

**MINISTRY OF GENERAL EDUCATION
NATURAL SCIENCES DEPARTMENT
PROVINCIAL PHYSICS (5054) SCHEMES OF WORK**

GRADE: 10

TERM:1

YEAR:.....

SCHOOL:.....

WEEK	TOPIC	SUBTOPIC	EXPECTED OUTCOMES	METHODS	SUGGESTED EXPERIMENTS	REFERENCES
1	SCIENTIFIC MEASUREMENTS	<ul style="list-style-type: none"> ○ International System of Units (SI). 	<ul style="list-style-type: none"> ○ Distinguish between basic and derived quantities ○ Identify basic units and derived units. 	Question and answer Explanation	Use a chat showing basic and derived units	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition
2		International System of Units (SI).	<ul style="list-style-type: none"> ○ Recognise prefixes, multiples and submultiples of fundamental and derived units. 	Question and answer Explanation	Use a worksheet	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu)
3		International System of Units (SI).	<ul style="list-style-type: none"> ○ Use scientific notation and significant figures in numerical problems. 	Explanation Question and answer	Use a worksheet	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition

4	SCIENTIFIC MEASUREMENTS	<ul style="list-style-type: none"> ○ Length and time 	<ul style="list-style-type: none"> ○ Demonstrate the use of various measuring instruments to determine length ○ Demonstrate the use of clocks and devices for measuring an interval of time 	Experimentation Question and answer	Practical on how to use a Vernier callipers and micrometre screw	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) • Abbot Third Edition
5		<ul style="list-style-type: none"> ○ Length and time 	<ul style="list-style-type: none"> ○ Identify factors that affect the period of a simple pendulum 	Experimentation Question and answer	Practical on how to determine period of a simple pendulum Determine how length and angular displacement affect period of a pendulum	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition
6 7		<ul style="list-style-type: none"> ○ Mass and weight 	<ul style="list-style-type: none"> ○ Distinguish between mass and weight ○ Demonstrate how to measure mass and weight 	Experimentation Question and answer	Measure mass of different solids and liquids using an electronic balance or a Triple beam balance	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition
8	SCIENTIFIC MEASUREMENTS	<ul style="list-style-type: none"> ○ Centre of mass 	<ul style="list-style-type: none"> ○ Demonstrate how to locate the centre of mass of an object ○ Describe qualitatively the effect of the position of the centre of mass on the stability of an object 	Experimentation Discussion in groups of cooperative learning	Carry out an experiment on how to determine the centre of mass of a plane lamina.	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition

9	SCIENTIFIC MEASUREMENTS	<ul style="list-style-type: none"> ○ Density 	<ul style="list-style-type: none"> ○ Use a measuring cylinder correctly to Measure volumes of liquids ○ Measure volumes of regular and irregular solids 	Experimentation Question and answer	Measure volumes of different liquids using a measuring cylinder.	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition
10		<ul style="list-style-type: none"> ○ Relative density 	<ul style="list-style-type: none"> ○ Determine the density of floating objects ○ Determine the density of a mixture of liquids ○ Describe what relative density is ○ Calculate relative density of air 	Experimentation Discussion in groups	Determine the relative density of both regular and irregular solids. Determine densities of liquids	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition

11	MECHANICS	<ul style="list-style-type: none"> ○ Scalars and vectors 	<ul style="list-style-type: none"> ○ Describe what scalar and Vector quantities are ○ Distinguish between scalars and vectors ○ Demonstrate adding of vectors to determine the resultant ○ Demonstrate how to determine the resultant of two vectors graphically 	Demonstration Cooperative learning	Determine the resultant of two forces acting at an angle to each other	<ul style="list-style-type: none"> • Essentials of physics •Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
----	-----------	---	--	---------------------------------------	--	---

		<ul style="list-style-type: none"> ○ Linear motion 	<ul style="list-style-type: none"> ○ Describe the terms used in mechanics. ○ Demonstrate the use of equations of uniformly accelerated motion to solve problems $v = u + at$, $s = (v + u)t/2$, $s = ut + \frac{1}{2} at^2$ $v^2 = u^2 + 2as$ 	Discussion Question and answer	Use worksheets	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third Edition
13		<ul style="list-style-type: none"> ○ End of term test 	<ul style="list-style-type: none"> ○ Recall the term's work 	Question and answer	End of term practical tests	<ul style="list-style-type: none"> • Past exam papers

**MINISTRY OF GENERAL EDUCATION
NATURAL SCIENCES DEPARTMENT
PROVINCIAL PHYSIC S(5054) SCHEMES OF WORK**

GRADE: 10

TERM: 2

YEAR:.....

SCHOOL:.....

WEEK	TOPIC	SUBTOPIC	EXPETCED OUTCOMES	METHODS	SUGGESTED EXPERIMENTS	REFERENCES
1		➤ Linear motion	<ul style="list-style-type: none"> ○ Interpret graphical representation of distance-time, Displacement -time, speed-time, velocity-time and acceleration-time. 	Question and answer Discussion Cooperative learning	Use a worksheet	<ul style="list-style-type: none"> • Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
2		➤ Linear motion	<ul style="list-style-type: none"> ○ Describe the acceleration of free fall for a body near the earth. ○ Describe qualitatively the motion of bodies falling in a uniform gravitational field with and without air resistance 	Question and answer Discussion Cooperative learning	Use aworksheet	<ul style="list-style-type: none"> •Essentials of physics •Explaining physics •Physics 10-12 (L Muunyu) •Abbot Third edition

3		<p>➤ Forces (force and motion)</p>	<ul style="list-style-type: none"> ○ Explain what force is. ○ Explain the effect of forces on bodies. ○ Describe the inertia law of motion (describe Newton's laws of motion) ○ Demonstrate the relationship between force and acceleration ○ Demonstrate the relationship between mass and acceleration. ○ Perform calculations on force. 	<p>Explanation Discussion Question and answer</p>	<p>Use a Ticker tape timer to carry out an experiment to verify Newton's second law of motion</p>	<ul style="list-style-type: none"> • Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third edition
4		<p>➤ Forces (Hooke's law)</p>	<ul style="list-style-type: none"> ○ Investigate the effect of force on a spring. ○ Demonstrate the effects of friction on the motion of a body. 	<p>Experimentation Question and answer Discussion</p>	<p>Carry out an experiment to verify Hooke's law</p>	<ul style="list-style-type: none"> • Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
5		<p>➤ Forces (circular motion)</p>	<ul style="list-style-type: none"> ○ Describe the motion in a circular path due to a perpendicular force. 	<p>Discussion Question and answer Demonstration</p>	<p>Tie a stone to a string whirl it.</p>	<ul style="list-style-type: none"> • Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition

6		➤ Moment of forces	<ul style="list-style-type: none"> ○ Perform calculations based on the principle of moments. ○ Investigate the everyday application of moments. 	Experimentation Question and answer Question	Conduct an experiment to verify the principle of moments	<ul style="list-style-type: none"> • Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
7		➤ Work, Energy and power	<ul style="list-style-type: none"> ○ Explain the meaning of the terms work, energy and power. ○ Identify the units of measurement for work, energy and power ○ Calculate work using the appropriate formula 	Explanation Discussion in groups Experimentation	Using a spring balance and a wooden block, determine work done by a pulling force.	<ul style="list-style-type: none"> • Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
8		➤ Work, Energy and power	<ul style="list-style-type: none"> ○ Identify the different forms of energy ○ Explain qualitatively and quantitatively the terms gravitational potential and kinetic energy. 	Question and answer discussion	Use a worksheet	Essentials of physics • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition

9		Work, energy and power	<ul style="list-style-type: none"> ○ Describe sources of renewable and non renewable energy. ○ Explain the effects of the use of energy sources on the environment. ○ Demonstrate energy transformation from one form to another 	Explanation Discussion Question and answer	Use a chat showing energy transformation	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
10		➤ Work, energy and power	<ul style="list-style-type: none"> ○ Describe the conservation of energy ○ Calculate energy using mass and velocity ○ Demonstrate the calculation of efficiency of energy conversion using the appropriate formula ○ Demonstrate calculation of power using the appropriate formula 	Explanation Discussion Question and answer	Use a worksheet	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
11		➤ Simple machines	<ul style="list-style-type: none"> ○ Describe what a simple machine is ○ Identify the different types of simple machines. ○ Describe the distances moved by the effort and the load in a simple machine 	Demonstration Discussion in groups	Demonstrate an experiment on how to lift a load using a pulley system	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition

12		➤ Simple machines	<ul style="list-style-type: none"> ○ Explain the terms of Mechanical advantage (MA), Velocity Ratio (VR) and Efficiency ○ Perform calculations involving simple machines 	Experimentation Discussion in groups	Carry out an experiment to determine the efficiency of an inclined plane	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
13		➤ End of term tests	<ul style="list-style-type: none"> ○ Recall the term's work 	Question and answer	End of term practical tests	<ul style="list-style-type: none"> • Past exam papers

MINISTRY OF GENERAL EDUCATION

NATURAL SCIENCES

PROVINCIAL PHYSICS (5054) SCHEMES OF WORK

GRADE: 10

TERM: 3

YEAR:

SCHOOL:

WEEK	TOPIC	SUBTOPIC	EXPECTED OUTCOMES	METHODS	SUGGESTED EXPERIMENTS	REFERENCE
1		➤ Simple Machines	<ul style="list-style-type: none"> ○ Determine Mechanical advantage (MA), Velocity Ratio (VR) and Efficiency of the five basic simple machines 	Explanation Discussion Question and answer	Use a work sheet	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
2		➤ Simple machines	<ul style="list-style-type: none"> ○ Perform calculations involving simple machines 	Question and answer		Past exam papers
3		➤ Pressure	<ul style="list-style-type: none"> ○ Explain what pressure is. ○ Describe how pressure relate to force and area using appropriate examples and formula formula($P = F/A$) ○ (calculations using the formula $P = F/A$) 	Explanation Discussion Question and answer	Use a worksheet having questions on pressure	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition

4 5		➤ Pressure	<ul style="list-style-type: none"> ○ Identify factors affecting pressure in liquids. ○ Describe the transmission of pressure in hydraulic systems (Pascal's law) 	Explanation Discussion Question and answer Discussion in groups	Use Pascal's vessel to verify Pascal's principle	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
6		➤ Pressure	<ul style="list-style-type: none"> ○ The Hydraulic press machine ○ Carry out calculations on the hydraulic press machine 	Explanation Question and answer	Use a worksheet with questions on the hydraulic press	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
7		➤ Pressure	<ul style="list-style-type: none"> ○ Derive the relation $p = \rho gh$ ○ Calculate pressure in liquids using the relation, ○ $p = \rho gh$ 	Explanation Question and answer	Use a chat showing the derivation	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition

8		➤ Pressure	<ul style="list-style-type: none"> ○ Explain the mechanism of a mercury barometer. ○ Use the mechanism in determining atmospheric pressure 	Question and answer Discussion	Use a worksheet	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
9		➤ Pressure	<ul style="list-style-type: none"> ○ Explain the mechanism of 	Experimentation	Using the U-Tube	Essentials of physics

			<ul style="list-style-type: none"> ○ a manometer ○ Use the mechanism to determine gas pressure ○ Carry out calculations involving the manometer 	Question and answer Discussion	manometer determine atmospheric pressure	<ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
10		➤ Pressure	<ul style="list-style-type: none"> ○ Explain the law of floatation ○ Explain principles of up thrust and floatation. (Archimedes principle) 	Experimentation Discussion in groups Question and answer	Carryout an experiment to verify Archimedes principle	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
11		➤ Pressure	<ul style="list-style-type: none"> ○ Describe how up thrust relate to floatation in fluids. 	Explanation Discussion Question and answer	Use a worksheet	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
12		➤	<ul style="list-style-type: none"> ○ Carryout calculations on Archimedes principle 	Explanation Discussion Question and answer	Use a worksheet with questions on Archimedes principle	Essentials of physics <ul style="list-style-type: none"> • Explaining physics • Physics 10-12 (L Muunyu) • Abbot Third Edition
13		Tests	Recall the term's work	Question and answer	End of term practicals	Past exam papers

**MINISTRY OF GENERAL EDUCATION
PROVINCIAL SCHEMES OF WORK FOR PHYSICS**

Subject: PHYSICS (PURE 5054) **Grade:** 11 **Term:** ONE **Year:** 20.... **Teacher:** -----

WEEK	TOPIC	SUBTOPIC	EXPECTED OUTCOMES	METHODS	SUGGESTED EXPERIMENTS	REFERENCES
1	Thermal physics	❖ Simple kinetic theory of Matter.	<ul style="list-style-type: none"> ❖ Explain What the kinetic theory is ❖ Describe qualitatively the molecular model of matter. ❖ Explain changes of state in terms of the kinetic theory of matter 	Explanation Question and answer Discussion	Use worksheets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
2		❖ Simple kinetic theory of Matter.	<ul style="list-style-type: none"> ❖ .Apply kinetic theory to explain rates of diffusion, Brownian motion, evaporation and cooling effect of evaporation. ❖ Apply the kinetic theory to explain gas pressure. 	Explanation Question and answer Discussion	Use worksheeets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

3		❖ Measurement of temperature	<ul style="list-style-type: none"> ❖ Explain what temperature is ❖ Describe physical properties of substances which change with temperature. 	Demonstration Explanation Question and answer	Use thermometers to determine temperature of substances	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
4			<ul style="list-style-type: none"> ❖ Measure the temperature with thermometers ❖ Describe suitability of alcohol and mercury for use in liquid-in-glass thermometers. 	Demonstration Explanation Question and answer	Use thermometers to determine temperature of substances	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

5			<ul style="list-style-type: none"> ❖ Describe the relationship between the Celsius and Kelvin scales. ❖ Describe the structure and use of a thermocouple thermometer. 	<p>Demonstration Explanation Question and answer</p>	<p>Carryout an experiment to determine temperature using a thermocouple</p>	<p>Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.</p>
6			<ul style="list-style-type: none"> ❖ Demonstrate the measurement of temperature using an appropriate thermometer. 	<p>Demonstration Discussion Question and answer</p>	<p>Measure temperature using an appropriate thermometer</p>	<p>Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.</p>
7		<ul style="list-style-type: none"> ❖ Expansion of solids, liquids and gases. 	<ul style="list-style-type: none"> ❖ Describe qualitatively the thermal expansion of solids, liquids and gases. ❖ Explain the effects of expansion of water on aquatic life. ❖ Demonstrate that solids, liquids and gases expand at different rates. 	<p>Demonstration explanation</p>	<p>Use worksheets</p>	<p>Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.</p>

8			<ul style="list-style-type: none"> ❖ Demonstrate how to determine the boiling and melting point of different substances. ❖ Explain effects of pressure on the melting and boiling points. 	Demonstration explanation	Carry out an experiment to determine the boiling point and melting point of some substances	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
9			<ul style="list-style-type: none"> ❖ Investigate effects of impurities on the melting and boiling points of substances. 	Experimentation Question and answer discussion	Conduct an experiment to investigate the effects of impurities on the boiling point and melting point of substances	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
10			<ul style="list-style-type: none"> ❖ Demonstrate the effect of varying pressure on volume of a gas ❖ Describe the relationship between temperature and volume of a gas 	Experimentation Question and answer discussion	Carry out an experiment to demonstrate gas laws	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

11			<ul style="list-style-type: none"> ❖ Explain the Kelvin scale from the relationship between temperature and volume. Demonstrate the use of the ideal gas equation to solve simple numerical problems. $V_1/T_1 = V_2/T_2$ $(P_1V_1/T_1 = P_2V_2/T_2)$ 	<p>Explanation Discussion Question and answer</p>	Use worksheets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
12		❖ The Engine	<ul style="list-style-type: none"> ❖ Explain what an internal combustion engine is. 	<p>Explanation Discussion Question and answer</p>	Demonstrate the four stroke combustion engine	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
13		END OF TERM ONE TEST	END OF TERM ONE TEST	Question and answer	Conduct end of term practical tests	Past exam papers

MINISTRY OF GENERAL EDUCATION
PROVINCIAL SCHEMES OF WORK FOR PHYSICS

Subject: PHYSICS (PURE 5054) **Grade:** 11 **Term:** TWO **Year:** 20.... **Teacher:** -----

WEEK	TOPIC	SUBTOPIC	EXPECTED OUTCOME	METHOD	SUGGESTED EXPERIMENT	REFERENCE
1		The Engine	<ul style="list-style-type: none"> ❖ Identify the different parts of an internal combustion engine. ❖ Describe the operation of the spark plug. 	Explanation Question and answer	Use worksheet	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
2			<ul style="list-style-type: none"> ❖ Describe the different strokes in a four stroke internal combustion engine ❖ Describe efficiency of a diesel and petrol engine 	Explanation Discussion Question and answer	Use worksheets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

3		❖ Heat transfer by conduction, convection and radiation.	<ul style="list-style-type: none"> ❖ Explain methods of heat transfer. ❖ Use kinetic theory to explain heat transfer. ❖ Demonstrate heat conduction in different substances. ❖ Demonstrate the uses of bad and good conductors of heat. 	Explanation Discussion Question and answer	Demonstrate heat transfer by conduction using a chat	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
4		❖ Heat transfer by conduction, convection and radiation.	<ul style="list-style-type: none"> ❖ Demonstrate convection in liquids and gases. ❖ Demonstrate the differences between bad and good absorbers of radiant energy 	Explanation Discussion Question and answer demonstration	Use chat showing good and bad conductors of heat	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

5		<ul style="list-style-type: none"> ❖ Heat transfer by conduction, convection and radiation. 	<ul style="list-style-type: none"> ❖ Demonstrate the differences between good and bad heat emitters. ❖ Explain everyday's applications of knowledge on conduction, convection and radiation. 	<p>Explanation Discussion Question and answer demonstration</p>	<p>Use chat showing good and bad emitters of heat</p>	<p>Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.</p>

6		❖ Measurements of heat.	<ul style="list-style-type: none"> ❖ Demonstrate the difference between temperature and heat energy. ❖ Describe the terms of heat capacity and specific heat capacity. ❖ Identify the SI units of specific heat capacity 	<p>Demonstration Question and answer discussion</p>	<p>Use worksheets</p>	<p>Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.</p>
7			<ul style="list-style-type: none"> ❖ Demonstrate how to measure specific heat capacity of solids and liquids. ❖ Describe the terms latent heat, specific latent heat of fusion and of vaporisation. ❖ Demonstrate the solving of numerical problems on heat measurements 	<p>Experimentation Question and answer Discussion in groups</p>	<p>Carry out an experiment to determine the specific latent heat of fusion and vaporization</p>	<p>Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.</p>

8	Wave motion	❖ Simple ideas of the wave motion theory	<ul style="list-style-type: none"> ❖ Demonstrate wave motion. ❖ Distinguish between longitudinal and transverse waves. ❖ Describe the terms associated with waves ❖ Apply the wave equation in solving wave motion problems ❖ Explain the use of waves in everyday life. 	<p>Demonstration Explanation Question and answer discussion</p>	Use the helical spring to demonstrate a longitudinal wave	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
9		❖ Propagation of waves	<ul style="list-style-type: none"> ❖ Explain what propagation, reflection, refraction and diffraction of waves are ❖ Demonstrate constructive and destructive interference of waves 	<p>Explanation Discussion Question and answer</p>	Using a ripple tank, carry out an experiment to demonstrate constructive and destructive interference	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

10		❖ Electromagnetic spectrum	<ul style="list-style-type: none"> ❖ Describe main components of electromagnetic spectrum. ❖ Describe the properties of electromagnetic waves 	Explanation Discussion Question and answer	Use a Chat showing The electromagnetic spectrum	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
11			<ul style="list-style-type: none"> ❖ Identify the sources of each of the rays in the electromagnetic spectrum. ❖ Describe the method of detection each of the main component of the electromagnetic spectrum. 	Explanation Question and answer discussion	Use a chat showing detection methods of electromagnetic waves	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
12			<ul style="list-style-type: none"> ❖ Explain the use of each of the waves in the electromagnetic radiation spectrum. Explain the harmful effects of ultra violet radiation, gamma rays and x-rays to life. 	Explanation Question and answer Discussion	Use a chat showing uses of electromagnetic waves	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
13	End of term one test	End of term one test	End of term one test	Question and answer	Administer end of term practical test	Past exam papers

**MINISTRY OF GENERAL EDUCATION
PROVINCIAL SCHEMES OF WORK**

Subject: PHYSICS (PURE 5054) **Grade:** 11 **Term:** THREE **Year:** 20.... **Teacher:** -----

WEEK	TOPIC	SUBTOPIC	EXPECTED OUTCOMES	METHOD	SUGGESTED EXPERIMENTS	REFERENCE
1	❖ Sound		<ul style="list-style-type: none"> ❖ Explain how sound is produced. ❖ Describe what rarefactions and compressions are. ❖ Describe the approximate range of audible frequencies. ❖ Investigate that sounds requires a medium for transmission. ❖ Determine the speed of sound in air. 	<p>Explanation Question and answer</p>	Carry out an experiment to determine the speed of sound in air	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
2			<ul style="list-style-type: none"> ❖ Describe the relative speed of sound in solid, liquid and gas. ❖ Demonstrate the characteristics of sound waves. ❖ Describe the factors which influence the quality of sound. ❖ Describe what ultrasonic is ❖ Describe the uses of ultrasonic. ❖ State how to minimise 	<p>Demonstration Question and answer Explanation</p> <p>Demonstration Question and answer Explanation</p>	Use a chat showing characteristics of sound waves	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

			sound pollution			
3	❖ Light	❖ Rectilinear propagation of light	<ul style="list-style-type: none"> ❖ Describe the rectilinear propagation of light. ❖ Investigate the formation of shadows and eclipse. ❖ Describe reflection of light. ❖ Investigate the laws of reflection of light. ❖ Demonstrate the formation of images by plane mirrors. 	Experimentation Question and answer Discussion in groups	Carryout an experiment to investigate the laws of refraction	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
4			<ul style="list-style-type: none"> ❖ Demonstrate the formation of images by plane mirrors. ❖ Identify the position of an image using plane mirrors. 	Experimentation Demonstration Question and answer	Conduct an experiment to locate the position of an image formed in a plane mirror	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

5		❖ Refraction of light	<ul style="list-style-type: none"> ❖ Describe what refraction of light is ❖ Explain the terms of refraction of light ❖ Verify the laws of refraction of light. ❖ Describe what refractive index is. ❖ Investigate the refractive index of a glass block. 	Experimentation Question and answer Discussion in groups	Carry out an experiment on how to investigate the refractive index of glass	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
6			<ul style="list-style-type: none"> ❖ Calculate refractive index of a substance (n) using real and apparent depth. ❖ Explain the term 'critical angle'. ❖ Describe the relationship between critical angle and refractive index. ❖ Explain how total internal reflection occurs. ❖ Explain how total internal reflection is used. 	Explanation Discussion in groups	Use a chat showing total internal reflection	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

7		❖ Lenses.	<ul style="list-style-type: none"> ❖ Describe different types of lenses. ❖ Explain the action of lenses on beams of light. "$1/f = 1/u + 1/v$, : (P=1/f) ❖ Demonstrate how to determine the focal length, 	Demonstration Question and answer Discussion	Carry out an experiment to determine the lens equation	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
8			<ul style="list-style-type: none"> ❖ Calculate the power of the converging lens ❖ Demonstrate how to obtain images formed by converging lenses ❖ Describe the uses of lenses in everyday life. 	Demonstration Question and answer Discussion	Use a chat showing the uses of lenses	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
9	❖ Magnetism	❖ Simple phenomenon of magnetism.	<ul style="list-style-type: none"> ❖ Describe properties of Magnets ❖ Explain the domain theory of magnetism 	Demonstration Question and answer discussion	Use worksheets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.

10			<ul style="list-style-type: none"> ❖ Demonstrate induced magnetism. ❖ Demonstrate the making of a magnet 	Explanation Question and answer	Conduct an experiment on how to	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
11			<ul style="list-style-type: none"> ❖ Demonstrate the way to destroy a magnet ❖ Demonstrate the plotting of magnetic field lines. 	Demonstration Question and answer Discussion in groups	use worksheets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
12			<ul style="list-style-type: none"> ❖ Distinguish the magnetic properties of iron and steel. ❖ Explain the use of magnetic screening and magnetic keepers. ❖ Describe the uses of magnets 	Demonstration Question and answer Discussion in groups	use worksheets	Essentials of physics. Explaining physics. Physics (10-12) (L .MUUNYU) Abbot Third Edition.
13		END OF TERM THREE TEST	Recall the terms work	Question and answer		Past exam papers

MINISTRY OF GENERAL EDUCATION
PROVINCIAL SCHEMES OF WORK FOR PHYSICS

Subject: PHYSICS (PURE 5054) **Grade:** 12 **Term:** ONE **Year:** 20.... **Teacher:** -----

WEEK	TOPIC	SUB-TOPIC	SPECIFIC OUT-COMES	METHOD	SUGGESTED EXPERIMENT	REFERENCE
1	STATIC ELECTRICITY	Static Electricity	<ul style="list-style-type: none"> ○ Demonstrate the existence of static charges ○ Explain how to detect electric charges. ○ Describe the properties and uses of static charges ○ Describe the electric charging and discharging of objects. 	Demonstration Experimentation Discussion	Carry out an experiment on the existence of charges by rubbing some materials	Munyu physics Essentials of physics Pure physics Thinking process Abbot third edition
2		Static Electricity	<ul style="list-style-type: none"> ○ Explain the relationship between current and static electricity. ○ Investigate effects of static charges on the environment. 	Brain storming Question and answer demonstration	Carry out an experiment on charging and discharging of objects	Munyu physics Essentials of physics Pure physics Thinking process

3	CURRENT ELECTRICITY	Electric charge, current, and potential difference.	<ul style="list-style-type: none"> ○ Describe the terms associated with electricity ○ Identify the units of electric charge and current. ○ Demonstrate how to measure an electric current. ○ Describe what potential difference is. 	Experimentation Group discussion	<ul style="list-style-type: none"> ● Measuring an electric current using an ammeter. 	Munyu physics Essentials of physics Pure physics Thinking process Abbot third edition
4	CURRENT ELECTRICITY	Electric charge, current, and potential difference.	<ul style="list-style-type: none"> ○ Describe what the volt is. ○ Differentiate between potential difference (PD) and electromotive force (EMF). ○ Describe the basic concept of EMF. ○ Demonstrate the measuring of potential difference (PD) and electromotive force (EMF). 	Experimentation Group discussion	Measuring potential difference using a voltmeter	Munyu physics Essentials of physics Pure physics Thinking process Abbot third edition
5	CURRENT ELECTRICITY	Electric cells	<ul style="list-style-type: none"> ○ Describe the structure of primary and secondary cells. ○ Demonstrate charging and discharging of the accumulator. ○ Identify methods of disposal of used cells 	Discovery Brain storming demonstration	Investigating charging and discharging an acid accumulator	Munyu physics Essentials of physics Pure physics Thinking process Abbot third edition
6	CURRENT ELECTRICITY	Electrical resistance	<ul style="list-style-type: none"> ○ Explain the meaning of the resistance ○ Demonstrate how to determine resistance in a simple circuit. ○ Describe the relationship between current and potential 	Question and answer Group discussion	Measure the current and potential difference, using a voltmeter and	Munyu physics Essentials of physics

			difference in Ohmic and non Ohmic conductors.		an ammeter	
7			<ul style="list-style-type: none"> ○ Describe what the internal resistance of a cell is. ○ Calculate the resistance in series and parallel circuits with Ohm's law 	Demonstration Question and answer		Pure physics Thinking process Abbot third edition
8	CURRENT ELECTRICITY	Heating effect of an electric current.	<ul style="list-style-type: none"> ○ Demonstrate energy transformations in an electric circuit. ○ Investigate the heating effect of an electric current. ○ Demonstrate how to calculate electrical energy. 	Demonstration Question and answer Discovery	Investigate the heating effect of an electric current in heating appliances.	Munyu physics Essentials of physics
9	CURRENT ELECTRICITY		<ul style="list-style-type: none"> ○ Describe the relationship of voltage, current and power. ○ Demonstrate how to calculate the cost of using electrical Energy 	Demonstration Question and answer Discover		Pure physics Thinking process Abbot third edition
10	CURRENT ELECTRICITY	Heating effect of an electric current	<ul style="list-style-type: none"> ○ Describe the use of switches, fuses, earthing and the three pin-plugs. ○ Explain the need for earthing metal cases and for double Insulation. 	Brain storming Discussion Demonstration		Munyu physics Essentials of physics Pure physics Thinking process

11		Heating effect of an electric current	<ul style="list-style-type: none"> ○ Describe the meaning of three wires found in the cable ○ Describe the Domestic electrical wiring system ○ Describe ways of conserving electrical energy in homes and industry. 	Brain storming Discussion Demonstration		Abbot third edition Munyu physics Essentials of physics Pure physics Thinking process
12	ELECTRO MAGNETIC INDUCTION	The phenomenon of electromagnetic induction.	<ul style="list-style-type: none"> ○ Investigate the phenomenon of electro-magnetic induction. ○ Describe the factors affecting magnitude and direction of induced EMF. ○ State the direction of current produced by an induced EMF 	Experimentation Discussion	Carry out an experiment on the induction of an EMF/current using a magnet, a coil	Munyu physics Essentials of physics Pure physics Thinking process
13	END OF TERM TEST		Recall the terms work		Past examination papers	

MINISTRY OF GENERAL EDUCATION
PROVINCIAL SCHEMES OF WORK FOR PHYSICS

Subject: PHYSICS (PURE 5054) **Grade:** 12 **Term:** TWO **Year:** 20.... **Teacher:** -----

WEEK	TOPIC	SUB-TOPIC	EXPECTED OUT-COMES	METHOD	SUGGESTED EXPERIMENT	REFERENCE
1	Electromagnetic induction	The simple A.C. and D.C. generators	<ul style="list-style-type: none"> ○ Describe simple A.C. and D.C. generators. ○ Compare the simple A.A. generator with a simple D.C. generator in terms of structure and its nature. ○ Describe the action of a diode in rectification. ○ Explain conversion of an A.C. generator to a D.C. generator. ○ Contrast the current produced by the D.C. generator with that produced from batteries. 	<p>Discussion</p> <p>Question and answer</p> <p>Demonstration</p>	<p>Using charts all real objects</p> <p>Compare and contrast structure and nature of an A.C and D.C generators</p>	<p>Munyu physics</p> <p>Essentials of physics</p> <p>Pure physics Thinking process</p> <p>Abbot third edition</p>
2	Electromagnetic induction	Transformer	<ul style="list-style-type: none"> ○ Demonstrate the principles of mutual induction. ○ Describe the structure and operation of iron core transformers. 	<p>Question and answer</p> <p>Group discussion</p>		<p>Munyu physics</p> <p>Essentials of physics</p> <p>Pure physics Thinking</p>

			<ul style="list-style-type: none"> ○ Apply the transformer and power equations to solve numerical problems involving ideal transformers 			<p>process</p> <p>Abbot third edition</p>
3	Electromagnetic induction	Transformer.	<ul style="list-style-type: none"> ○ Calculate the efficiency of a transformer given data. ○ Explain advantages of high alternating potential difference power transmission. ○ Describe the implications of underground power transmission compared to overhead lines. ○ Describe the effects of improper management of transformers 	<p>Demonstration</p> <p>Question and answer</p>		<p>Munyu physics</p> <p>Essentials of physics</p> <p>Pure physics Thinking process</p> <p>Abbot third edition</p>
4	Basic electronics Basic electronics	Thermionic emission and electrons.	<ul style="list-style-type: none"> ○ Describe What thermionic emission is ○ Investigate properties of cathode rays ○ Distinguish between direction of flow of electrons and flow of conventional current. ○ Describe applications 	<p>Question and answer</p> <p>Group Discussion</p>	<p>Using a cathode ray</p> <p>Investigate properties of a C.R.O</p> <p>Show the basic structure of a C.R.O</p>	<p>Munyu physics</p> <p>Essentials of physics</p> <p>Pure physics Thinking</p>

			<ul style="list-style-type: none"> ○ of electron beams. ○ Describe basic structure and action of cathode-ray oscilloscope. ○ Describe the uses of cathode-ray oscilloscope. 	Demonstration	Measure quantities using a C.R.O	process Abbot third edition
5	Basic electronics	Circuit components.	<ul style="list-style-type: none"> ○ Identify symbols of basic circuit component. ○ Determine resistor values using standard colour codes. ○ Describe action of variable potential divider. ○ Explain the action and application of thermistor and light dependent resistors. 	Question and answer Demonstration Discussion		Munyu physics Essentials of physics Pure physics Thinking process Abbot third edition
6	Basic electronics		<ul style="list-style-type: none"> ○ Investigate the charging and discharging of capacitors. ○ Describe the role of capacitors in electronic equipments. ○ Explain how a reed and relay switches work. ○ Describe application 	Demonstration Question and answer Discussion		Munyu physics Essentials of physics Pure physics Thinking process

			of reed switch and reed relay.			Abbot third edition
7	Basic electronics	Simple Electronic Systems.	<ul style="list-style-type: none"> ○ Describe the action of a bipolar transistor. ○ State the different types of logic gates. ○ Demonstrate how to derive the truth tables of logic gates. ○ Describe the use of bistable and astable circuits. 	<p>Experimentation</p> <p>Group discussion</p> <p>Question and answer</p>	<p>Carry out an experiment to Investigate truth tables of logic gates using numbers of 0 and 1 in inputs and out puts</p> <p>Carry out an experiment to to show how a bistable and abistable work</p>	<p>Munyu physics</p> <p>Essentials of physics</p> <p>Pure physics</p> <p>Thinking process</p> <p>Abbot third edition</p>
8	. Atomic physics	Nuclear atom	<ul style="list-style-type: none"> ○ Describe the structure of the atom. ○ Describe the composition of the nucleus in terms of protons and neutrons. ○ Explain mass number 	<p>Question and answer</p> <p>Brainstorming</p>		<p>Munyu physics</p> <p>Essentials of physics</p>

			and atomic number.			Pure physics Thinking process Abbot third edition
9		Radioactivity	<ul style="list-style-type: none"> ○ Describe the nature of radioactivity. ○ Describe the characteristics of the three kinds of radioactive radiations: alpha, beta and gamma. ○ Describe methods of detecting radioactive emissions ○ Explain the origin and effects of background radiations ○ Describe what radioactive decay is. 	<p>Demonstration</p> <p>Group discussion</p> <p>Question and answer</p>	<p>Demonstrate the nature of radio activity using a chart</p> <p>Carry out an experiment to investigate radiation using a G.M counter</p>	<p>Munyu physics</p> <p>Essentials of physics</p> <p>Pure physics Thinking process</p> <p>Abbot third edition</p>
10		Radioactivity	<ul style="list-style-type: none"> ○ Describe what nuclear fusion and fission is. ○ Demonstrate how to 	Demonstration	Demonstrate management practices which	Munyu physics

			<p>determine half life of a radioactive material.</p> <ul style="list-style-type: none"> ○ Explain uses of radioactive substances. ○ Describe the safety precautions necessary when handling or storing radioactive substances. ○ Explain the effects of radioactive substances on the environment and health. ○ Investigate management practices which safeguard the environment from radioactive contamination. 	<p>Group Discussion</p> <p>Question and answer</p>	<p>safeguard the environment from radioactive contamination</p>	<p>Essentials of physics</p> <p>Pure physics Thinking process</p> <p>Abbot third edition</p>
11-13	PROVINCIAL MOCK EXAMINATION					Past examination papers