task to solve numerical problems. The teacher assesses, provides feedback for each group and after harmonization for the whole class. • Individually, learners are tasked to solve numerical problems and present the solutions to the teacher for marking and feedback.	• A calculator • Notebook • Lower secondary physics Learners book 3 page 13-14(vision publishers)	

4.1 **Motion under gravity**	**L.O –** Understand the acceleration of free falling bodies or thrown vertically upwards (u) Investigate motion of an object thrown vertically upwards(u, s)	• Throws simple object like a piece of chalk upwards and asks learners questions related acceleration of free falling bodies. • Builds on learners' responses to introduce and explain the knowledge behind motion of free falling bodies. Tasks learners in pairs to recall and share the linear equations of motions. Teachers uses responses to connect and explain equations of motion under gravity. • With an example, teacher illustrates how to calculate numerical problems using equations of motion of free falling bodies. • In groups, learners are tasked to investigate motion of an object thrown vertically upwards and share their findings to the class members, while the teacher harmonizes feedback. • Individual homework on the same subject is administered.	• Video clips showing free falling bodies • Projector to display video clips and images OR • Ball • Pen • Notebook • Physics lower secondary learners book page 16	
4.2 Motion under gravity **(graphical approach)**	**L.O –** Describe acceleration due to gravity using a simple pendulum (u, s)	• Uses a squared board and demonstrates how to draw velocity time graphs for a body thrown vertically upwards • Learners determine the acceleration due to gravity practically in their groups using teachers guidance • A learner is asked to check in the learners book and answer questions as instructed and there after submit the book for checking and marking	• String(at least 1m long) • Pendulum bob • Metre rule • Retort stand • Stop clock • Table • G-clamp	

5.1 **Ticker timer**	**L.O –** Measure acceleration using a ticker timer (u, s)	• Begins by displaying the image of a ticker timer to learners, describe its features and how it works. Explaining about the dots frequency and period • Demonstrates how to derive the formula for finding total time taken to print the dots using frequency, number of spaces • Guides learners in their groups on how to measure acceleration using a ticker timer to derive the formula for velocity When n is the number of dots, d is distance and f is frequency (practical activity) • Using the knowledge acquired from the experiment, a learner is tasked to solve numerical problems related to acceleration by a ticker timer	• Photos from the text books or images on internet (search by typing ticker timer using google or any other website) • Ticker timer of known frequency, a 12v ac power supply ticker tape two 4mm connecting leads and a pair of scissors, metre rule, graph paper and glue • Physics lower secondary learner's book 3 page 21	
5.2 **Linear momentum and collisions**	**L.O –** Understand linear momentum and collisions (u, s)	• Introduces the lesson by giving scenarios of colliding bodies and using the real classroom objects and related illustrations to explain linear momentum and collision • Demonstrates the steps taken to derive the formula for momentum • In groups, the teacher guides learners to define linear momentum and derive the formula for linear momentum change during and after collision. That is • In groups learners solve a mathematical problem numerically, while a teacher assesses and gives feedback.	• Textbook pictures showing colliding bodies • Calculator • Internet clips of colliding bodies	

		• Tasks learners individually to determine momentum using the formula derived.		
6.1 **Newton's laws of motion**	**L.O –** Understand and apply newton's laws of motion (u, s)	• Explains the laws of motion as formulated and described by Isaac Newton • Guides learners in groups to demonstrate newton's laws of motion and derive their formulae mathematically in relation to force and momentum • Using the equations, the teacher solves numerical problems on the blackboard while learners are following. • In groups learners are presented with a task to solve numerical problems. The teacher assesses, provides feedback for each group and after harmonization for the whole class. • Individually, learners are tasked to solve numerical problems and present the solutions to the teacher for marking.	• Diagrams showing the relevance of newton's law of motion either using internet or textbooks • Calculators to simplify numerical problems	
6.2 **Circular motion and motion in viscous fluids**	**L.O –** Know and understand motion in a circular path (k, u) Study the motion of an object in a circular path Understand motion in viscous fluids (u)	• Begins by asking learners to use their body parts (foot) to draw circles on ground and builds on it to explain circular motion of moving bodies and brings out scenarios and real life experiences of bodies moving while describing a circular path • Guides learners in groups to study motion of an object in a circular path. • Leads a discussion with learners in their groups and explain the implications of shape in birds, fish	• An object like a pendulum bob • A string to tie the pendulum bob and then spin it within hands	

		and planes in relation to motion of an object in a fluid • A learner is tasked to research and discuss the graphs showing variation of distance and velocity with time for an object falling through a viscous liquid and present his/her findings		
7.1 **Resultant force, mass and acceleration**	**L.O –** Differentiate between vector and scalar quantities and give examples of each (k, u) Understand that a number of forces can be represented by a single resultant force (u, s) Activity of integration	• Tell learners that mathematical quantities that are used to describe the motion of objects can be divided into two categories vector or scalar, and then explains the difference between vector and scalar quantities • Through the teachers explanation learners are guided to give examples of vector and scalar quantities • In groups learners use Pythagoras theorem to find the resultant force that represents many forces mathematically while a teacher assesses and gives feedback and harmonizes with class • Individually learners are given a numerical question and asked to work it out in their books and submit their books for marking • Gives an activity of integration • Learners do the activity of integration individually and submit their work	• Strong rope of at least 3m and even number of learners to pull it on either ends (tag of war) • Lower secondary physics Learners book 3 page38-41 (vision publishers)	

Theme: Light **Topic: Refraction, dispersion and colour** **Competency:** The learner should be able to understand the phenomenon of refraction and its effects.				
7.2 **Refraction of light**	Understand that light maybe refracted as it passes from one medium to another (u)	• Dips a stick in a beaker of full of water and asks learners questions related to refraction of light. • Builds on learners' responses to explain why an object appear bent as it is partially immersed in water and how a ray of light is refracted as it passes between two adjacent media • In groups with the guidance of the teacher, learners investigate how light is refracted practically • Individually, learners are tasked to study the terms used in refraction of light and write them in the books and forward their books for checking.	• Pencil • Water • Ruler • Glass beaker/glass jar • Charts displaying the diagrams about refraction	
8.1 **Refractive index**	**L.O –** Understand the concept of refractive index (u) Find numerically refractive index (s)	• Displays charts with illustrations showing a ray of light from one media crossing boundary to another media. Asks probing questions related to refraction. • Builds on learners' responses to explain the phenomenon of refractive index of a glass. • Using the chalkboard illustration a teacher explains the steps taken to derive the formula for refractive index for a ray of light passing different media boundaries and use it to solve numerical problems • In groups learners are tasked to use the derived formula to solve numerical problems related to	• Chalkboard illustrations showing light ray from one media and crossing a boundary • Lower secondary physics Learners book 3 page58 (vision publishers)	

		refractive index; while the teacher assesses and gives feedback to learners • Individually learners are given homework to work and asked to submit for marking after finishing it.		
8.2 **Refractive index**	**L.O –** Determine the refractive index of a glass block practically (u, s)	• Demonstrates the steps taken to determine the refractive index while learners are observing • With teacher's guidance learners in their groups practically carry out an experiment to determine the refractive index of a glass • Learners are tasked to record the results and use them to determine the refractive index of a glass block and share their findings with the class. Harmonization is done in class • Individually learners are given homework related to refractive index and are given time within their individual work should be submitted for checking.	• Rectangular glass block • 4 optical pins • 4 drawing pins • Geometry set • Soft board • Plain sheet of white paper	
9.1 **Total internal reflection**	**L.O –** Understand the concept of total internal reflection (u) Determining critical angle of a rectangular glass block (s)	• Explains the phenomenon of total internal reflection and critical angle in relation to total internal reflection • In groups learners investigate total internal reflection and critical angle • With teachers instructions learners in their groups are guided to determine critical angle of a rectangular glass block. • Learner is tasked to write a report of his/her findings	• Real life experience that explains total internal reflection like a pool of water on roads on hot days. • Rectangular glass block • Ray box • White paper • Mathematical set • Lower secondary physics Learners book 3 page 63 (vision publishers)	

9.2 **Critical angle and refractive index**	**L.O –** Demonstrating total internal reflection (k, u) Understand critical angle and refractive index (u)	• Gives learners the apparatus (locally available materials) to learner and explain the steps taken to investigate total internal reflection • In groups learners follow teachers instructions and demonstrate total internal reflection • Works with learners in to derive the relationship between critical angle and refractive index. • A learner is tasked to give make a report about his or her findings and present them to the entire class members.	• Laser pointer(very sharp light ray source) • Plastic bottle • Water/milk • Water bath • Nail • Calculator • Notebook • Lower secondary physics Learners book 3 page 64&65 (vision publishers)	
10.1 **Applications of total internal reflection**	**L.O –** Understand applications of total internal reflection (u, s, v/a)	• Explains the applications of total internal reflection to learners • In groups learners are guided to draw the diagrams of the applications of total internal reflections • A learner is asked to make a research and write a brief report on each application of total internal reflection	• Real life experience that explains total internal reflection like a pool of water on roads on hot days. • Lower secondary physics Learners book 3 page 66&67 (vision publishers)	

10.2 **White light dispersion**	**L.O –** Understand dispersion of light (u) Know that white light can be split into colored light by refraction (u, s)	• Explains the term dispersion of light using the real-life example of a rainbow • In groups learners with teachers guidance investigate the causes of light dispersion and how a prism splits white light into coloured light by refraction practically • A learner is tasked to produce a report about the findings and present to the rest of class members.	• Glass prism • Source of light(such as ray box, flash light or sunlight) • White paper • Lower secondary physics Learners book 3 page 67&68 (vision publishers)	
11.1 **Colours**	**L.O –** Understand colours reflected by objects (u) Differentiate primary and secondary colours (k, u, s) Understand colour filters and investigate light absorption and action of colour filters (u, s)	• Explains the differences of colours using their category types. That is; primary, secondary and tertiary colours • In groups, learners with teacher's guidance • Investigate appearance of objects in different colours. • Use colour filters to investigate why coloured objects appear coloured. • Each learner is asked to write notes on findings and then share to the class members.	• 3 blocks of red, blue and green colour • 3light bulbs; green, blue and red(in case you do not have them, use one bulb but wrap it with material of different colour like polythene	
11.2 **Colors on a TV set or Monitor screen**	**L.O –** Understand rage of different colors is shown on a television (u)	• Explain to learners the difference between analogue and LCD televisions • In pairs learners research under teachers guidance how: - Whole range of different colours is shown on a television screen although each point on the screen receives only red, green, and blue light	• Real screen and monitors and if cannot be accessed internet pictures and video clips are used • Notebook and a pen • Lower secondary physics Learners book 3	

		- Investigate how analogue and LCD televisions work • After research and investigation in group, • A learner from each group is tasked to write notes about his/ her findings.	page 76&77 (vision publishers)	
12	Activity of integration, marking the activity and giving feedback to learners and prepares report for learners			

Note: learning aids indicated in sow are not limited to what has been suggested. Teachers need to use their problem solving, critical thinking and creativity skills to ensure that learning activities and the teaching aids fit into the local context.

Subject: PHYSICS Class: S3 Term: TWO Teacher's Name: …….

Time allocation (per lesson): 2 DOUBLES (80 MINUTES EACH) Periods per week: 4 PERIODS

Week/sub topic	**Learning outcomes** {by the end of the lesson, a learner should be able to;}	**Methodology**	**Teaching/learning resources**	**Y P R**
Theme: light **Topic: lenses and optical instruments** **Competency:** the learner should be able to understand that lenses refract light to form images and these lenses can be applied in different optical instruments.				
1.1 **Lenses and types of lenses**	**L.O –** Understand a lens (k, u) Identify the types of lenses (k) Investigate how convex lenses concentrate light rays. (u)	• Narrates the origin of the lenses, how they are applied, and ask learners to give real life examples of devices that use lenses and what they are used for. • In groups, learners define a lens and identity the types of lenses as the teacher guides. • A learner is tasked to investigate how a convex lens concentrate light rays.	• Concave lens • Convex lens • Light rays from the sun • New vision lower secondary physics learner's book page 80-81	
1.2 **How a lens works**	**L.O –** Understand how a lens works (u) Study the terms used in lenses (k) Investigate the nature of images formed by lenses (u)	• Illustrates how the lens works using real life examples of devices that use lenses. • In pairs, learners discuss the terms used in lenses, as the teacher guides. • Each learner is tasked to investigate the nature of images formed by the lenses.	• Concave lens • Convex lens • Various objects • New vision lower secondary physics learner's book page 82-84	
2.1 **Ray diagrams**	**L.O –** Understand and draw ray diagrams (u, s) Compare the effect of converging and diverging lenses on parallel	• Builds on the information previously given about rays and explains key terms used in drawing ray diagrams , and asks learners to illustrate some ray diagrams • In groups, learners draw more ray diagrams, examine the effect of parallel rays on both diverging and converging lenses as guided by the teacher.	• Sharp pencil • Mathematical set • Note book • Graph books • New vision lower secondary physics	

	rays of light incident on them. (k, u) Draw ray diagrams on scale (s)	• A learned is tasked to draw scale drawings on the ray diagrams	learner's book page 85-91	
2.2 **Determination of focal length of a convex lens**	**L.O –** Determine the focal length of a convex lens using different methods (u, s) Solve numerical problems involving calculation of power of a lens (s)	• Explains real life meaning of focal length and demonstrates how the focal length is obtained using some methods. • In groups, learners are guided to determine the focal length of the convex lens using different methods. • A learner is tasked to calculate the power of the lenses	• Convex lens • Lens holder • Bulb • White screen • Dry cells • Connecting wires • Cell holders • Metre rule • Screen with a cross wire • New vision lower secondary physics learner's book page 92-96	
3.1 **Optical instruments** **[the human eye]**	**L.O –** Examine the applications of lenses in the optical instruments (u, v/a) Study the functions of the parts of the human eye. (k, u, v)	• Displays optical instruments that use lenses and ask learners to identify and explain where they are applied in real life situations. • In pairs, learners observe and study the structure of the human eye on the charts • A learner is tasked to outline the functions of the parts of the human eye.	• Charts with the human eye • Lens camera • Projector • Magnifying glass • New vision lower secondary physics learner's book page 97-100	
3.2 **Lens camera and a projector**	**L.O –** Explore the lens camera (u) Examine the parts of the projector and their functions (k, u)	• Narrates the components of the lens camera and ask learners to explain how it focuses the object/image • In pairs, learners are guided to discuss how the camera works, examine the parts of the projector • A learner is tasked to list the functions of each part of the projector	• Lens camera • Projector	

4.1 **Activity of integration**	Activity of integration	• Gives the activity of integration inform of scenario question • Learners do the activity of integration • Learners collect the done activity for marking	• Pieces of paper • Pen	
Theme: Waves **Topic: General wave properties** **Competency:** the learner should be able to investigate the properties of transverse and longitudinal wave forms and explain how waves transmit energy				
4.2 **Introduction to waves**	**L.O –** Understand a wave (u) Investigate energy transfer by a wave (u) Understand the terms used in a wave (k, u)	• Narrates the origin of a wave, its possible effects and ask learners if they have ever experienced any wave and explain that experience. • In groups, learners are guided to investigate how energy is transferred by a wave • A learned is tasked to define the terms used in waves	• Long rope • Water in the basin or pond • Radio • Peg • Small stones • New vision lower secondary physics learner's book page 104-105	
5.1 **Features of a wave and the wave equation**	**L.O –** Understand the basic features of the wave (u) Examine the relationship between the frequency and period (u, s) Examine the relationship between frequency, wave length and the speed of the wave (u, s)	• Explains the features of the wave and ask learners to identify the features of the wave. • In pairs, learners are guided to examine the relationship between frequency and period of the wave. • Each learner is tasked to find the relationship between frequency, wave length and the speed of the wave	• Wave graph • New vision lower secondary physics learner's book page 106-110	
5.2 **Numerical problems involving the application of the wave equation**	**L.O –** Solve the numerical problems involving the application of the wave equation (s)	• Solves a numerical problem generated from real life situation and ask learners to generate more problems related to propagation of the wave • • In groups, teacher guides a discussion of solving numerical problems	• Calculator • Note book	

		• A learner is tasked to solve more numerical problems given		
6.1 Classification of waves	**L.O –** Understand how waves are classified (k, u) Compare mechanical and electromagnetic waves (s) Investigate the nature of transverse and longitudinal waves (u, s)	• Explains how waves are classified depending on their characteristics and ask learners to classify different examples of waves. • In pairs, teacher leads a discussion about comparing mechanical and electromagnetic waves • A learner is tasked to investigate the nature of transverse and longitudinal waves	• Slinky spring • Rope • Rigid support • Pencil • Note book • Charts • New vision lower secondary physics learner's book page 111- 113	
6.2 **The ripple tank, progressive, and stationary waves**	**L.O –** Investigate the nature of waves using a ripple tank (s) Understand progressive and stationery wave and study their nature (u)	• Demonstrates the production of waves using locally made ripple tank • In groups, learners investigate the nature of waves using the ripple tank Learners are also guided in a discussion about progressive and stationary waves • A learner is tasked to examine the nature of these waves	• Locally modified ripple tank • Water • Rope • Rubber band • Stroboscope • New vision lower secondary physics learner's book page 115-117	
7.1 Electromagnetic waves	**L.O –** Examine the propagation, properties and application of electromagnetic waves (k, u, v) Understand the production of electromagnetic waves (u)	• Displays a poster of electromagnetic spectrum and ask questions about the displayed poster. • In groups, learners are guided to discuss the propagation, properties and applications waves • A learner uses internet to search about the production of electromagnetic waves	• Poster of electromagnetic spectrum • Internet source • New vision lower secondary physics learner's book page 118-119	
7.2	**L.O –** Investigate the effect of electromagnetic radiations (u)	• Explain electromagnetic radiations giving real life examples and ask learners to mentions some places	• Convex lese • White piece of paper	

Effects of electromagnetic radiations	**L.O –** Understand the nature and uses of both white and laser light. (u)	electromagnetic radiations are used and their effects • In pairs, learners investigate the effects of electromagnetic radiations as guided by the teacher. • A learner is tasked to explain the nature of white light and laser light.	• Note book and a pen • Access to internet • New vision lower secondary physics learners' book page 120-121	
8.1 Activity of integration	Activity of integration	• Gives an activity of integration • Learners do the activity of integration • Learners submit their worked activity of integration or marking	• Pieces of papers and a pen.	
Theme: WAVES **Topic: Sound and Waves** **Competency:** The learner should be able to describe the nature of sound waves and how they are transmitted by vibrations in a medium.				
8.2 **Introduction to Sound waves**	**L.O –** Understand sound waves (u) Investigate whether sound needs a material medium for transmission. (u, s)	• Narrates various scenarios that involve production of sound waves. • In pairs, learners are guided to find out different media through which sound can travel, and investigate whether it requires a material medium for transmission. • A learner is tasked to find out how sound is transmitted.	• Tuning fork • Bell Jar connected to a vacuum pump. • Electric bell • Batteries • New vision lower secondary physics learners' book page 126-127	
9.1 **Production of sound waves**	**L.O –** Investigate the production of sound waves. (u, s) Explore transmission of sound waves through air, water and solids (u)	• Explain how sound waves are produced. • In pairs, learners are guided to find out production of sound waves. • A learner is tasked to explain how sound travels in water and solids	• Tuning fork • Plastic ball {one-to-two-centimeter diameter} • Thread • Stand • Large needle • Rubber pad • Metal • Water	

			• Table • New vision lower secondary physics learners' book page 128-129	
9.2 **Frequency and pitch of sound waves**	**L.O –** the frequency and pitch of sound waves. (k, u) Explore applications of ultrasonic waves. (u, s)	• Explains frequency and pitch of sound waves • In groups, teacher guide learners to discuss the types of sound waves • A learner is tasked to explore the applications of ultrasonic sound waves.	• Access to internet • New vision lower secondary physics learners' book page 131-132	
10.1 **Loudness of sound**	**L.O –** Understand amplitude and loudness of sound (u) Examine the speed of sound in different media (s) Investigate factors that affect the speed of sound in a medium. (u)	• Narrates scenarios that involve loudness of sound and explains amplitude • In pairs, learners are guided to find out the speed of sound in different media. • A learner is tasked to investigate the factors that affect the speed of sound in a medium.	• Access to internet • New vision lower secondary physics learners' book page 132-135	
10.2 **Reflection of sound waves**	**L.O –** Understand reflection of sound waves (u) Study how reflection of sound waves occurs (u)	• Illustrates how reflection of sound waves take place. • In pairs, learners are guided to investigate the reflection of sound waves • A learner is tasked to verify the laws of reflection of sound waves.	• Two manila papers to make tubes • Ticking clock • Two wooden boards • New vision lower secondary physics learners' book page 137	
11.1 **Echoes**	**L.O –** Explore the occurrence and strength of echoes (u) Determine the speed of sound in air by Echo method. (u, s)	• Narrates scenarios where echoes are felt. • In pairs, learners discuss how the speed of sound in air can be determined by echo method. • A learner is tasked to determine the speed of sound in air by echo method.	• Sound clappers • Tape measure • Stop clock • Reflecting surface e.g wall	

			• New vision lower secondary physics learners' book page 138 -139	
11.2 Numerical problems involving speed of sound in air by echo method.	**L.O –** Solve numerical problems that involve the application of echo method. (s)	• Solves a numerical problem generated from real life situation and ask learners to generate more problems related to echoes • In groups, learners are guided as they solve some numerical problems • A learner is tasked to solve other given numerical problems.	• Calculator • Note book • New vision lower secondary physics learners' book page 140	
12.1 Echoes in small rooms	**L.O –** Examine why echoes are not heard in small rooms. (u, v) Explore application of echoes. (u, v)	• Explains why echoes are not heard in small rooms • In pairs, learners are guided to discuss where echoes are heard. • A learner is tasked to explain the applications o echoes	• Access to internet • Note book	
12.2 Activity of integration	**L.O –** Activity of integration	• Gives an Activity of integration in form of a scenario • Learners attempt the Activity of integration • Learners collect the done Activity of integration for marking.	• Pieces of papers and a pen	

Note: learning aids indicated in sow are not limited to what has been suggested. Teachers need to use their problem solving, critical thinking and creativity skills to ensure that learning activities and the teaching aids fit into the local context.

Subject: PHYSICS Class: S3 Term: THREE Teacher's Name: .....

Time allocation (per lesson): 2 DOUBLES (80 MINUTES EACH) Periods per week: 4 PERIODS

NOTE: Please indicate during which weeks S3 learners will complete their Physics project

Week/sub topic	Learning outcomes {by the end of the lesson, a learner should be able to;}	Methodology	Teaching/learning resources	Y P R
Theme: Heat **Topic: Heat quantity and Vapours** **Competency:** the learner should be able to explain heat capacity and latent heat and know common applications.				
1.1 **Heat Energy**	**L.O –** Understand how heat energy flow (u) Investigate heat capacities of deferent metals rays. (u, s)	• Narrates scenarios that involve the flow of heat energy • In groups, learners are guided to discuss how heat energy flows and investigate the heat capacities of different metals • Each learner is tasked to generate the formular for heat capacity.	• Four cylinders of copper • Aluminum • Iron • Lead {both metals should be identical} • Wax, beaker • Stand, water and source of heat. • New vision lower secondary physics learner's book 144-146	
1.2 **Effect of nature of a material, mass of**	**L.O –** Investigate the effect of mass and nature of a material on the heat capacity of a substance (u)	• Explains how the effect can be obtained • In groups, learners are guided to find out the effect of mass and nature of a material on heat capacity. • A learner is tasked to draw conclusions on the effect.	• Two calorimeters, water. Thermometer, heater, stirrer, cocking oil, stop clock, stand.	

a material on heat capacity.			• New vision lower secondary physics learner's book page 147-149	
2.1 **Specific heat capacity**	**L.O –** Understand specific heat capacity (u) Determine specific heat capacity of a solid by method of mixtures. (u, s)	• Explains specific heat capacity and gives some specific heat capacities of deferent substances • In groups, learners are guided to determine specific heat capacity of a solid by a method of mixtures. • A learner is tasked to state possible errors during the experiment.	• Water • Copper calorimeter • Stirrer, piece of metal, beaker, source of heat, thermometer, weighing scale. • New vision lower secondary physics learner's book page 150-153	
2.2 **Solving numerical problems that involve method of mixtures.**	**L.O –** Solve numerical problems. (s) Explore applications of specific heat capacity. (u, s)	• Solves a numerical problem generated from real life situation of mixtures (solid and a liquid) and ask learners to generate more problems related to heat. • In groups, learners are guided to solve other numerical problems. • A learner is tasked to solve more given numerical problems and state some applications of specific heat capacity.	• Calculator, note book and access to internet. • New vision lower secondary physics learner's book page 154	
3.1 **Latent heat**	**L.O –** Understand latent heat (u) Determine total heat energy required to convert a given mass of ice to steam. (s) Understand the concept of latent heat of fusion and vaporization. (u, s)	• Narrate scenarios related to latent heat and demonstrates how latent heat comes about, and ask learners to give real life situations that involve latent heat • In groups, learners are guided in a demonstration of latent heat, derive the expression that is used to determine amount of energy required to convert a given mass of ice to steam. • A learner is tasked to research about latent heat of fusion and vaporization.	• Source of heat, 200 g of ice cubes, glass beaker, tripod stand, wire gauze, thermometer, stop watch, stirrer, electronic mass meter. • New vision lower secondary physics	

			learner's book page 156-158	
3.2 **Energy in a storm**	**L.O –** Explore the origin of energy in a storm (u, s) Understand stearic acid changes with temperature (u) Investigate how stearic acid change with temperature. (s)	• Narrates scenarios of storm that have occurred in communities or villages and explains their origin. • In groups, teacher guide learners in discussion about stearic acid changes with temperature. • A learner is tasked to investigate how stearic acid changes with temperature.	• Internet, eye protection, beaker, boiling water, thermometer, stop clock, clamp and a stand, source of heat, tripod stand, graph paper and a sharp paper. • New vision lower secondary physics learners' book page 159-160	
4.1 **Specific latent heat of fusion**	**L.O –** Understand specific latent heat of fusion (k, u) Determine the specific latent heat of ice by method of mixtures. (u, s)	• Narrate scenarios related to specific latent heat of fusion and demonstrates how specific latent heat of fusion comes about, and ask learners to give real life situations that involve specific latent heat of fusion • In groups, teacher guide learners in determining the specific latent heat of fusion by method of mixtures. • A learner is tasked to state possible sources of errors in the experiment.	• Thermometer, calorimeter, hot water, pure melting ice, stirrer and a weighing scale. • New vision lower secondary physics learner's book page 161-162	
4.2 **Significance of high value of specific latent heat.**	**L.O –** Explore the significance of high value of specific latent heat of fusion. (u, s) Examine applications and implications of high specific heat capacity and	• Explains the concept of significance of high value of specific latent heat of fusion. • In groups, learners are guided to discuss the applications of high specific heat capacity and specific latent heat of water. • A learner is tasked to research about the implications of high specific heat capacity and specific latent heat of water.	• Internet • Note book • New vision lower secondary physics learner's book page 162-163	

	specific latent heat of water. (u, s)			
5.1 Specific latent heat of vaporization	**L.O –** Understand specific latent heat of vaporization. (u) **L.O –** Determine specific latent heat of vaporization of a liquid by method of mixtures. (s) Study the application and implication of high specific latent heat o vaporization. (k, u, v)	• Explains specific latent heat of vaporization and relate to real life situation, and ask learners to give more real life situation. • In groups, learners are guided to discuss and determine the specific latent heat of vaporization of a liquid by a method of mixtures. • A learner is tasked to find out the applications and implications of high specific latent heat of vaporization.	• Steam trap, thermometer, calorimeter, cold water, stirrer, weighing scale, cardboard • New vision lower secondary physics learner's book	
5.2 **Numerical problems involving specific latent heat of fusion and vaporization.**	**L.O –** Solve numerical problems of specific latent heat of fusion and vaporization. (s)	• Solves a numerical problem generated from real life situation and ask learners to generate more problems related to specific latent heat of fusion and vaporization. • In groups, learners are guided to solve other numerical problems. • A learner is tasked to solve more numerical problems	• Calculator • Note book • New vision lower secondary physics learner's book page 164-165	
6.1 **Vapours**	**L.O –** Understand vapour, saturated and unsaturated vapours. (u) Explore the concept of saturated vapour pressure and boiling. (u, s) Investigate the effect of reduced atmospheric	• Narrates scenarios that involve vapour, explains vapour, saturated and unsaturated vapours. • In groups, learners are guided to discuss the concept of saturated vapour pressure and boiling point of water. • A learner is tasked to investigate the effect of reduced atmospheric pressure on boiling point of water.	• Internet, water, flask, thermometer, heat source, clamp, rubber stopper. • New vision lower secondary physics learner's book page 167-169	

	pressure on boiling point of water. (u, s)			
6.2 **Evaporation**	**L.O –** Examine how a pressure cooker works. (s) Understand evaporation. (u) Compare boiling point and evaporation in terms of particle theory and understand cooling by evaporation. (u, s)	• Builds on the concept of pressure and vapous to illustrate a pressure cooker, and ask learners to identify the principle it uses. • In pairs learners are guided to describe how a pressure cooker works and discuss evaporation. • A learner is tasked to compare boiling and evaporation in terms in particle theory and explain cooling by evaporation.	• Internet. • New vision lower secondary physics learner's book page 170	
7.1 **Activity of integration.**	**L.O –** Activity of integration	• Gives the activity of integration. • Learners attempt the activity of integration. • Learners collect the activity for marking.	• Pieces of paper and pen.	
Theme: Earth and Space Physics **Topic: Stars and Galaxies** **Competency:** The learner should be able to understand the life of stars and the source of their energy.				
7.2 **The stars**	**L.O –** Understanding the source of energy in the star. (u) Understanding energy produced by the sun. (u) Appreciating the importance of energy produced by the sun to people on earth. (u, v/a)	• Narrates about the stars and ask learners to give some information about the star. • In groups, teacher guide learners to discuss about energy in a star and energy produced by the sun. • A learner is tasked to give importance of energy produced by the sun to people on earth.	• Internet • New vision lower secondary physics learner's book page 178-180	
8.1 **The size of the sun**	**L.O –** Study the size of the sun relative to other stars. (k, u, s)	• Use illustrations to explain the size of the sun compared to other stars.	• Internet.	

	Explore the variation in colour and brightness of stars in milky way. (k, u) Study the life cycle of the star (k, u)	• In groups, teacher guide learners in a discussion about the several colour and brightness of the stars. • A learner is tasked to research about the life cycle of the star.	• Video clip about the size of sun compared to other stars • New vision lower secondary physics learner's book page 181-184	
8.2 **Galaxies**	**L.O –** Understand galaxies (u) Examine how galaxies are formed. (k, u)	• Displays downloaded photos of solar system objects and asks learners to share whether they have ever seen them. Using probe questioning he/she tasks learners to reflect on their experience to class. • Bases on learners experience to clearly explain galaxies giving real life situations. • In groups, learners are guided to find out how galaxies are formed. • A learners is tasked to research about when the galaxies are observed.	• Internet • Video clips about galaxies • New vision lower secondary physics learners' book page 185&186	
9.1 **Activity of integration**	**L.O –** Activity of integration	• Gives an activity of integration • Learners do the activity of integration • Learners submit their worked activity of integration or marking	• Pieces of papers and a pen.	
Theme: Earth and space physics **Topic:** Satellites and communication **Competence:** The learner should be able to explain what artificial satellites are and how they are applied in space exploration and other field				

9.2 **Satellites**	**L.O –** Understand what satellites are. (u) Differentiate types of satellites (k, u) Sizes and altitudes of satellites (k, u)	• Narrates the knowledge about satellites in relation to the real operation of telephones, radios, or even watching a television and how they transfer information during communication. • Guides learners in their groups to differentiate the satellites and also differentiate the sizes and altitudes of satellites • Tasks a learner to research and make notes about the different types of artificial satellites, present their findings. • Harmonizes with learners' findings and correct errors in case they are found during presentation	• Telephones • Radios • Television • Satellite dishes of different kinds like • Zuku, DSTV, Star times • A picture of a mast, CCTV • New vision lower secondary physics learners' book page 192	
10.1 **Use of satellites** **Global positioning system**	**L.O –** Understand the importance of artificial satellite (k, u, v) Understand how satellites are positioned in global positioning system (k, u)	• Begins by explaining the relevance of satellites • In groups learners discuss and give the importance of satellite devices in daily life experience • Guides learners by explaining about global positioning system(GPS) and works with learners to investigate how satellites are used in global positioning systems • A learner is tasked to write brief notes about satellite system such as GPS, prepare a report of his/her finding and share it before the class., and the teacher harmonizes with the learners work after presentation	• Watching videos/simulations about the "working of GPS navigation system" on www.youtube.com. • Use internet or Microsoft Encarta • New vision lower secondary physics learners' book page195	

10.2 **Communication satellites**	**L.O –** Understand the international space station (u) Know the importance of the international space station (k, u) Understand and appreciate the value of photographs in space exploration (k, u)	• Begins a lesson by demonstrating the meaning of communication satellites and give the components of communication satellites • With the brief demonstration given, learners in their groups are asked to share their knowledge about communication satellites ever experienced • Explains the international space system and tasks learners to explain the importance of the international space system, share the findings with the rest of the class., and the teacher harmonizes with the rest of the class about their findings.	• Use internet or Microsoft Encarta OR • Watch youtube videos using the following search queries: • International space system- Documentary tube • Mission to mars: Future Mega protects – TDC • New vision lower secondary physics learners' book page 199	
11-12	Week 11 and 12 should be used to administer Activities of Integration, marking, and preparing end of term reports. In addition, this time should be used for end of year assessment.			

Note: 1 All the teaching and learning resources are not indicated in this scheme. A teacher can get more resources from other available sources that's to say, text books, local materials, etc

2. This scheme of work has simple learning outcomes which are achievable in each double period (they have been developed from the bigger learning outcomes in the syllabus book)