Secondary Mathematics Syllabus

Years 7 - 9

CURRICULUM DEVELOPMENT DIVISION

Solomon Islands Government

SECONDARY

MATHEMATICS SYLLABUS

Years 7 - 9

Ministry of Education and
Human Resources Development

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Foreword

The Solomon Islands Education System is currently undergoing significant restructuring and reform in response to the needs identified through the development of the Education Sector Investment and Reform Programme (ESIRP) and Education Strategic Plans (ESP). Curriculum Review and Reform Program (CRRP) is a process identified to develop a comprehensive curriculum that is fair and responsive to the needs of all Solomon Islanders in order to achieve the vision and national goals of the education system advocated in the National Education Action Plans (NEAP 2007 – 2009 & 2010 – 2012) and Education Strategic Framework (2007 – 2015).

The new Mathematics Syllabus is to be used by Secondary mathematics teachers to teach Years 7 to 9 in Secondary Schools throughout the country. It is developed as a guiding framework to meet the teaching and learning needs in all secondary schools. The programme of study presented in this syllabus contributes significantly towards the holistic development of the learner as an individual and the achievement of human integral development.

This is a key document and it forms the basis of the curriculum shift from a curriculum defined in terms of subject content to a curriculum defined in terms of what learners are expected to know, understand, and be able to do, value and appreciate. This is an outcome based education model and curriculum approach based on the achievement of learning outcomes through a learner centred, problem posing and the use of multiple intelligence education philosophy.

This syllabus builds upon concepts, skills, attitudes and values from the Primary Mathematics learning as well as from the learners home environment and links them to the concepts, skills, attitudes and values in this syllabus. It also forms a background for further learning beyond Year 9 as well as preparing individual learners for future life in the Solomon Islands.

The development and implementation of this syllabus is a step towards providing relevant and meaningful learning experiences for our children. It is important that all policy makers, teachers, education authorities and other important education stakeholders support the implementation of this syllabus.

As the Minister responsible for the provision of education services in the Solomon Islands, I now endorse this syllabus as the official document for teaching and learning of Mathematics in Secondary Schools throughout the Solomon Islands.

Hon. Reuben Dick Inoana Ha'amori
Honourable Minister of Education, 2013
Ministry of Education and Human Resources Development

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- Secondary Mathematics Advisory Committee members (2004 – 2009)
- Secondary Mathematics Workshop Participants (annual June workshops, 2004 – 2009)
- Secondary Mathematics Working Group members (2007-2010)

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Section 1. INTRODUCTION

The National Curriculum Statement states that Education is a lifelong learning process. In Solomon Islands, an outcome based education approach was adapted to develop the Mathematics syllabus and learning and teaching materials. The Mathematics Syllabus has been designed using Learning Outcomes which identify the knowledge, skills, attitudes and values that all Learners should achieve and demonstrate by the end of Year Nine (Yr. 9). The syllabus integrates Mathematics and local knowledge to ensure the syllabus provides relevant skills and knowledge for all learners. Mathematics is one of the national curriculum learning areas which builds on the teaching and learning of fundamental knowledge and skills from Year 1 to 6 in the Primary level.

Learning Mathematics is essential in understanding the world in which we live and work. It helps people to think critically and constructively in how they participated in various activities in real life situations. It also be used as a tool that involves investigating the living, physical, materials and technological components of the environment and creative processes of investigation and exploring natural and man-made processes in the environment. It also be used in the field of science where people including learners could investigate body of knowledge with a hope of making important contributions to the decisions which are shaping our world and the world for future generations. The syllabus also provides learners with time and space to reflect on how mathematics had been taught and learnt in the Solomon Islands vast diverse systems of indigenous knowledge development and skills that had been used and transferred from parents to children in the past years till today. Learners can be able to explore inter-relationships between contemporary models of Mathematics in the modern era and traditional ways so that meaningful skills and resources would be acquired for them to use for their survival not only in this life but in the future.

The syllabus emphasizes learners working individually and in groups, in planning and conducting investigations. They evaluate issues and problems, identify questions for inquiry and draw evidenced based conclusions from their investigations. Through this problem solving process they develop their critical thinking skills and creativity. Learners are provided with experiences in making informed decisions about the environment, the natural and technological world and in communicating their understanding, ideas and perceptions. The practical nature of the subject must be emphasized through hands on activities that will occupy a substantial amount of time. All learners will be required to undertake research projects', hands on" practical investigations and other individual tasks. The Mathematics Curriculum is designed to encourage all learners to continue their participation in Mathematics education as a compulsory subject and beyond. With ability and interest in Mathematics, some will continue to study Mathematics as an integrated subject, some will study specialist Mathematics subjects and others may do both.

Assessment is an important component of teaching and learning and is integrated into the teaching and learning activities of Mathematics. The emphasis is on continuous assessment and as such will provide feedback to learners and the teacher on learner's progress towards achievements of the learning outcomes. It helps learners improve their standards of achievements by knowing what they need to do well and where they need to improve. In Mathematics, teachers will gather evidence from learner's work during the course of the term and uses those continuous assessments to improve their teaching and learner's learning.

To promote a contemporary and comprehensive Mathematics education, this curriculum has been organized into learning strands where they covers the main branch of Mathematics . The five (5) strands in Mathematics are: Numbers, Statistics, Geometry, Algebra and Trigonometry. These strands are further sub-divided into sub-stands where coverage of the contents of the strands are more wider and very specific.

Section 2. RATIONALE

Mathematic is the study of numbers, quantity, space, structure and change. There are many views among mathematicians and philosophers regarding its definition due to the ambiguity of mathematics but we can simply look at it as a study of all possible patterns (Walter Warwick Sawyer, 1955).

In this life people cannot go without mathematics because it affects all aspects of life. Those people who have difficulty in understanding mathematics would apparently have difficulties in life because mathematics is used throughout the world as an essential tool in many fields, including natural science, engineering, medicine, finance and the social sciences. It is a unique and powerful way of viewing the world around us and very vital in the survival of mankind.

Study of Mathematics will equip Solomon Islands learners with effective strategies for investigating, interpreting, explaining, and making sense of the world. Mathematicians and statisticians use symbols, graphs and diagrams to help them find and communicate patterns and relationships. They draw on a wide range of social, cultural, scientific, technological, environmental, health and economic contexts to create models to represent both in real-life and hypothetical situations.

By studying Mathematics, learners develop the ability to think creatively, critically, strategically, and logically. They learn to structure and to organize, to carry out procedures flexibly and accurately, to process and communicate information, and to enjoy intellectual challenge.

Solomon Islanders who study mathematics will able to develop the knowledge, understanding, skills and attitudes to use mathematics in its applications in everyday life, in other learning areas, and in workplaces. They will learn to create models and predict outcomes, to conjecture, to justify and verify, and to seek patterns and generalizations. They will also learn to estimate with reasonableness, calculate with precision, and understand when results are precise and when they must be interpreted with uncertainty.

Mathematics is not just a body of knowledge and skills but a way of life through interpreting, predicting and understanding the world. As learners develop their numeracy skills and understanding of key concepts, they should grow more confident and motivated in their mathematical explorations. Learners need to develop self-confidence, dispositions and competence to solve practical problems. Problem solving empowers learners to take risks and the perseverance to solve problems that do not have an immediate solution.

Teachers do facilitate in this process by modelling the belief to learners that they can succeed in life only if they generate a learning environment where learners can develop positive attitudes towards learning of mathematicsboth in and outside of the classroom where they can apply them to help them in real life situations.

Solomons Islands needs its population to be mathematically literate if it is to navigate and be successful in the twenty-first century successfully. A high standard of numeracy is essential in every school to guarantee a healthy future for our learners. A country with no solid mathematical base is like a ship that travels in the ocean with no radar to assist in navigating the ship to safely reach home. As the saying goes, “A life without Mathematics is a life living in a vacuum.”

Section 3. AIMS

Mathematics education aims to enable learners to:

- continuously learn and acquire necessary mathematical concepts and skills for everyday life.
- develop the necessary process that mathematical concepts and skills can be acquired and applied in practical situations.
- develop the abilities for learners to learn through cooperative or group work and independently.
- develop the mathematical thinking and problem solving skills and apply these skills to formulate and solve problems.
- the ability to acquire mathematics concepts and skills and make connections among maths ideas and between mathematics and other ideas.
- learn the abilities to apply basic Mathematics skills and concepts appropriately and accurately to realistic situations, especially Solomon Islanders by using their own experiences.
- apply the variety of mathematical tools both in the technology world and simple rural set up for one's own survival and advancement.
- develop imaginative thinkers using mathematics ideas with the hope that they develop abilities to reason logically and communicate mathematically cooperatively and independently in the academic world.

This part of the syllabus is presented as a table. It shows the format in which each page of the main syllabus is presented. The template identifies the structure of the main syllabus with its different components.

Subject: Title	**Year level: no**	
Strand: Title		
Sub – strand: Title **Periods: No. of Periods** A strand is divided into sub-strands each with a Statement (Theme). The statement indicate the main areas of study that is covered in that particular Sub – strand under that particular Strand. In this section it has the title of the sub – strand and the Sub – stand Statement.		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
General Learning Outcomes are general statements that state what learners will know, understand, or appreciate as a result of a learning activity. General Learning Outcomes are usually expressed as *Knowledge (k), Understanding (u), Skills (s), Attitudes (a) or Values (v):* • know … ***(k)*** • understand … ***(u)*** • be able to do … ***(s)*** • appreciate … ***(a/v)*** General Learning Outcome is coded (numbered) in the syllabus, for example: **7.1.1** know how to convert a 3 – Dimensional solid (with flat faces) into a planar graph ***(k)*** **7.2.1** *etc*	***Specific Learning Outcomes*** are specific statements that specify what learners can do and demonstrate if they have achieved the Learning Outcomes. They are usually observable and measurable. The specific learning outcomes are coded (numbered) in the syllabus, learner's book, teacher's guide, learner's record sheet, learners monitoring sheet and learner's report sheet, for example: **7.1.1.1** draw angles and name them **7.1.1.2** name and classify angle according their sizes	For Specific Learning Outcomes, there is a ***Suggested Assessment Event.*** This is a suggested way of assessing one or more Specific Learning Outcomes formally for the purposes of knowing and recording the learner's achievements and progress. Other Specific Learning Outcomes will also be assessed but the assessment need not be recorded. Assessment events must involve the four domains; *Knowledge (k), Understanding (u), Skills / Application (s/a) and Values / Attitude (v/a).* Examples are given in this column in the syllabus. Other activities or assessment events are also in the learner's book.

Section 5. STRAND STATEMENTS

This section basically gives a summary outline of the contents that are covered by each of the five (5) Main Strands in mathematics such as: Numbers, Algebra, Geometry, Statistics and Trigonometry. One exception to this is the Strand Trigonometry. It is not covered in Year 7 and 8 therefore we insert Measurement as a Strand to replace it. From Year 9 and up-ward we use Trigonometry as one of the main strands and therefore Measurement is omitted from the strands. The main strands that are given here are the main strands that are taught in the Secondary level in the Solomon Islands, from Years 7 to 9.

Strand 1: Number

Numbers are symbols that are used to represent the numerical values that identify certain quantities that are obtain through counting, the four operations and measuring. This strand covers a range of topics that deal with numbers such as Whole Numbers, Decimals, Fractions, Directed Numbers and the Real Number System. It also covers such topics as Percentages, Indicies and Rates and Ratios.

The full understanding of numbers enables learners to be more competent in the field of numeracy. Numbers provide the foundation for future mathematical proficiency; this is attributed to the hierarchical nature of Mathematics. Numbers promote the quantifying of integers and rational quantities by exploring, calculating and using various Mathematical operations such as addition, subtraction, multiplication and division. Learners need to develop Number Sense, that is an awareness and understanding about what numbers are, their relationships, their magnitude, the relative effect of operating on numbers, including the use of mental mathematics and estimation when solving problems of real life contexts. They need to develop a reliable intuition about numbers and their relationships.

A better understanding of numeracy which comprises a large portion of this syllabus will enable learners to be better equipped and be confident to tackle other challenges in this subject and more importantly challenges in real life.

Strand 2: Measurement

Measurement is the assignment of a numerical value to an attribute of an object. Learners first develop an understanding of measurement by comparing and ordering objects and using terms such as shorter and longer. Later, they appreciate the need for standard units and apply them to an increasing range of attributes, including distance, area, volume, capacity, mass, speed, time, temperature and money.

The study of measurement is crucial in the mathematics curriculum because of its practicality and use in many aspects of everyday life. The study of measurement also provides an opportunity for learning about other areas of mathematics, such as number operations, geometric ideas, statistical concepts, and notions of function. Learners need apply appropriate techniques, tools, and formulas to determine measurements and develop their understanding of precision in measurement should expand. They need to develop a sense of everyday units so that they can estimate and round calculations appropriately.

Strand 3: Algebra

This strand provides opportunities for learners to recognise patterns, variables, terms, expressions and equations enabling them to explain their relationships. It will extend their understanding on the process of simplifying algebraic expressions, solving algebraic equations and graphing linear equations.

Having acquired relevant algebraic knowledge and skills, learners will also develop the ability to think abstractly and use symbols, notations, graphs and diagrams to represent and communicate mathematical relationships and concepts. In addition learners can confidently solve practical problems in the real world where algebra is needed.

Strand 4: Geometry

Geometry is a part of mathematics concerned with questions of size, shape, relative position of figures and with properties of space. It provides opportunities for learners to gain knowledge and skills of geometrical properties in polygons, parallel lines, coordinate planes, polyhedra, transformations, measurements and angle properties. The field of astronomy, especially mapping the positions of the stars and planets on the celestial sphere is just one of the many areas where geometry is being applied. Architectural work, surveying, drafting, etc. are some of the many fields where geometry is also applied.

Strand 5: Trigonometry

Trigonometry is a branch of mathematics that studies triangles, particularly the relationships between the sides and angles of right - angled triangles using trigonometric functions: Sine Ratio = Opposite Side is divide by Hypotenuse (SOH); Cosine Ratio = Adjacent is divide by Hypotenuse (CAH); and Tangent Ratio = Opposite side is divide by Hypotenuse (TOA) and Pythagoras' Theorem.

Trigonometry has applications that are important in many branches of pure mathematics as well as applied mathematics and consequently remains applicable in the natural sciences. It is used in astronomy, architecture, navigation, surveying and engineering. Thus learners can apply its concepts to solve problems in everyday life.

Strand 6: Statistics & Probability

Statistics is the science of making effective use of numerical data relating to groups of individuals or experiments. It deals with all aspects of collecting, organizing, presenting and interpreting of information in numerical form, about a population or a sample population. It also deals with planning of how data is collected, in terms of designing of surveys and experiments. Data collected are organized into frequency tables which then can be represented using various graphs like column and histogram graphs, pie charts, etc.. Data in tables and graphs can be interpreted and analysed using the range and measure of central tendency to draw conclusions.

Probability is a way of expressing knowledge or belief that an event will occur or has occurred. In mathematics the concept has been given more meaningful with the use of the probability theory where it focuses on the 'chance' for various events to occur. It involves quantitative analysis of data.

Probability is used extensively in such area as mathematics, statistics, finance, gambling, science and philosophy where conclusions are drawn about the likelihood of potential events to occur.

Section 6. PROCESSES AND SKILLS

The ultimate aim of teaching and learning mathematics is for learners to be able to experience new experiences as new mathematical skills and ideas are being learnt and acquired. Learners should explore and develop mathematical ideas in depth so that it would help them to develop a deep understanding of mathematical concepts and skills that would assist them to make sense of various mathematical ideas and skills in their connections and applications in real life situations. Mathematical skills that are covered here include procedural skills for numerical calculation, algebraic manipulation, spatial visualisation, data analysis, and measurement. The processes of learning and acquiring these skills are equally as important as learning those skills because these two must go together in order for the learners to become competent in the learning and application of mathematical skills in life. The table given below presents the range of Skills and the Processes in which these skills are transmitted and acquired by learners.

Processes	Procedural Skills for Numerical Calculations	Algebraic Manipulations & Spatial Visualisation	Data Analysis, and Measurement
1. Questioning	▪ Learners to ask different types of questions such as *How, Why*, *What* etc in relation to how answers have been achieved ad the steps they follow to get those answers. ▪ Compute using the four main operations with given formulae to do numerical calculations and solve problems.	▪ Learners to ask different types of questions that are based on prior mathematic knowledge in comparison to new concepts taught and learnt. ▪ Asking questions on how variables are manipulated and equated ▪ Look at the relationships between them	▪ Learners to ask different types of questions such as *How, Why*, *What* etc on how data are collected, methods used ▪ How data ar being analysed ▪ How lengths, area, volumes etc are being determined
2. Communicating	▪ Talk and communicate between Learner to Learner, Teacher to Learner about solving numerical calculations by following steps and procedures. ▪ Use group work for learners for them to be able to discuss and communicate among themselves	▪ Use group work to work together in find the missing values that are represented by the pronumerals that would make the statement true. ▪ Evaluation equations to make the statement true and share answers	▪ Learners to do practical work in groups and do presentations after finding and analysing the results

Processes	Procedural Skills for Numerical Calculations	Algebraic Manipulations & Spatial Visualisation	Data Analysis, and Measurement
3. Reasoning	▪ Learning the abilities of how to follow logical steps and procedures of how mathematical problems are solve. ▪ Also, know how to handle practical problems that are encountered and experience in real life situations.	▪ Try to find out why such pronumerals are evaluated when other variables are given values ▪ Evaluate and find the reasons why like terms are put together ▪ How equations are solves simultaneously	▪ Analyse data and able to make conclusions and recommendations regarding the data collected ▪ Find the reasons why some months in a year are very wet compared to others
4. Applying Strategies	▪ Learners would develop, select, and use range of strategies including short cuts to explore and solve numerical calculations by following steps and procedures	▪ Learners would develop range of strategies on how to manipulate algebraic expressions and equations to make the statement true and equate them to given values. ▪ Learners to develop the ability to mentally visualise and manipulate expressions and 2&3 Dimensional objects	▪ Learners apply various strategies on how data can be collected, tabulated, graphed and analysed. ▪ Learners can analyse data and draw conclusions ▪ Apply various strategies and approaches of how measurement of objects can be determined.
5. Reflecting	▪ Learners to reflect on their experiences and prior knowledge through critical thinking to make connections with general knowledge and new experiences	▪ Learners to develop the ability to reflect critically on methods chosen to apply mathematical ideas and techniques to unfamiliar problems arising in everyday life.	▪ Learners to make connections with the use of Mathematics in real world by identifying where and how particular ideas and concepts are used in real world

Section 7. CONTRIBUTION TO KEY LEARNING OUTCOMES

Mathematics is increasingly important in the Solomon Islands and our technological society as well. It enhances our understanding of the world around us and the quality of our participation in all aspects of life. It can be seen as a tool that can be used and applied anywhere and everywhere. Its applications extend beyond the walls of the classroom which apparently used in our cultures, entrepreneurship, trading in businesses, technology, personal well-being and many more. Therefore learners must learn to deal readily and efficiently with commonly occurring situations using the skills and knowledge obtain from the learning of mathematics. Solomon Islanders need mathematics not only for survival but for long life learning. Selling consumable products on the street of Honiara are some of the classic example of mathematics being employed as a tool for living.

Key Learning Areas	Mathematics Education Contribution
1. Culture Promotion Awareness of the Solomon Islands culture; in particular the promotion of the concept of 'unity in diversity', the need for equity and inclusiveness	The variety of patterns portrayed in the traditional houses, carving, and traditional dances are evidences of a potent colourful culture. The study of mathematics through the provision of accurate and standard instruments and equipment will further enhance the otherwise limited knowledge in the traditional society. Our traditional societies also have their own counting systems that are unique in their own ways
2. Life-long Learning Realizing that learning is a lifelong experience; encouragement of innovation, creativity, and a positive view of learning post-school	Critical and analytical thinking gained through the study of mathematics would encourage learners to develop self-taught and learning through observations and hand-on activities. These would help them to gain new knowledge and experiences that would be used to solve problems in a changing society that we live in and every day in life.
3. Ethics and Good Citizenship Development of positive, moral and ethical values, with respect to others, based on personal integrity and social responsibility; focus on value education, civic and citizenship, peace and reconciliation.	One of the outstanding attributes of mathematics is its demand for precise accurate answers. Following rules and processes to get an expected outcome/answer enable citizens to be aware of the prevailing laws of cause and effect.
4. Peace and Reconciliation Development of positive attitudes with the minds and heart to create peace, reconciliation and to be able to leave peacefully in harmony in a multi ethnic and diverse community.	Solving a problem in this discipline requires rules that need to be precisely followed or applied. Likewise social disharmony is a direct result of disruption of the social norms and rules.
5. Technology Use of traditional and modern technology to improve livelihood and community standard of living.	Pythagoras' theorem and measurements can be applied to house construction and the concepts of money predominantly use mathematics to provide people with necessary tools to be self sufficient and self dependent.

Key Learning Areas	Mathematics Education Contribution
6. Entrepreneurship The development of entrepreneurial skills for job creation through initiative and creativity	The comprehensive understanding of money advocated in this subject is a powerful tool that will assist and encourage people to confidently pursue their own businesses.
7. Environment, Conservation, Personal,social and Health Development Development of interactive skills, social sensitivity, environmental and health awareness and good practices	Thought provoking discussions where learners are provided with a dilemma and through logical thinking, discuss the processes involved to provide solutions. This offers the springboard for students to develop their personal and interpersonal skills.
8. Development of the Whole Person The learning of Mathematics raises self-esteem of a person. They become critical thinks which enable them to solve problems face in real life situations.	Learners become confident and well informed person in the community. They would be able to participate well in the society and make significant contributions to the community and whole country as a whole.

8.1 Learning and Teaching Approaches

Mathematics concepts, ideas and skills are inter-twined, interdependent and hierarchical, thus mastering of earlier concepts and skills is critical to achieving optimal learning of new and higher concepts in the hierarchy of concepts. It is this nature of mathematics that sometimes results in some learners dreading learning mathematics.

Mathematics as a subject is full of abstract concepts and representing them as tangible end-products in real life is a difficulty. Despite this, it is envisaged that the teacher should create a learning environment in which learner should achieve an optimal level of learning from the experience.

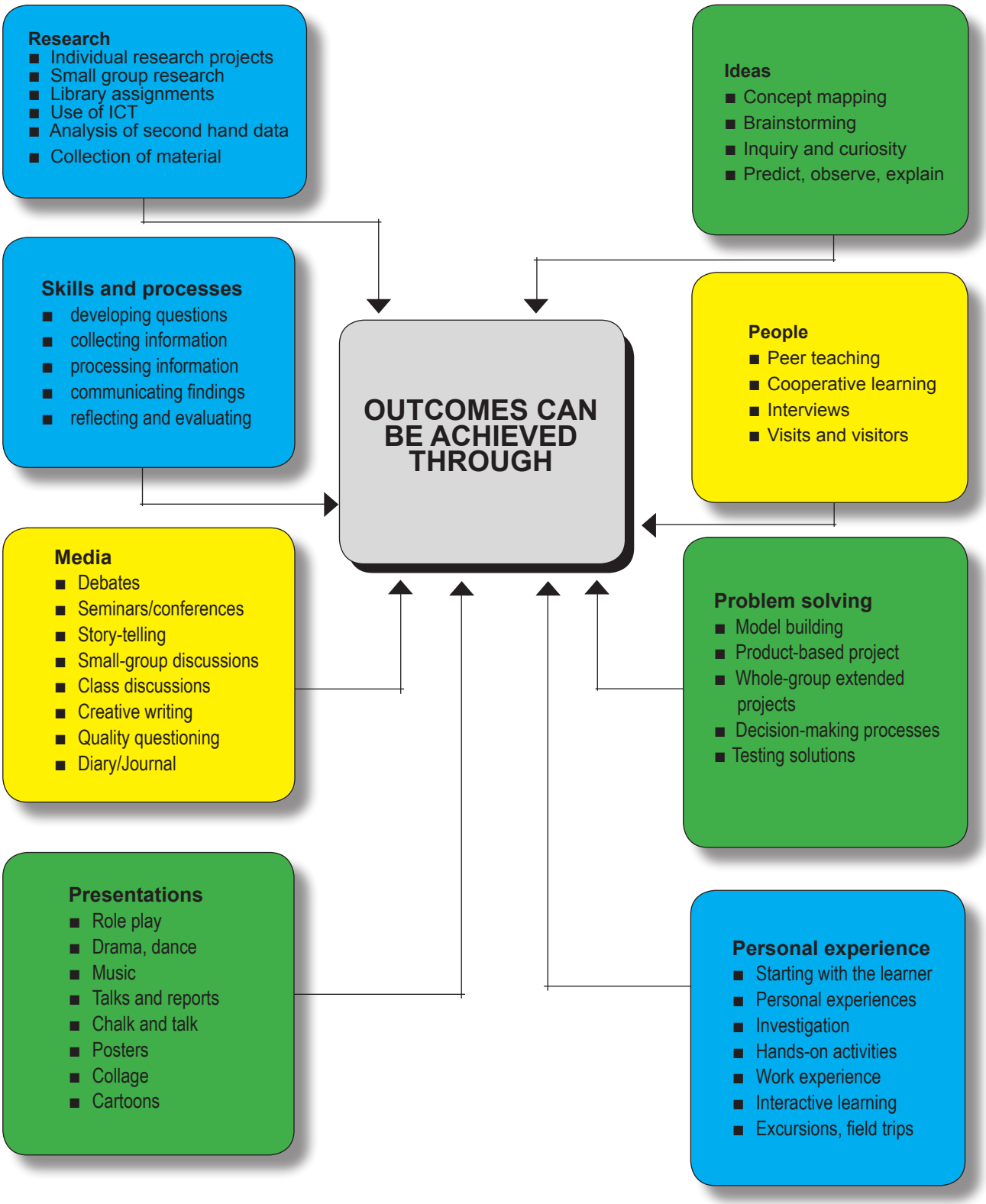
The teacher is encouraged to use practical lessons as much as possible and use meaningful contexts for activities that learners can relate to. While it is often tempting to provide learners with a rule to apply to solve a particular problem, if learners can appreciate the logic of the rule, they are less likely to learn mathematics by understanding than by rote. However, sometimes information has to be given direct to learners rather than deriving it because there are languages issues e.g. properties of shapes, names of objects, position of index numbers, etc. Below are some suggested teaching approaches.

- construction of simple equipment or models
- use of measuring tools, equipment and apparatus
- practical open-ended problems, either inside or outside the classroom
- observation, recording and analysis of data
- direct instruction from the teacher to learner
- survey analysis using a well-designed questionnaire
- independent studies by giving learner's a choice of topics to research
- demonstration either by the teacher or a learner by the use of tables and pictures etc
- class discussion and debate
- practitioner's talk or guest speakers
- field trips
- journal and log book
- homework tasks
- puzzles or games to practice skills
- peer teaching
- unit tests

NB. The Teacher is to ensure that appropriate materials are available. Go through the notes in the sub - strand first for ideas. These approaches do not stop a teacher from employing a method independently or a combination of one or two methods

Teaching Strategies

A range of strategies for helping learners to achieve the overall learning outcomes are shown below. They are grouped into 8 categories.



8.2 Links with other Subjects

Mathematics provides many concepts and skills that are utilized in other subjects' areas where learners study in schools. All teachers need to emphasise these links and demonstrate how particular numeracy skills are applied to their subjects, and mathematics teachers need to reinforce these links by using cross-curricular contexts to teach different topics. Measurement is one example of the fundamental skills acquired in mathematics which is often employed by other disciplines. Different disciplines may use alternative formulas and units but the core principles of measurement calculations are still upheld. Some examples of subject links are:

1. Science	
Maths Strands / Chapters/ Units	**Link description with Science syllabus**
Measurement	▪ A number of basic physics experiments involve measurement, ie distance, speed , acceleration, mass and time
Algebra	▪ Balancing equations in chemistry
Statistics	▪ Reading charts, and the collection, analysis and presentation of data
Percentages	▪ Results expressed in percentages

2. Social Studies	
Maths Strands / Chapters/ Units	**Link description with Social Studies syllabus**
Mapping	▪ Reading of maps, interpreting a scale, and able to use scales when sketching maps
Trigonometry	▪ Identifying directions using a compass, maps and bearings
Statistics	▪ Demonstrating the behaviour of populations using statistics, charts & graphs
Percentages	▪ In charts, data and graphs, pollution distribution may be expressed as a percentage

3. Business Studies	
Maths Strands / Chapters/ Units	**Link description with Business Studies syllabus**
Number	▪ General calculations of money requires mastery of basic operations
Money	▪ Calculations of cost price, selling price, profit, mark-up
Statistics	▪ Using charts to demonstrate business behaviour
Percentages	▪ Expressing mark-up or discount as a percentage

4. Agriculture	
Maths Strands / Chapters/ Units	**Link description with Agriculture syllabus**
Ratio and Proportion	▪ Mixing animal feed and insecticide spray
Money	▪ Relativity of costs and selling of products
Percentage	▪ Most quantities are usually expressed as a percentage
Measurement	▪ Crop yielding per area, spacing of crops when planting, construction growth and development

5. Home Economics	
Maths Strands / Chapters/ Units	**Link description with Home Economics syllabus**
Ratio and Proportion	▪ Essential for recipe measurements, designs and patterns
Money	▪ Knowledge of costs and selling prices
Statistics	▪ Demonstration of characteristics using graphs and charts
Percentages	▪ Ratios and quantities sometimes involve percentages
Geometry	▪ Designs and patterns using transformations

6. Technology	
Maths Strands / Chapters/ Units	**Link description with Technology syllabus**
Measurement	▪ Involves construction of objects which requires measurement
Geometry	▪ Knowing the shapes and their properties in constructions
Trigonometry	▪ At times use to calculate distances (height)
Money	▪ Basic understanding on cost prices and selling prices

7. Health Education	
Maths Strands / Chapters/ Units	**Link description with Health Education syllabus**
Money	▪ Basic understanding on how income affects health
Measurement	▪ Growth and development, medicinal doses, temperature and blood pressure
Statistics	▪ Charts are used for demonstration and presentation, reading of charts is also critical in the study of the reproductive system and other health issues

8. Physical Education	
Maths Strands / Chapters/ Units	**Link description with Physical Education syllabus**
Measurement	▪ Marking out play areas, goals, nets, balls, posts, rings
Rates	▪ Measures the speed of athletes

9. Arts and Culture	
Maths Strands / Chapters/ Units	**Link description with Arts and Culture syllabus**
Geometry	▪ Pattern and sequencing is featured in our art works and symmetry
Estimation	▪ Patterns in art works are basically
Probability and Chance	▪ Some of the cultural beliefs and events are based on chance

10. English	
Maths Strands / Chapters/ Units	**Link description with English syllabus**
The main issue in the English-mathematics relationship is the transferring of mathematical ideas into English and vice-versa to be understood clearly	

8.4 Assessment, Recording, Monitoring and Reporting

8.4.1 Assessment in Mathematics

Assessment should be continuous and consistent throughout the year so there must be a balance spread of events to achieve the suggested outcomes for each sub - strand. Mathematics is one of the major subjects that is examined at the end of year 9. It is assessed by a written examination cumulative from year 7 to year 9.

8.4.2 Suggested Assessment Strategy and Criteria

Assessment techniques should be selected to best suit the context in which the learning outcomes are being demonstrated and the type of evidence required. Teachers should familiarise learners with the techniques through modelling and practice to re-emphasize concepts taught.

Types of assessment	Assessment Strategy Examples	Assessment Criteria Learners can be assessed on:
▪ Practical Activities	▪ Read bar chart, pie chart or thermometer ▪ Weigh and measure the mass of objects ▪ Use equipment such as a metre ruler to measure height, a trundle wheel for long distances, a compass for measuring directions and clinometers for measuring angles.	Demonstrating the ability of following instructions, the ability to design and use the product, the ability to collect, record, calculate , analyse and interpret data, correct way of using different equipment to find the required measurements.
▪ Written test ▪ Assignments ▪ Home work ▪ Quiz	▪ Write a report recommending the most economical route to fly around 5 outer islands ▪ Write short answers in response to questions on interpreting features of a graph ▪ Complete a written test ▪ Perform calculations on data provided	The ability to answer questions correctly; apply correct use of formulae, units, appropriate rounding, and clear explanations of answers in the context of the question.
▪ Oral Presentation	▪ Make a verbal report on the results of a statistical investigation ▪ Explain an event or procedure in calculating an answer	The ability to make a clear introduction; clarity of voice; clear instruction; clear explanations on how to follow instructions to get to the correct answers.

8.4.3 Recording, Monitoring and Reporting

Teachers must keep all the records of the learner's marks to plan learner's future performance after recognition of their positive achievements. Learners are also diagnosed for strengths and weaknesses so that teachers can match the learning experiences to learner's needs. Recording assigns learners into groups to grade them. It also evaluates the effectiveness of teaching methods in order to structure, analyse and refine the learning experiences offered. Finally it informs learners, parents, colleagues and other professionals about the learner's achievements.

Reporting serves the purpose of giving information about the learner's performance in achieving a particular learning outcome. Reporting offers feedback to teachers and parents on the learner's performance in achieving the learning outcomes. Reporting plays an important role of keeping track of what is happening in class with the teachers and learners.

Section 9. CURRICULUM PROFILE

This section provides an overview of the time allocation to all the subjects that are taught in the secondary level. It gives the numbers of periods, length of the period that are awarded to each subject per week. With the major review that is currently on the move, the focus has been shifted from the Teacher to the Learner. What comes out at the end of the academic process as a product is apparently the main focus of the review where it is referred to as 'outcome base' approach. As a result the number of periods that are awarded to each of the practical or vocational subjects have been increased from 2 to 4 periods per week. It is anticipated that by giving more time for learners to do more practical learning will help them to acquire practical skills they would use hopefully when they leave school.

Subject	Periods per week	Period length (mins)	Total time in minutes per week	% of total timetable (1600 minutes)	Status
Academic subjects					
English	5	40	200	12.5	Compulsory assessed
Mathematics	**5**	**40**	**200**	**12.5**	**Compulsory assessed**
Science	4	40	160	10.0	Compulsory assessed
Social Studies	4	40	160	10.0	Compulsory assessed
Total Academic	***18***	***40***	***720***	***45.0***	
Practical/Vocational Subjects					
Agriculture	4	40	160	10.0	Compulsory assessed
Business Studies	4	40	160	10.0	Compulsory assessed
Home Economics/ Technology	4 main 2 subsidiary	40 40	160 80	10.0 5.0	Compulsory assessed Compulsory assessed
Total Practical/vocational	***14***	***40***	***560***	***35.0***	
Personal development subjects: Religious Studies Arts and Culture Physical Education/Health ICT	***8***	***40***	***320***	***20.0***	Compulsory assessed
Total	**40**		**1600**	**100**	

Section 10. SCOPE AND SEQUENCE

The Scope and Sequence section provides a summary of the content that must be taught in the whole three years course from Years 7 to 9 academic years. It gives an overview of the contents that must be covered in each year for the three years period for each strands and sub – strands. The arrangement of strands and sub – strands are equally important to cater for the pre-requisite learning of learners before they move on to do the next strands and sub - strands. They must understand certain concepts from certain strands to be able to do the next strands.

STRAND: NUMBERS

YEAR 7	YEAR 8	YEAR 9
7.1 Whole Numbers o Number Systems: Past and Present. o Place Value o Four Operations: +, – , x and ÷ o Order of Operations: BODMAS Rule		**9.1 Number System** o The Real Number System. o Arithmetic with Rational Numbers: Integers and Fraction / Decimals o Square and square roots o Surds: Evaluate, simplify, estimate, express and rationalise. o Add, subtract, multiply and divide surds
7.4 Length and Perimeter o Measure Lengths: Units used, Reading scales, estimates. o Conversion between lengths units o Add and Subtract of lengths o Perimeter of shapes o Ways of measurements: Past and present.	**8.2 Length and Perimeter** o Measurement of lengths o Converting units of lengths o Perimeter of polygons and special quadrilaterals o Circles: Perimeter and Circumference o Perimeter of composite shapes o Error occur in measurements	**9.2 Measurements** o Conversion of measurements units o Perimeter of Circle: Arc Length and Circumference o Area units o Area of shapes: circles and sector, Composite shapes o Total surface area of prisms, Pyramid Cylinder, cones and Spheres o Volumes: Pyramid, Cones and Spheres
	8.5 Rates and Ratio o Ratio and proportion o Simplifying Ratios o Finding quantities using ratios o Exploring ratios in triangles o Sharing using ratios o Rates: Speed, Distance and Time o Time, Distance Graphs o Scale diagrams	**9.5 Ratios and Rates** o Ratios in fraction and Simplifying o Using ratios to find quantities o Changing quantities in a given ratios o Rates in Distance, time and speed o Density o Time – distance Graph o Rates and graphs
7.3 Decimals and Percentages o Place Value and Notations o Decimals: Estimates, Add, Subtract, Divide & Multiply o Power of 10 o Fractions and Decimals o Percentages o Percentage of quantities o Calculate percentages	**8.1 Percentages** o Percent as Special Fraction: MUST out of 100 o Change of Percentages to: Fractions, decimals and vice versa. o Percentage of quantities and of another o Percentage increase or decrease o Discounts and Shopping	**9.6 Consumer Maths** o Calculations in Business o Costs in Business o Percentages o Converting percentages o Percentage of quantities o Express quantity as percentages o Profit and Loss o Commission o Wages and tax scales
	8.9 Indices o Index Numbers o Exploring Index Laws o Index Laws with algebraic terms o Managing brackets with algebra o Exploring scientific notations o Exploring exponential graphs	**9.12 Indices** o Index Numbers o Exploring Index Laws o Managing the Bracket and the Zero power o Negative Indices o Simple Fractional Indices o Standard Form

YEAR 7	YEAR 8	YEAR 9
7.14 Area and Volume o Area: Finding and comparing areas using grid and formulae o Area of polygon shapes o Volume as measure of space o Volumes of rectangular prisms o Volumes of prisms	**8.13 Area and Volume** o Using grid to find area o Area of various shapes: Rectangles, Parallelograms, Triangle, Trapezium o Area of irregular shapes o Area of circles o Area of compound shapes o Total surface area o Volume of Prism	
7.11 Time and Mass o Time Line o Time Conversions o Time and Calendar o Time in hours and minutes o Using Time Tables o Time Zones o Order of events and flow chart o Mass o Conversions of Mass Units		
7.10 Fractions o Fractions in diagrams o Mix numbers and improper fractions o Add, Subtract, Multiply and Divide in fractions o Quantities of fractions o Square and square Roots o Order of operations: BODMAS		
7.2 Number Patterns o Patterns: Nature, Objects and Numbers. o Multiples and Factors o Divisibility Test o Number Patterns: *Prime & Composite, Index Notations Squares and Square Roots Prime Factors and Odd and Even Numbers*		
7.8 Directed Numbers o Directed Numbers o Number Patterns with Directed Numbers o Comparing Directed Numbers o Addition and Subtraction of Directed Numbers o Multiplications and Division o Use of BODMAS rule in Directed Numbers o Coordinate Plane with Positive and Negative scales		

STRAND: GEOMETRY

YEAR 7	YEAR 8	YEAR 9
7.7 Angles o Angles: Names, Measure o Types of angles - Complementary angles - Supplementary angles o Draw angles using Protractor o Angles in a Circle **7.13 Polygons** o Triangles: ***Side***, ***Angle*** *and* ***Exterior angle*** *Properties* o Quadrilaterals: Angle Sum o Polygons: Angle Sum o Construct Polygons and Geometric designs	**8.3 Polygons and Parallel Lines** o Angles: Revision o Angles and Parallel Lines o Properties of Triangles o Properties of Quadrilaterals o Properties of Polygons o Exploring Geometric Bisections	**9.3 Geometry** o Angle: Review o Polygon Facts o Congruent Shapes o Similar Shapes o Exploring Similar triangles o Similar triangles o Applying Similar triangles o Exploring 3D Shapes o Undirected Graphs and Network o Planar Graphs and Euler's Formula
7.9 Coordinate Graphs and Locations o Directions in two-dimensions o Coordinate number plane o Scale diagrams and maps o Maps and bearings	**8.10 Coordinate Plane** o Plotting point on the plane o Linear Patterns and Simple Rules o Combination Rules o Plotting a line using a rule o Horizontal and Vertical Lines o Using X and Y Intercepts o Gradient of Straight Lines o Gradient and Y – Intercept o Finding Equations of Lines	**9.10 Linear Graphs** o Plotting Points on the Cartesian Plane o Plotting Straight Line Graphs o Using X and Y Intercept o Horizontal and Vertical Lines o Gradient of Straight Lines o Gradient and Y – Intercept o Find Equation of a Line
	8.7 Transformations o Transformations o Translations o Reflections o Rotations o Enlargement and Reductions o Exploring similar area and volumes o Congruent shapes	
	8.14 Polyhedra and Network o Solid Shapes o Nets for Solid Shapes o Drawing 3D Shapes o Perspective Drawings o Polyhedron Definitions o Network and their Application	

STRAND: ALGEBRA

YEAR 7	YEAR 8	YEAR 9
7.6 Algebra Symbols o Writing Expressions o Pronumerals o Multiply and Divide Pronumerals o Distributive Law o Substitute into Expression o Exploring Patterns o Rules and Formulae	**8.4 Algebra Symbols** o Algebraic Expressions o Add and Subtract Like Terms o Multiply and Divide terms o Expanding Brackets o Evaluating Algebraic Expressions o Formulas in Mathematics	**9.4 Equations and Inequations** o Simple Equations o Solve Equations using Flow Chart o Inverse Operations o Two – Three Steps Equations o Solve Equations with Brackets o Inequations o Inequalities with Negative
	8.8 Equations and Inequations o Equations o Solve Equations by Inspections o Solve Equations by Flow Chart o Solve Equations by Inverse Operations o Solve two – three Steps equations o Inequations	**9.9 Linear Equations and Formulas** o One – Step Equations: Review o Solve two – three steps Equations o Equations involve brackets o Equations o Inequations o Literal Equations o Applying Formulas o Transposing formulas

STRAND: TRIGONOMETRY

YEAR 7	YEAR 8	YEAR 9
	8.11 Pythagoras o Exploring Pythagoras Theorem o Stating the Pythagoras Theorem o Find Length of Hypotenuse o Pythagoras Triads o Find Length of Perpendicular Side o Pythagoras Theorem in Exact Form o Composite Shapes o Coordinate Geometry o Pythagoras in 3 – Dimensions o Exploring Areas of Triangles	**9.8 Trigonometry** o Labelling a Right-Angle Triangle o Exploring the Sine Ratio o Find the length of the Opposite Side o Exploring the Cosine Ratio o Find the length of the Adjacent Side o Find the Hypotenuse o Find Angles using Sine, Cosine Ratios o Using the Tangent Ratio o Angle of Elevations and Depression o Trigonometry and Bearings o Exploring Unit Circle o Exploring Trigonometric Graphs

STRAND: STATISTICS AND PROBABILITY

YEAR 7	YEAR 8	YEAR 9
7.5 Statistics o Collecting Data o Creating and Interpreting Tables o Column and Bar Graphs o Interpreting Line Graphs o Pie Graphs o Dot Plots and the Mode o The Mean o The Median and the Range o Stem and Leaf Plots o Venn Diagrams o Two – Way Tables	**8.6 Statistics** o Collecting Numerical Data o Column Graphs and Histogram o The Median, Range and Inter-Quartile Range (IQR) o Stem – and Leaf Plots o The Mean o Mean Absolute Difference o Comparing the Mean and the Median	**9.7 Statistics** o Histograms o Double Column Bar Graphs o The Mean and the Range o Cumulative Frequency o Stem Plots o BoxPlots and Measure of Spread o Exploring Sampling
7.12 Probability o The Language of Chances o Theoretical Probabilities o Exploring Simple Experiments o Using Statistics to find Probabilities	**8.12 Probability** o Exploring Set o Sets and Venn Diagram o Sets and Probability o Sample Space Grid o Tree Diagrams o Exploring a Deck of Cards o Estimating Proportion using Sampling	**9.11 Probability** o Event Space o Complementary Events o The Additional Law of Probability o Mutually Exclusive Events o Multiplication Law o Odds

An outline of the Strands and Sub – strands that are expected be taught at each different levels for the three years course. It gives the allocated times and weeks that each strands and sub – strands is expected to be taught. It also gives the sequences of how the strands and sub – strands are being arranged and the breaks that come in-between for the whole three years course.

YEAR 7

Semesters 1 and 2: 40 Weeks			
SEMESTERS	**WEEKS**	**STRANDS / SUB - STRANDS**	**ALLOCATED TIMES**
SEMESTER 1		**NUMBERS**	
	1	7.1 Whole Numbers	2 Weeks
	2		
	3	7.2 Number Patterns	2 Weeks
	4		
	5	7.3 Decimals and Percentages	3 Weeks
	6		
	7		
		MEASUREMENTS	
	8	7.4 Length and perimeter	3 Weeks
	9		
	10		
	MID	**SEMESTER**	**BREAK**
		PROBABILITY AND STATISTICS	
	11	7.5 Statistics	3 Weeks
	12		
	13		
		ALGEBRA	
	14	7.6 Algebra Symbols	3 Weeks
	15		
	16		
		GEOMETRY	
	17	7.7 Angles	3 Weeks
	18		
	19		
	20	**Mid-Year Examinations**	1 Week
MID	**YEAR**	**HOLIDAYS**	
SEMESTER 2		**NUMBERS**	
	21	7.8 Directed Numbers	3 Weeks
	22		
	23		
		GEOMETRY	
	24	7.9 Coordinate Graphs and Location	2 Weeks
	25		
		NUMBERS	
	26	7.10 Fractions	3 Weeks
	27		
	28		
		MEASUREMENTS	
	29	7.11 Time and Mass	2 Weeks
	30		
	MID	**SEMESTER**	**BREAK**
		PROBABILITY AND STATISTICS	
	31	7.12 Probability	3 Weeks
	32		
	33		
		GEOMETRY	
	34	7.13 Polygons	3 Weeks
	35		
	36		
		MEASUREMENTS	
	37	7.14 Area and Volume	3 Weeks
	38		
	39		
	40	**Final Examinations**	1 Week
END	**YEAR**	**HOLIDAYS**	

YEAR 8

Semesters 1 and 2: 40 Weeks			
SEMESTERS	**WEEKS**	**STRANDS / SUB - STRANDS**	**ALLOCATED TIMES**
SEMESTER 1		**NUMBERS**	
	1	8.1 Percentages	3 Weeks
	2		
	3		
		MEASUREMENTS	
	4	8.2 Length and Perimeter	3 Weeks
	5		
	6		
		GEOMETRY	
	7	**8.3 Polygons and Parallel Lines**	2 Weeks
	8		
		ALGEBRA	
	9	**8.4 Algebra Symbols**	2 Weeks
	10		
	MID	**SEMESTER**	**BREAK**
		NUMBERS	
	11	8.5 Rates and Ratios	3 Weeks
	12		
	13		
		PROBABILITY AND STATISTICS	
	14	8.6 Statistics	3 Weeks
	15		
	16		
		GEOMETRY	
	17	8.7 Transformation	3 Weeks
	18		
	19		
	20	**Mid-Year Examinations**	1 Week
MID	**YEAR**	**HOLIDAYS**	
SEMESTER 2		**ALGEBRA**	
	21	8.8 Equations and Inequations	2 Weeks
	22		
		NUMBERS	
	23	8.9 Indices	2 Weeks
	24		
		ALGEBRA	
	25	8.10 Coordinate Plane	3 Weeks
	26		
	27		
	28	8.11 Pythagoras	3 Weeks
	29		
	30		
	MID	**SEMESTER**	**BREAK**
		PROBABILITY AND STATISTICS	
	31	8.12 Probability	3 Weeks
	32		
	33		
		MEASUREMENTS	
	34	8.13 Area and Volume	3 Weeks
	35		
	36		
		GEOMETRY	
	37	8.14 Polyhedra and Networking	3 Weeks
	38		
	39		
	40	**Mid-Year Examinations**	1 Week
END	**YEAR**	**HOLIDAYS**	

YEAR 9

Semesters 1 and 2: 40 Weeks			
SEMESTERS	**WEEKS**	**STRANDS / SUB - STRANDS**	**ALLOCATED TIMES**
SEMESTER 1		**NUMBERS**	
	1	9.1 Number System	3 Weeks
	2		
	3		
	4	9.2 Measurement	2 Weeks
	5		
		GEOMETRY	
	6	9.3 Geometry	2 Weeks
	7		
		ALGEBRA	
	8	9.4 Algebra Skills	3 Weeks
	9		
	10		
	MID	**SEMESTER**	**BREAK**
		NUMBERS	
	11	9.5 Ratios and Rates	3 Weeks
	12		
	13		
	14	9.6 Consumer Maths	3 Weeks
	15		
	16		
		PROBABILITY AND STATISTICS	
	17	9.7 Statistics	3 Weeks
	18		
	19		
	20	**Mid – Year Examinations**	1 Week
MID	**YEAR**	**HOLIDAYS**	
SEMESTER 2		**TRIGONOMETY**	
	21	9.8 Trigonometry	3 Weeks
	22		
	23		
		ALGEBRA	
	24	9.9 Linear Equations and Formulas	2 Weeks
	25		
	26	9.10 Linear Graphs	2 Weeks
	27		
		PROBABILITY AND STATISTICS	
	28	9.11 Probability	3 Weeks
	29		
	30		
		NUMBERS	
	31	9.12 Indices	2 Weeks
	32		
	33	**NATIONAL YEAR 9 EXAMINATIONS**	
END	**YEAR**	**HOLIDAYS**	

12.1 Secondary Mathematics Year 7 Syllabus

Subject: MATHEMATICS **Year: 7**

Strand: NUMBER

Sub-strand: 7.1 WHOLE NUMBER (10 periods)
Our number system uses ten digits. The position of a digit in a number determines its value. In the system of Place Value, the digits stay in their correct positions during addition and subtraction. Multiplication is the process of adding numbers in a pattern. Division is the process of sharing equally. Estimation and simplification help to make calculation easier. Operations of numbers must be performed in the correct order – BODMAS.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
NUMBER SYSTEMS OF THE PAST **7.1.1** know that there are different number systems that have been developed by different civilisations in the past. Currently, we use the Hindu – Arabic System ***(k)***	**7.1.1.1** identify different counting systems that were used in the olden days in Solomon Islands **7.1.1.2** identify and distinguish between different number system that were used in the past including: Hindu-Arabic that we use now, Egyptian, Romans, Greeks and Chinese – Japanese	**1.** calculate the following using the 'make easy numbers' strategy. **(a)** 8 + 23 + 42 **(b)** 15 + 57 + 35 **(c)** 64 + 79 + 56 **(d)** 5 × 6 × 2 **(e)** 4 × 6 × 5 **(f)** 2 × 42 × 5 **(g)** 5 × 7 × 6 **(h)** 5 × 3 × 8 **(i)** 5 × 14 × 4
7.1.2 know how to write numbers using different number system of the past ***(k)***	**7.1.2.1** write numbers using different number system in the past: *Romans, Greeks*	**2.** rewrite each of these Roman Numerals into modern Hindu–Arabic. **(a)** XXIV **(b)** CCLV **(c)** CCCXI **(d)** CCCIX **(e)** XLV
7.1.3 know how to write and convert between number systems of the past and present and vice versa ***(k)***	**7.1.3.1** convert numbers from one counting system to another using the past and present number systems	**3.** what is the place value for the digit that is given in the bracket in the given numbers. **(a)** 45 783 (8) **(b)** 1 264 184 (2)
PLACE VALUE **7.1.4** understand that our number system is "Base 10" and are made up of the following digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 ***(u)***	**7.1.4.1** write and express numbers in figures using digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9, and also in words	**4.** rearrange the following numbers in ascending order. 567, 4500, 0, 74, 11,100, 6,008, 12, 602
7.1.5 understand that a position of individual digits in a number holds different values and names ***(u)***	**7.1.5.1** identify the names and values of numbers in respect to the positions of the digits in the Place Value Table **7.1.5.2** arrange numbers in ascending and descending order according to their values.	
ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION **7.1.6** know how to compute with numbers using Addition, Subtraction, Multiplication and Division ***(k)***	**7.1.6.1** use the four (4) basic operations: *Addition, Subtraction, Multiplication* and *Division* to compute and solve whole number problems	

Subject: MATHEMATICS	Year: 7	
Strand: NUMBER		
Sub-strand: 7.1 WHOLE NUMBER (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
DOUBLE AND HALVING (Calculation Short Cuts) **7.1.7** know how to evaluate numbers using 'Doubling and Halving' method ***(k)***	**7.1.7.1** use the doubling and halving techniques to calculate and evaluate number problems	**5.** Jessica earns $5 every time she walks her neighbour's dog. If she walks the dog 3 times a week, how much will she earn in 6 months?
ORDER OF OPERATIONS **7.1.8** know how to use 'Rule of – BODMAS to solve and evaluate problems that have mixture of operations ***(k)***	**7.1.8.1** apply the Order of Operation Rule [BODMAS] when performing Number Calculations	**6.** Alicia is ordering stationery for her office cupboard. Calculate the cost of each of the following, in dollars. **(a)** 8 notepads at 98 cents each **(b)** 3 gluesticks at 77 cents each **(c)** 12 pens at 59 cents each **(d)** 5 boxes of paperclips at 82 cents each
ESTIMATION **7.1.9** know how to estimate numbers to the nearest whole numbers (ones), tens, hundreds etc ***(k)***	**7.1.9.1** round-off numbers to the nearest Ones, Tens, Hundredths, Thousands	

Subject: MATHEMATICS **Year: 7**

Strand: NUMBER

Sub-strand: 7.2 NUMBER PATTERNS (10 periods)
Numbers form Patterns. There are patterns of Odd and Even numbers, factors of numbers, multiple of numbers, prime and product of prime factors. There are divisibility tests for finding factors of numbers. Finding common multiple factors, prime factors, squares and square roots are essential numerical skills. Multiplying a number by itself several times can be expressed using index notation. There are index laws for multiplication and division of number expressed as powers.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPLORING NUMBER PATTERNS **7.2.1** understand that patterns can be found in everywhere; in nature and other objects. Some patterns occur in natural settings ***(u)***	**7.2.1.1** identify patterns that can be found in natural settings around our environment	**1.** list the common multiples and then state the lowest common multiple of the following: **(a)** 2 and 5 **(b)** 3 and 4 **(c)** 7 and 9 **(d)** 6 and 7
7.2.2 know how to use objects and numbers to create patterns ***(k)***	**7.2.2.1** create patterns using sticks, stones, and numbers: - *Rectangles, Square* and *rectangle* numbers **7.2.2.2** identify and complete patterns with numbers and dots, etc	**2.** find the highest common factor of the following pairs of numbers. **(a)** 48 and 30 **(b)** 15 and 30 **(c)** 14 and 27 **(d)** 13 and 52 **(e)** 40 and 32 **(f)** 40 and 50 **(g)** 30 and 60 **(h)** 48 and 144
MULTIPLES AND FACTORS **7.2.3** know how to find multiples, common multiples, lowest and highest common multiple of numbers ***(k)***	**7.2.3.1** find multiples of numbers and factors by identifying the patterns they created **7.2.3.2** find the common multiples, lowest and highest common multiples of given numbers	**3.** complete the following sentences by using the words 'multiple' 'factor' or 'divisible'. **(a)** 32 is a multiple of 8 because it is _____ by 8. **(b)** 6 is a _____of 54, so 54 is a multiple of 6. **(c)** 72 is divisible by 9, so that makes it a _____of 9. **(d)** 4 is a factor of 60, so 60 is_____by 4.
7.2.4 know how to find factors, common factors, lowest and highest common factors of numbers ***(k)***	**7.2.4.1** find factors of numbers identifying the patterns they created **7.2.4.2** find common factors, lowest and highest common factors of given numbers	
DIVISIBILITY TEST **7.2.5** know how to apply 'divisibility tests' to numbers to find factors ***(k)***	**7.2.5.1** identify and find other factors with no remainders using the 'Divisibility Test'	**4.** if 24 mangoes are placed into bags so that each bag containsthe same number, how many mangoes can be in each bag?List all possible answers.
EXPLORING PRIME AND COMPOSITES **7.2.6** recognise 'Prime Numbers' and 'Composite Numbers' and how they are distinguished between them ***(s)***	**7.2.6.1** define Prime and Composites numbers **7.2.6.2** identify prime and composite numbers **7.2.6.3** solve prime and composite number probles	
INDEX NOTATION **7.2.7** understand the make – up of an Index Notation Number which has a ***Base*** and ***Power*** ***(u)***	**7.2.7.1** identify parts of an Index Number: Base → a^3 ← Index number	

Subject: MATHEMATICS	Year: 7	
Strand: NUMBER		
Sub-strand: 7.2 NUMBER PATTERNS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
7.2.8 know that the 'index number (power) indicates how many times a number is to bemultiplied by itself ***(k)***	**7.2.8.1** identify the 'Index Number or Power' and its purpose or function. *Index Number or Power' indicates how many times a number is multiplied by itself*	**5.** write the prime numbers between 1 and 20. **6.** how many single-digit prime numbers are there? List them.
7.2.9 know how to express and evaluate numbers in the index notation ***(k)***	**7.2.9.1** express numbers in 'Index Notation' **7.2.9.2** evaluate index number problems using BODMAS rule	**7.** list all the primes between 20 and 60.
SQUARES AND SQUARE ROOTS **7.2.10** recognise Square and Square Roots and how they are distinguished between them ***(s)***	**7.2.10.1** define square and square roots **7.2.10.2** evaluate numbers by squaring them **7.2.10.3** evaluate numbers by taking their square roots	**8.** to find the prime factors of a number, Ray uses the divisibility tests. He then writes down the number from each divisibility test that worked. **(a)** using this method, what would Ray say are the prime factors of 20? **(b)** what is wrong with Ray's method?
PRIME FACTORS **7.2.11** understand that a composite number can be expressed and written as a product of its prime factors ***(u)***	**7.2.11.1** define Prime Factors **7.2.11.2** Write composite numbers as product of their prime factors **7.2.11.3** construct a factor tree to express a composite number as a product of its prime factors	
ODD AND EVEN **7.2.12** understand how to determine and identify 'odd numbers' and 'even numbers' ***(u)***	**7.2.12.1** define Odd and Even numbers **7.2.12.2** identify and list Odd and Even numbers and solve odd and even numbers problems	

Subject: MATHEMATICS **Year: 7**

Strand: NUMBER

Sub-strand: 7.3 DECIMALS AND PERCENTAGES (15 periods)
The sub-strand revises the expressions of decimals numbers using place value; the techniques of estimating using the rule for 'rounding-off' decimal numbers. Computing with Addition, Subtraction, Multiplication and Division are also covered. Multiplication and Division of decimal numbers by 'whole numbers' and by 'decimal numbers' are covered. The sub-strand focuses on the movement of the decimal point when dividing and multiplying decimal numbers. It covers conversions of fractions to decimals and vice versa with the multiplications and divisions of numbers with the powers of 10.

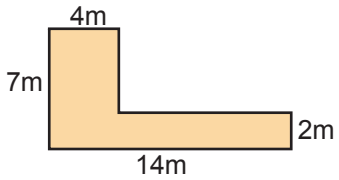
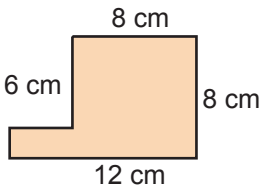
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
PLACE VALUE AND NOTATION **7.3.1** understand that digits in numbers: *whole numbers and decimal numbers,* hold different values which determine by their position in a given number ***(u)*** **7.3.2** know that Decimal Numbers are numbers that are smaller than one (1) and are placed after the decimal point to the right ***(k)*** **7.3.3** know how to determine the values of individual digits in given numbers ***(k)***	**7.3.1.1** Identify different names given to different columns of the Place Value Table with their corresponding values **7.3.2.1** identify decimal numbers and place them accordingly into the Place Value Table **7.3.3.1** determine values of individual digits in numbers and compare their values	**1.** lime is spread on a farm at a tonne per hectare. **(a)** If the Nollan have 16 hectares, how much lime do they need? **(b)** Brenda has 26 hectares, how much lime does she need to spread? **(c)** the Betikama farm has 18 hectares, how much lime do they require for their property?
ESTIMATION AND ROUNDING-OFF DECIMAL NUMBERS **7.3.4** know how to estimate decimal numbers and Evaluate them using the Four Operations: +, -, x, ÷ ***(k)*** **7.3.5** know how to round-off decimal numbers to any given specified limits ***(k)***	**7.3.4.1** estimate decimal numbers by rounding them off to given decimal places **7.3.5.1** round-off decimal numbers to the nearest specified decimal place/s	**2.** write each of the following in expanded word form. **(i)** 5.2 **(ii)** 4.9 **(iii)** 34.17 **(iv)** 0.61 **(v)** 2.794 **(vi)** 7.5092 **(vii)** 35.865 43 **(viii)** 0.820 027 **3.** write down at least six numbers between 4.5 and 4.7. **4.** round the following decimals to the number of decimal places shown in brackets.
ADDING AND SUBTRACTING DECIMALS **7.3.6** know how to add and subtract decimal numbers ***(k)***	**7.3.6.1** add and subtract decimals numbers by placing digits in their right places **7.3.6.2** solve practical decimal problems	**(a)** 4.88 (1) **(b)** 6.72 (1) **(c)** 7.635 (2) **5.** round the following amounts of money to the nearest 5 cents.
MULTIPLICATION AND DIVISION OF DECIMAL NUMBERS **7.3.7** know how to multiply and divide decimal numbers ***(k)***	**7.3.7.1** evaluate decimal numbers by multiplying and dividing decimal numbers by: - whole numbers - decimal numbers	**(a)** \$4.52 **(b)** \$2.76 **(c)** \$11.03 **(d)** \$23.88 **6.** calculate each of the following percentages. **(a)** 50% of \$36 **(b)** 10% of 450 m **(c)** 20% of 840 L

Subject: MATHEMATICS	Year: 7	
Strand: NUMBER		
Sub-strand: 7.3 DECIMALS AND PERCENTAGES (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPLORING POWER OF 10 **7.3.8** understand how decimal numbers are multiplied and divide by 10 and powers of 10 ***(u)***	**7.3.8.1** multiply and divide decimal numbers by 10, 100, etc..., moving the decimal point to the RIGHT **7.3.8.2** evaluate by multiplying and dividing whole numbers and decimal numbers by 10 and powers of 10	**7.** write the following as percentages. Round your answers to one decimal place, if necessary. (a) 17 out of 20 on a spelling quiz. (b) 5 out of 22 students in the class have blond hair. **8.** there are 11 boys and 15 girls in class 7B. Write the number of boys and the number ofgirls as percentages of the total number of students in the class.
FRACTIONS AND DECIMALS **7.3.9** know how to change fractions to decimals ***(k)***	**7.3.9.1** change fraction to decimal by dividing the numerator by the denominator	
CONVERT DECIMAL TO FRACTION **7.3.10** know how to convert decimals to fractions ***(k)***	**7.3.10.1** change decimal number to fraction. Count the decimal numbers and replace them with zero to indicate the total parts of the denominator	
PERCENTAGES **7.3.11** understand that 'Percentage' is a term given to describe a special fraction, where the denominator is and MUST always be out of 100 ***(u)***	**7.3.11.1** define Percentage **7.3.11.2** identify percent and its properties	
7.3.12 know how to convert Percentages to fractions and vice versa ***(k)***	**7.3.12.1** convert Percentages to Fractions **7.3.12.2** convert Fractions to Percentages	
FINDING PERCENTAGES OF QUANTITIES **7.3.13** know how to find Percentages of Quantities ***(k)***	**7.3.13.1** finding the percentage of given quantities	
CALCULATING PERCENTAGES **7.3.14** know how to use Percentages to solve and evaluate problems involving percentages ***(k)***	**7.3.14.1** olve and evaluate practical problems using percentages	

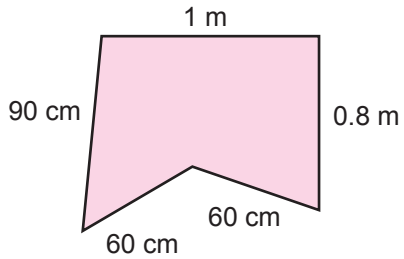
Subject: MATHEMATICS **Year: 7**

Strand: MEASUREMENTS

Sub-strand: 7.4 LENGTH AND PERIMETER (15 periods)
The sub – strand deals with the selection and use of appropriate metric units for the measurement of lengths; calculation and measurements of perimeter; methods of estimating objects too big, or too small for individual measurement; conversion between metric units; use of map scale to calculate distances on the ground; accurate use of measurements scales; making sensible estimates of lengths of everyday objects.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
UNITS USED TO MEASURE LENGTHS **7.4.1** understand that there are standard metric units for lengths and distances ***(u)***	**7.4.1.1** identify common Metric Units that are used to measure lengths and distances: [*millimetre (mm), centimetre (cm), metre (m), Kilometres (km)*]	**1.** copy and complete the following conversions. **(a)** 5 km = m **(b)** 3.6 km = m **(c)** 0.008 km = m **(d)** 65 m = cm **(e)** 0.55 m = cm **(f)** 1.2 m = cm **(g)** 2.9 cm = mm **(h)** 6.1 cm = mm **(i)** 0.35 cm = mm
7.4.2 know how to identify appropriate metric units that would correspond to certain lengths and distances ***(k)***	**7.4.2.1** identify appropriate metric units that would go along with given lengths Eg: Centimetres best for small lengths, kilometres best for long distances	**2.** state which metric unit would be most appropriate for measuring. **(a)** the length of your foot **(b)** the distance from Honiara to Bellona **(c)** the distance around an athletics track (d) the length of a shoelace
ESTIMATE BY USING KNOWN VALUES AND LENGTHS **7.4.3** understand how to make sensible estimates of lengths and perimeter by making comparison to known values and information ***(u)***	**7.4.3.1** estimate the lengths and distances of given objects by comparing the measurements of given objects	**3**. find the perimeter of each of these shapes. **(a)** 
ESTIMATING LENGTHS **7.4.4** know how to estimate lengths and sizes of objects even with distracting lines or designs around them ***(k)***	**7.4.4.1** estimate lengths and sizes of objects even with distracting lines or designs around them	
READING SCALES AND LENGTHS WHEN MEASURING **7.4.5** Know how to read scales from measuring instruments and use it to measure lengths accurately ***(k)***	**7.4.5.1** read scales on measuring instruments and use it to measure lengths of lines, objects accurately	**(b)** 
MEASURING LENGTHS ACCURATELY **7.4.6** know how to accurately measure objects using appropriate measuring instrument ***(k)***	**7.4.6.1** use rulers to accurate measure Lengths, objects, distances and lines	

Subject: MATHEMATICS	Year: 7
Strand: MEASUREMENTS	
Sub-strand: 7.4 LENGTH AND PERIMETER (15 periods)	

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
CONVERTING LENGTH UNITS **7.4.7** know that lengths of objects can be change from one metric unit to another ***(k)***	**7.4.7.1** change metric units of lengths from one to another	**4.** the perimeter of a rectangle with a length of 25 cm and a width of 10 cm is.
7.4.8 know how to convert from one metric unit to another ***(k)***	**7.4.8.1** use conversion factors to change one metric unit to another: *1 cm =10 mm, 1m = 100 cm,1 km = 1000 m*	**5.** calculate the perimeter of each of the following, first converting side lengths to the smaller unit when necessary.
ADDITION AND SUBTRACTION OF LENGTHS AND DISTANCES **7.4.9** know how to add and subtract lengths and distances ***(k)***	**7.4.9.1** add and subtract lengths and distances using appropriate metric units	
PERIMETER OF SHAPES WITH STRAIGHT SIDES **7.4.10** understand that the perimeter of a shapes is the distance all around it ***(u)***	**7.4.10.1** define Perimeter **7.4.10.2** identify the perimeter of given shapes and objects	
7.4.11 know how to measure and calculate the perimeter of given shapes and object ***(k)***	**7.4.11.1** calculate perimeter of shapes and objects with straight sides	**6.** a group of phys. ed. students run around the perimeter of a court in their gymnasium, which is rectangular and has dimensions 38 m by 16 m. What distance will they run if they complete 6 laps?
EXPLORING MEASUREMENT IN THE PAST **7.4.12** understand that there are different methods of measurements that were used in the past civilization ***(k)***	**7.4.12.1** identify some of the methods that were used in the past civilization for measurements	**7.** estimate the perimeter of each of the following objects.
7.4.13 know how to choose appropriate units for measurements in the past ***(k)***	**7.4.13.1** choose appropriate units that can be used to measure lengths and objects in the past	**(a)** a 30 cm ruler **(b)** your desk **(c)** a basketball court

Subject: MATHEMATICS **Year: 7**

Strand: PROBILITY AND STATISTICS

Sub-strand: 7.5 STATISTICS (15 periods)
Statistics is basically the collection, organization, presentation and interpretation of information in numerical form, about a population or a sample population. There are specific methods that are used in handling data; From the collection of data, to counting through the use of frequency tables, to the constructions of graphs to represent the information and lastly interpreting those graphs. Mode, mean, median and range are used to measure central tendency and dispersion of given data about a population or sample population.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
COLLECTING DATA **7.5.1** understand statistics and how information (data) are being collected and represented ***(u)***	**7.5.1.1** define statistics **7.5.1.2** identify ways of collectingdata: *Questionnaire, Polls and Surveys*	**1.** for each of the following, state whether the data from a survey asking these questions is categorical, discrete or continuous.
7.5.2 Know that data that are collected are grouped into 2 types ***(k)***	**7.5.2.1** identify two types of data that can be collected **7.5.2.2** define and differentiate between *Discrete* and *Continuous data*	**(a)** how do you travel to school? **(b)** what colour hair do you have? **(c)** how much time did you spend at the beach last summer?
7.5.3 know how to tabulate collected data into a Frequency Table ***(k)***	**7.5.3.1** tabulate collected data into frequency table **7.5.3.2** solve word problems	**2.** a Year 7 class of 25 students was surveyed about the number of pets they own. The results were: 0, 0, 2, 1, 1, 1, 0, 6, 9, 4, 3, 0, 1, 3, 2, 1, 1, 4, 5, 4, 3, 2, 1, 4, 7
CREATING AND INTERPRETING TABLES **7.5.4** know that the simplest and easiest way to display and interpret data is to put them into tables ***(k)***	**7.5.4.1** read and interpret data that are given in a table **7.5.4.2** construct tables to display collected data	**(a)** construct a frequency table showing this information. **(b)** is this data categorical, discrete or continuous?
COLUMN AND BAR GRAPHS **7.5.5** know that another way of displaying data are Bar Graphs and Column Graphs ***(k)***	**7.5.5.1** define and differentiate Column and Bar graphs **7.5.5.2** construct column and bar graphs to represent the collected data	**3.** a die is rolled 20 times. Construct a possible frequency table for the outcomes 1, 2, 3, 4, 5, 6 with no outcome having a frequency greater than 4.
7.5.6 Know how to interpret bar and column graphs ***(k)***	**7.5.6.1** interpret given bar and column graphs to get extra information	**4.** find out the favourite school subject of each of the students in your class by surveying your class. Construct a frequency table of your results.
INTERPRETING LINE GRAPHS **7.5.7** know that graphs can be used to get real and visual information about life ***(k)***	**7.5.7.1** interpret and get information from data summarized in line graphs	**(a)** what is the favourite subject of the members of your class? **(b)** what is the second favourite subject of the members of your class?
PIE GRAPHS **7.5.8** understand how Pie Graph is used to display collected categorical data ***(u)***	**7.5.8.1** read and interpret data collected and represented by pie graphs	
7.5.9 know how to construct Pie Graphs ***(u)***	**7.5.9.1** construct Pie Graphs by converting data collected into number of degrees	

Subject: MATHEMATICS Year: 7		
Strand: PROBILITY AND STATISTICS		
Sub-strand: 7.5 STATISTICS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
DOT PLOTS AND THE MODE **7.5.10** understand that Dot Plots are pictorial way of displaying discrete numerical data ***(u)*** **7.5.11 k**now how to use those dot plots to find the Modal score ***(k)*** **THE MEAN** **7.5.12** understand that Mean is the measurement of the Centre of a set of scores ***(u)*** **THE MEDIAN AND THE RANGE** **7.5.13** understand that Median is the middle number when the set of scores are arranged in ascending or descending order ***(u)*** **7.5.14** know Range as the difference between the highest and the lowest score (k) **STEM – AND – LEAF PLOTS** **7.5.15**understand how Stemplots can be used to plot *'two – numerical'* data using **Tens** for stem and **Ones** for leaves ***(u)*** **7.5.16** know how to use Stem – and – leaf plots to tabulate and display data ***(k)*** **VENN DIAGRAMS** **7.5.17** understand how Venn Diagram can be used to classify and display data or elements ***(u)*** **7.5.18** understand that some of the elements That are given in a Venn Diagram can be classified or appeared in both circles (u) **TWO – WAY TABLES** **7.5.19** know how Two – Way tables can be used to display Categorical data ***(k)***	**7.5.10.1** identify Dot Plots graphs **7.5.10.2** display given data as a dot plot and identify their frequencies **7.5.11.1** find the mode for a set of scores using dot plots **7.5.11.2** interpret and analyse dot plot graphs **7.5.12.1** define and identify mean **7.5.12.2** find the mean of set of scores **7.5.12.3** compare set of scores using mean from the set of scores **7.5.13.1** define Median and Range of set of scores **7.5.13.2** find the median of a set of score **7.5.14.1** find the range of the set of scores **7.5.15.1** find median and range using stemplot **7.5.16.1** tabulate and display information (data) using stem – and – leaf format **7.5.17.1** identify different parts of the Venn Diagram **7.5.17.2** interpret and analyse data that are given in Venn Diagram **7.5.18.1** identify elements that are shared and classified in both circles which appear in the Intersection area of the Venn Diagram **7.5.19.1** read information from Two-way tables and Construct two-way tables display categorical data	**5.** find the (i) mean, (ii) median and (iii) mode of each of the following sets of test results. **(a)** 7, 1, 7 **(b)** 5, 8, 5 **(c)** 6, 6, 6, 6, 6 **(d)** 4, 4, 4, 4, 4, 4, 4 **(e)** 7, 6, 7, 5, 7, 9, 7, 8 **(f)** 6, 5, 5, 5, 9, 9, 10 **6.** find the (i) mean, (ii) median and (iii) mode of each of the following sets of data. Round your answers to two decimal places if necessary. **(a)** 29, 36, 29, 23, 32, 25 **(b)** 67, 73, 72, 82, 50, 45, 76

Subject: MATHEMATICS **Year: 7**

Strand: ALGEBRA

Sub-strand: 7.6 ALGEBRA SYMBOLS (15 periods)

By using symbols (pronumerals) to represent unknowns, algebra enables us to solve problems by writing information as mathematical sentences or statements. These statements are expressions. Expressions are made up of terms which can be simplified by collecting like terms. The distributive law states that a 'term outside a bracket in an expression, multiplies each term inside the bracket. Expressions are evaluated by substituting numbers into expressions in a correct sequence. A formula explains a process for working out a result, when an expression is connected to a symbol by an equal sign (Example: P = 2L + 2W gives the perimeter of a rectangle). Formulae are worked out by substituting values for the variable or pronumerals.

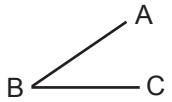
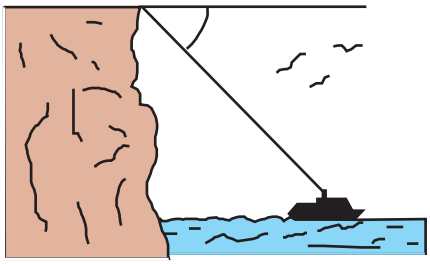
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
WRITING EXPRESSIONS **7.6.1** understand that algebra is part of maths where verbal statements of problems are expressed using mathematical symbols ***(u)***	**7.6.1.1** define Algebra **7.6.1.2** define Terms and Expressions	1. write an expression for the following statements: **(a)** a numbernis multiplied by five then four is added. **(b)** a numberxis divided by three then two is subtracted. **(c)** a numberyis multiplied by 3 and six is added. **(d)** a numberpis halved and thirty is added
7.6.2 know how to express verbal statements as mathematical expressions ***(k)***	**7.6.2.1** translate maths problems statements into algebra expressions by using symbols and objects.	
7.6.3 understand that symbols in an algebraic expressions can be simplified by grouping the same symbols together ***(u)***	**7.6.3.1** use symbols, pronumerals and other objects to create maths expressions by grouping same symbols, pronumerals and objects together	**2.** write the following situations using algebra. **(a)** there are p books in Jacob's locker. How many are left after Jacob takes out three for class? **(b)** There are v chocolates in one box. How many chocolates are there in 12 identical boxes?
PRONUMERALS **7.6.4** know that letters are being used as pronumerals to represent missing values in an expression ***(u)***	**7.6.4.1** define pronumerals and variables **7.6.4.2** use letters to represent missing numbers	
7.6.5 know how to group or put together same letters or objects ***(u)***	**7.6.5.1** simplify expression by matching and grouping objects, symbols of the same kind	**3.** write each of the following using algebra. **(a)** the sum of x and 2. **(b)** the product of 4 and y. **(c)** t is subtracted from 5. **(d)** the quotient when k is divided by d
MULTIPLYING AND DIVIDING PRONUMERALS **7.6.6** know how to simplify expressions by multiplying them ***(u)***	**7.6.6.1** simplify expressions by multiplying those algebraic terms	**4.** Nelly has 7 bags with x lollies in each bag, plus 9 extra lollies. The total number of lollies Nelly has altogether can be written using algebra as.
7.6.7 know how to simplify algebra expressions by dividing them ***(u)***	**7.6.7.1** simplify expressions by dividing those algebraic terms	**5.** the sum of z and 6 is divided by 2. When written using algebra it is: **6.** what is the cost of buying b movie tickets, at v dollars per ticket?

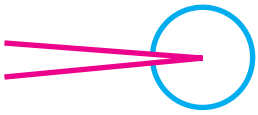
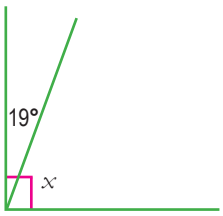
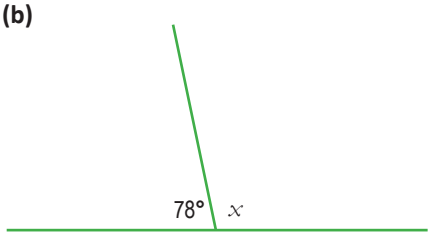
Subject: MATHEMATICS	Year: 7	
Strand: ALGEBRA		
Sub-strand: 7.6 ALGEBRA SYMBOLS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
DISTRIBUTIVE LAW **7.6.8** know how to apply " Distributive Law" to algebraic expressions which can be expanded by removing brackets ***(u)***	**7.6.8.1** use the 'Distributive Law' to expand expressions with brackets Example: a (b + c) = ab + ac	**7.** for each of the following: **(i)** state whether it is an equation or an expression **(ii)** identify the coefficient of x **(iii)** list all the variables **(iv)** write down any constants **(v)** list all the terms used. (a) $2x + 3y - 7 + 4x^2$ (b) $32 - 4x = 3xy + 4z$ (c) $2xy - 3x^2 = 9 - 23x$ (d) $6 - x + 8y - 4xy$
SUBSTITUTE INTO EXPRESSION **7.6.9** understand that when values are substituted into an expression it is evaluated to give a result ***(u)***	**7.6.9.1** evaluate algebraic expressions by substituting values into variables in the expressions	
EXPLORING PATTERNS **7.6.10** know how to create patterns using dots and match sticks ***(u)***	**7.6.10.1** create triangular, squares and pentagonal shape patterns with dots and match sticks	
RULES AND FORMULAE **7.6.11** understand that when an equal sign is used in an expression the result becomes a 'result' ***(u)***	**7.6.1.1** use rules and formulas to evaluates and solve for missing numbers represented by pronumerals Example: $P = 2L + 2W$ (U)	

Subject: MATHEMATICS **Year: 7**

Strand: GEOMETRY

Sub-strand: 7.7 ANGLES (15 periods)
The convention used to describe anything which turns through a full circle is "degrees of a turn" up to a maximum of 360^0. Line segments meeting at a point form 'angles.' Degrees of a turn express the size of such angles. Angles are classified according to the degrees of a turn they represent. Geometry instruments are used to measure and construct angles. Angles are mathematical tool used in construction work, engineering, navigation and design.

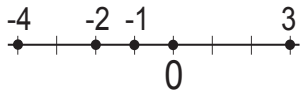
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
NAMING ANGLES **7.7.1** understand that angles are formed when two lines meet at a point ***(u)*** **7.7.2** know how to name angles by using alphabetical letters to represent where line segments meet ***(k)***	**7.7.1.1** identify the vertex of an angle **7.7.2.1** draw and name angles using alphabetical letters such as ∠ABC 	**1.** use your protractor to draw the following reflex angles. Ensure that they are correctly labelled. **(a)** *Angle M = 185°* **(b)** *Angle d = 197°* **(c)** *Angle XYZ = 205°* **(d)** *Angle F = 214°* **(e)** *Angle h = 224°* **(f)** *Angle ABC = 239°*
TYPES OF ANGLES **7.7.3** understand that angles are group together according to their sizes ***(u)*** **7.7.4** know how to classify angles according to their sizes ***(k)***	**7.7.3.1** group angles together and given them names according to the amount and sizes of degrees they have **7.7.4.1** identify different types of angles and give their names according to their sizes *Acute angle, Right angle, Obtuse angle, Straight line angle, Reflex angle and Perigon or Full circle*	**2.** Stephanie was cutting up her pizza when she noticed that she had formed four adjacent angles. **(a)** measure the four angles that Stephanie has created **(b)** what is their sum? **(c)** what do you notice about the opposite angles?
MEASURING OF ANGLES **7.7.5** know how to measure angles with protractors ***(k)*** **USING PROTRACTOR TO DRAW ANGLES** **7.7.6** know how to construct angles of any size using a protractor ***(k)***	**7.7.5.1** use a protractor to measure given angles in degrees **7.7.6.1**use a protractor to draw angles of any sizes	**3.** in the diagram, estimate the angle shown from the top of the cliff to the ship and then measure the angle with your protractor. 
COMPLEMENTARY ANGLES **7.7.7** understand that angles have properties to identify them ***(u)*** **7.7.8** know how find to missing angles represented by pronumerals using properties of complementary angle ***(k)***	**7.7.7.1** define and identify 'Complementary (Adjacent) angles.'*Complementary angles*: *- angles that stay next to each other (adjacent) and add to 90^0 (degrees)* **7.7.8.1** use the properties of complementary angles to find the size of missing angles represented by the pronumerals	

Subject: MATHEMATICS	Year: 7	
Strand: GEOMETRY		
Sub-strand: 7.7 ANGLES (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
SUPPLEMENTARY ANGLES **7.7.9** know how to identify Supplementary angles ***(k)***	**7.7.9.1** define Supplementary angle: *Supplementary Angles – angles that stay next to each other and add to 180⁰ (degrees)*	**4.** state the type of angle shown in each case. **(a)** **(b)** 
7.7.10 know how find to find missing angles that are represented by variable ***(k)***	**7.7.10.1** use the properties of Supplementary angles to find the size of missing angles represented by the pronumerals	
ANGLES IN A CIRCLE **7.7.11** know that there are 360⁰ in a full turn and is called Perigon ***(k)***	**7.7.11.1** find the total number of degrees in a full turn or Perigon	**5.** classify the following angles (acute, obtuse, right etc.). **(a)** 23° **(b)** 117° **(c)** 275° **(d)** 360° **(e)** 180° **(f)** 75°
7.7.12 know how to find missing angles represented by pronumerals in a full or complete turn ***(k)***	**7.7.12.1** find the sizes of missing angles represented by letters	**6.** find the size of angle x in each diagram. **(a)**  **(b)** 

Subject: MATHEMATICS **Year: 7**

Strand: NUMBERS

Sub-strand: 7.8 DIRECTED NUMBERS (15 periods)
Directed numbers indicate both the 'size' and the 'direction'. A number line displays the directed numbers: Negative on to the LEFT of Zero and Positive numbers on to the RIGHT of Zero. The number line can represent inequalities expressed using the Less than (<) or the Greater than (>) signs. Addition and Subtraction of directed numbers can be represented on the number line. Multiplication and Division of directed numbers are subject to the rules for the signs of the product and dividend The correct order of operations must be applied to directed number. In the Cartesian number plane y axis is the vertical line and x – axis is the horizontal line crossing at zero. The plane shows Positive and Negative in two dimensions. The plane can be used to represent ordered pair of *x* and *y* *coordinates* – the x coordinate always presented *first* with y would always *second* as in (+4, - 3) meaning (+4) on the x – axis and (– 3) on the y – axis.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
DIRECTED NUMBERS **7.8.1** understand that Directed Numbers indicate both the **magnitude** (size) and **direction** of the number ***(u)***	**7.8.1.1** define and identify Directed Numbers **7.8.1.2** construct Number Line with Positive Numbers **7.8.1.3** extend the number line to have both the negative and positive numbers	**1.** use the number line given to find answers to given questions 
7.8.2 know how to describe the positions of various objects using a number line which has negative and positive numbers on the scales ***(k)***	**7.8.2.1** indicate and identify the positions of various objects and letters that are given on the number line	**(a)** Which of the given value is bigger? i. – 4 or 2 ii. 0 or – 2
NUMBER PATTERNS **7.8.3** understand that number pattern can be created using directed numbers ***(u)***	**7.8.3.1** identify number patterns are created using the positive and negative	**(b)** Why is positive 2 bigger than – 4?
7.8.4 know how to create numbers using the negative and positive numbers ***(k)***	**7.8.4.1** create patterns using positive and negative numbers	**2.** John has $8 and is then given $6 pocket money so that altogether he has $14. Is $14 a positive or negative value? Why?
COMPARING DIRECTED NUMBERS **7.8.5** understand that Inequality signs such as greater and less than signs [(<) and (>)] are used to make comparison between values of numbers ***(u)***	**7.8.5.1** use inequality signs < and > to compare numbers and place them on the number line	
7.8.6 know how to use those inequality signs to make those statement true or false ***(u)***	**7.8.6.1** insert inequality signs, < and > to make statement either true or false.	
7.8.7 know how to compare values of directed numbers and arrange in ascending and descending order ***(k)***	**7.8.7.1** arrange numbers from small to big and vice versa	

Subject: MATHEMATICS	Year: 7
Strand: NUMBERS	
Sub-strand: 7.8 DIRECTED NUMBERS (15 periods)	

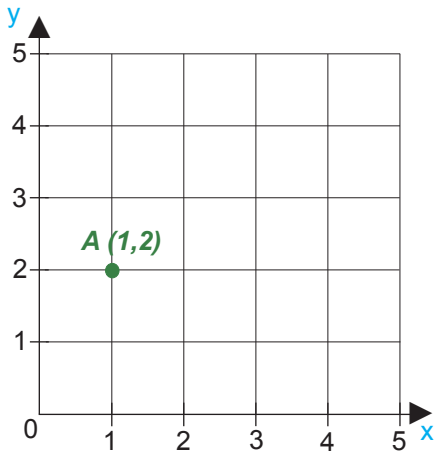
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	*Learners should be able to*	*Learners can be assessed on*
ADDITION & SUBTRACTION **7.8.8** know how to use the number line to Add and Subtract directed numbers ***(k)***	**7.8.8.1** add and subtract directed numbers using number line, "add on" or "take away" for both positive and negative values **7.8.8.2** use the rules " like signs give Positive (+) " and "unlike signs give negative (–) " to add and subtracting directed numbers	**3.** simplify the following by writing a single sign between the two numbers, then calculate the answer. **(a)** +4 + (+9) **(b)** -7 + (+5) **(c)** +5 + (+3) **(d)** +2 − (+6) **4.** simplify the following by writing a single sign between the two numbers, then calculate the answer.
MULTIPLICATION AND DIVISION **7.8.9** know how to apply the positive and negative signs: when multiplying and dividing directed numbers ***(k)***	**7.8.9.1** multiply and divide directed numbers using the rules;" Like Signs give Positive " " Unlike signs give Negative "	**(a)** +5 + (-4) **(b)** +7 + (-9) **(c)** +5 − (-11) **(d)** -7 − (-6) **5.** write a negative or a positive integer to describe the following situations.
ORDER OF OPERATION **7.8.10** understand how to apply the rule of BODMAS to solve problems that involved mixture of operations (+, -, x, ÷) ***(u)***	**7.8.10.1** solve directed number problems applying the rule of BODMAS	**(a)** 350 m above sea level **(b)** a loss of $4800 **6.** place the following in descending order (largest to smallest).
MISCELLANEOUS DIRECTED NUMBERS **7.8.11** know how to solve and evaluate Directed Number problems ***(k)***	**7.8.11.1** evaluate and solve different Directed Number problems using number line, BODMAS and other approaches	**(a)** +4, 0, -7, +11, -2 **(b)** -23, 1, 0, -9, +7 **(c)** -3, 4, 0, 11, -15, 1 **(d)** -5, 8, 19, -43, -2, 6
COORDINATE PLANE **7.8.12** know that coordinate plane is a 2 dimensional number line ***(k)***	**7.8.12.1** identify two sides of the plane and name the axes	**7.** calculate:
7.8.13 know how to find the coordinates of the positions of objects on the coordinate plane using the x and y axes ***(k)***	**7.8.13.1** find the coordinates of objects on the coordinate plane using the x and y axes	**(a)** -2 × -4 × 3 **(b)** -1 × 3 × -4 **(c)** 3 × -5 × -1 **(d)** 4 × 5 × -2 **(e)** -9 × 1 × 2 **(f)** 8 × -1 × 3
7.8.14 know how to plot coordinate pairs on a set of x and y axes coordinate plane ***(k)***	**7.8.14.1** plot coordinate pairs on a set of x and y axes	**8.** calculate: **(a)** $(-6)^2$ **(b)** -6^2 **(c)** $(-10)^2$ **(d)** -10^2

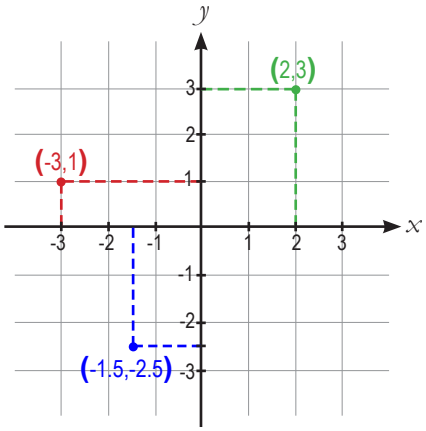
Subject: MATHEMATICS **Year: 7**

Strand: GEOMETRY

Sub-strand: 7.9 COORDINATE GRAPHS AND LOCATIONS (10 periods)

The French mathematician, Rene' Descartes devised the two – dimensional coordinate plane (Cartesian plane). It enables us to describe the positions of objects using the grid system. We can construct a coordinate plane and use the grid to plot, name, and locate points in the two – dimensional plane. The two – dimensions are named as; "axes" with horizontal line as the 'y – axis' and the vertical line as the 'x – axis.' The position of a point on a surface, relative to another point, can be described using angular measurement. Positions are expressed as bearings. There are two conventions: 'True bearings' – relative to NORTH only, and 'Compass bearings' – relative to two points, closest to any either North or South of the compass. The compass represent a 'Full Turn – 360^0 and the points on the compass represent parts of a turn. A scale is a ratio device for representing ground distances on the maps.

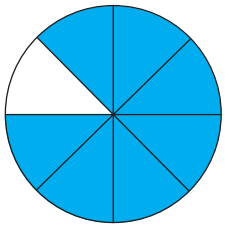
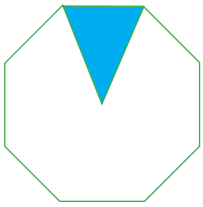
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
DIRECTIONS IN TWO DIMENSIONS **7.9.1** understand that there are two (2) dimensional (sides) to a grid which allow us to identify and describe locations of objects ***(u)***	**7.9.1.1** identify and label parts of the coordinate plane: *x and y axes, origin, across* and *up* **7.9.1.2** draw and construct the coordinate planes and axes	**1.** copy the set of axes shown onto grid paper. On your set of axes mark the point *A*(1, 2) as shown. Now mark the following points on the same set of axes: **(a)** *B* (4,2) **(b)** *C* (4,5) **(c)** *D* (2,3) **(d)** *E* (4,1) **(e)** *F* (5,3) **(f)** *G* (5,0) **(g)** *H* (0,4) 
7.9.2 use directions in the two dimension plane to locate the positions of the objects ***(u)***	**7.9.2.1** describe and identify the positions of objects using across and up	
THE COORDINATE NUMBER PLANE **7.9.3** understand that positions of objects can be identified and described by using lines from the two sides of the plane to find the point through ordered pairs ***(u)***	**7.9.3.1** name the positions of objects on the coordinate plane using 'across and up'	
7.9.4 understand that points on the number plane are described by coordinates from the *x* and the *y* axes ***(u)***	**7.9.4.1** locate the positions of points on the grid by giving the coordinates using *x* and *y* axes values **7.9.4.2** plot and name coordinate pairs on the coordinate plane, using the x and y axes values	
SCALE DIAGRAMS AND MAPS **7.9.5** understand that map is an useful way of recording and keeping information about things in real life such as area, places, buildings etc. ***(u)***	**7.9.5.1** identify some of the things in life that can be represented using maps: *Buildings, Land, area etc.*	
7.9.6 know that Direction North and Scales must always be included in maps ***(k)***	**7.9.6.1** identify the direction of the map: normally given in North and its Scales, which normally express as ratio	

Subject: MATHEMATICS	Year: 7	
Strand: GEOMETRY		
Sub-strand: 7.9 COORDINATE GRAPHS AND LOCATIONS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
7.9.7 know how to find the distances on the map and the ground given the scales ***(k)*** **MAPS AND BEARINGS** **7.9.8** understand the importance of bearings in navigation where directions, distances and positions of locations are determined at a given time ***(u)***	**7.9.7.1** calculate the distances on the map and the ground using given scales that are expressed as ratios **7.9.8.1** identify the purpose of bearings **7.9.8.2** identify areas where bearings are used widely by people **7.9.8.3** identify the two bearings (2) that are used to give Directions: - *True Bearings and* - *Compass Bearings* **7.9.8.4** define the two bearings: ***True bearings*** and ***Compass bearings*** *True bearings:-* angle of a turn, starting from North in clockwise direction. *Compass bearings*: - angle of turn, up to 90^0 and referring to East or West. Eg: $S40^0E$	**2.** name the coordinate points that are given in the plane.  **3.** Plot the following points on the coordinate plane A (2,4), B (4,8) C (7,2), C (-4,6) D (-3, -6)
7.9.9 know how to find bearings of given points and draw diagrams of given angles using protractor ***(k)*** **7.9.10** know how to calculate actual distances on the ground using directions and scale factor that are given on the map ***(k)***	**7.9.9.1** find bearings of given points using protractor, starting from North **7.9.9.2** draw diagrams of given angles using protractors **7.9.10.1** calculate the actual distance on the ground by using the given scales on the map	**4.** using only a compass, a ruler and a pencil: **(a)** bisect a line **(b)** bisect an angle. **5.** using only a compass, a ruler and a pencil: **(a)** construct an equilateral triangle **(b)** construct a square. **6.** using only a compass, a ruler and a pencil: **(a)** construct an angle equal to another angle **(b)** construct a pair of parallel lines **7.** using only a compass, a ruler and a pencil: **(a)** construct a 90° angle **(b)** bisect this angle to make a 45° angle.

Subject: MATHEMATICS **Year: 7**

Strand: NUMBER

Sub-strand: 7.10 FRACTIONS
This sub-strand covers the language and notation of fractions. It deals with simplifying fractions and finding equivalent fractions. It covers converting from improper to mix numbers and vice versa. Adding, subtracting, multiplying and dividing fractions with like and unlike denominators are dealt with. Finding fractions of quantities and finding squares and square roots of fractions are part of the sub-strand. Applying the 'order of operations rules to fraction calculation is covered.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
SHADED DIAGRAMS **7.10.1** understand fraction as a 'Part of a whole thing' that is equally divided, and be expressed in FRACTION ***(u)***	**7.10.1.1** define fraction: 'Part of a whole' expressed as fraction **7.10.1.2** name parts of a Fraction: Numerator (top number) and Denominator (bottom number)	**1.** what fraction of each diagram is shaded? **(a)** 
7.10.2 know that there are different types of fractions ***(k)***	**7.10.2.1** name and identify 3 different types of fractions: *Proper fraction, Improper fraction, and Mix Numbers*	
7.10.3 know how to express shaded diagrams in fraction ***(k)***	**7.10.3.1** find the fractions of shapes that have part/s of it shaded	**(b)** 
7.10.4 know how to simplify fractions ***(k)***	**7.10.4.1** simplify fractions to find their simplest form	
MIX NUMBERS AND IMPROPER FRACTIONS **7.10.5** know how to change mix numbers to Improper Fractions ***(k)***	**7.10.5.1** change mix numbers to improper fractions	
7.10.6 know how to convert improper fractions to mix numbers ***(k)***	**7.10.6.1** change improper fractions to mix numbers by dividing the numerator by the denominator	**2.** write pairs of equivalent fractions by copying and completing the following. **(a)** $\frac{3}{4}=\frac{\square}{20}$ **(b)** $\frac{1}{3}=\frac{7}{\square}$ **(c)** $\frac{1}{2}=\frac{\square}{52}$
7.10.7 know how to identify equivalent fractions ***(k)***	**7.10.7.1** find and calculate equivalent fractions	
ADD AND SUBTRACT FRACTIONS **7.10.8** know how to add and subtract fractions with the same denominators ***(k)***	**7.10.8.1** add and subtract fractions with the 'same' denominators **7.10.8.2** add and subtract Mix – Numbers with the same denominators	**3.** write the following fractions and mixed numbers in their simplest form. **(a)** $\frac{5}{10}$ **(b)** $1\frac{6}{20}$ **(c)** $2\frac{35}{42}$
7.10.9 know how to add and subtract fractions with different denominators ***(k)***	**7.10.9.1** add and subtract fractions with 'different' denominators **7.10.9.2** add and subtract Mix – Numbers with the different denominators	

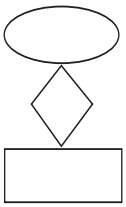
Subject: MATHEMATICS	Year: 7	
Strand: NUMBER		
Sub-strand: 7.10 FRACTIONS		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
MULTIPLY AND DIVIDE FRACTIONS **7.10.10** know how to multiply and divide fractions ***(k)***	**7.10.10.1** multiply fractions: *cancel common factors then evaluate top and bottom numbers* **7.10.10.2** divide fractions: *change ÷ sign to x sign then reciprocate next fraction then cancel and evaluate top and bottom numbers*	**4.** write these mixed numbers as improper fractions. **(a)** $1\frac{3}{4}$ **(b)** $3\frac{1}{5}$ **(c)** $6\frac{2}{3}$
7.10.11 apply multiplication of fractions to solve questions that deal with real life situations ***(s)***	**7.10.11.1** solve practical questions of fractions using division and multiplication	**5.** use the less than or greater than signs to show which of these fractions are bigger or smaller. **(a)** $\frac{2}{7}$ ___ $\frac{5}{7}$
FRACTION OF QUANTITIES **7.10.12** know that word 'of' can be replaced with multiplication 'x' sign to evaluate fractions ***(k)***	**7.10.12.1** evaluate fractions that have the word 'of' in it	**(b)** $\frac{4}{5}$ ___ $\frac{4}{7}$
7.10.13 know how to find quantities of given items using fractions ***(k)***	**7.10.13.1** evaluate practical questions by taking fraction of quantities	**(c)** $\frac{1}{2}$ ___ $\frac{5}{8}$
SQUARE AND SQUARE ROOTS OF FRACTIONS **7.10.14** know how to Square fractions ***(k)***	**7.10.14.1** square fractions: *Square numerator then Square denominator* **7.10.14.2** square Mix-Numbers by changing it to improper fraction	**6.** Ali gets 7 out of 8 shots at goal in the basket. Joseph gets 10 out of 12 shots in. Bycomparing fractions, determine who is the more accurate shooter. **7.** in a box containing 16 chocolates, 5 of them contain nuts. A larger box with 64 of the same brand of chocolates contains 23 nut chocolates. Which box contains the greater fraction of chocolates with nuts?
7.10.15 know how to take square roots of fractions ***(k)***	**7.10.15.1** take the square roots of fractions **7.10.15.2** take the square root of mix numbers by changing it to improper fraction	**8.** what fraction of a large pizza was eaten if Steven had of the pizza and Lara had of it? Write your answer in simplest form.
ORDER OF OPERATIONS **7.10.16** know how to apply BODMAS rule to evaluate fractions with mixture of operations ***(k)***	**7.10.16.1** evaluate and simplify fractions that involve mixture of operations using BODMAS Rule	

Subject: MATHEMATICS **Year: 7**

Strand: MEASUREMENT

Sub-strand: 7.11 TIME and MASS (10 periods)
Intervals of time are represented on analog or digital clocks, as segments of either 12 hours or 24 hours periods. Appropriate expressions of time and tools for representing time are dealt with. Clocks calendar, schedules, timetables and timelines are studied. The units of time and conversions between those are dealt with. The concept of mass as the amount of materials; the appropriate units for mass; and the use of instruments to measure mass are studied.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
TIME LINES **7.11.1** understand that Events that occur in life can be expressed using lines with scales marked on them, indicating sequences of events that occur in life ***(u)***	**7.11.1.1** define Timeline **7.11.1.2** identify different parts of a Time Line	**1.** draw a time table to show the programs that are aired by the Solomon Islands Broadcasting Corporations from 6 am to 6 pm. **2.** convert the followings:
7.11.2 know how to read scales and get extra information from a Time Line ***(k)***	**7.11.2.1** read and interpret information given on a time line **7.11.2.2** construct time lines and identify dates, time etc of events that occur in a given time-period **7.11.2.3** label and place dates and events on a time line	**(a)** 5 minutes = _____ seconds **(b)** 35 days = _____ weeks **(c)** 700 years = _____ centuries **(d)** 3 ½ decades = ___ years **3.** Mary is making calculations. She multiplies 24 by 7 on a calculator to get the answer 168. Add the two missing words to complete the sentence given below. 'There are 168 ____ in a _____. Choose from this list. Minutes, hours, day, days, week, month
TIME CONVERSIONS **7.11.3** know how to do conversion between units of time ***(k)***	**7.11.3.1** identify the common units of Time:*Second, Minute, Hour, Day, Week, Month and Year* **7.11.3.2** convert one unit of time from one to another	
TIME DIFFERENCE AND THE CALENDAR **7.11.4** understand that a 12 months calendar is the same everywhere but have different times and days due to locations and positions different countries ***(u)***	**7.11.4.1** define what BC and AD stand for **7.11.4.2** find number of years, months, days and time in a given period of time	**4.** the boat leaves Point Cruz, Honiara to travel to Auki. It leaves at 10:15 am. It takes 6 hours 50 minutes to reach Auki. Whne does it arrive? **5.** April, June, September, and November have 30 days, February have 28 days. All other months have 31 days.
TIME DIFFERENCE IN HOURS AND MINUTES **7.11.5** know how to read and express time in different format: 12 and 24 hrs clock, analogue and digital format ***(k)***	**7.11.5.1** define what AM and PM stands for **7.11.5.2** identify 2 Time Systems: 12 Hours and 24 Hours Time **7.11.5.3** find time using clock face and digital time **7.11.5.4** calculate time using 12 Hour and 24 Hour times	**(a)** suppose 18 June was a Monday, what is the day of the week is on 2 July" **(b)** suppose 20th October was a Friday, what is the date and day of the week is on 25 days later

Subject: MATHEMATICS	Year: 7	
Strand: MEASUREMENT		
Sub-strand: 7.11 TIME and MASS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
USING TIME TABLES **7.11.6** understand that the 'Table' an appropriate format to tabulate and put time schedules in it ***(u)***	**7.11.6.1** use and read time schedules given in tables which indicate when events and services are occurring	**6.** change these 24 hours clock times to am/pm clock **(a)** 0915 _____ **(b)** 1430 _____ **(c)** 2310 _____ **(d)** 1255 _____
TIME ZONES **7.11.7** understand that the rotation of the earth causes daylight and night time at different time in different zones on earth ***(u)***	**7.11.7.1** read times and their corresponding times in different parts of the world	**7.** write these times in 24 hours time. **(a)** 3:30 am **(b)** 4:20pm **(c)** Midday **(d)** Quarter to two in the afternoon
ODERING EVENTS AND FLOW CHART **7.11.8** understand that for tasks to successfully implemented, ORDER in which events are occurring need planning ***(u)***	**7.11.8.1** arrange given information in order of their occurrences	**8.** the school starts at 8:10 am the finishes at 2:20 pm. **(a)** how long is the school day in hours **(b)** how long in minutes
7.11.9 know how to arrange information in a logical order and present them in the flow chart ***(k)***	**7.11.9.1** use Flow Chart show the logical flow of information  - Start or stop - Use for decision Yes or No - Use for instruction	
MASS AND CONVERSION OF UNITS OF MASS **7.11.10** understand that mass is the measure of the amount of materials in an object is ***(u)***	**7.11.10.1** define mass **7.11.10.2** identify units of mass and calculate weights of various objects	
7.11.11 know how to change one metric unit from one to another ***(k)***	**7.11.11.1** change one unit of mass to another 1 tonne = 1 000 kg 1 g = 1 000 mg 1kg = 1 000 g	

Subject: MATHEMATICS **Year: 7**

Strand: PROBABILITY AND STATISTICS

Sub-strand: 7.12 PROBABILITY (15 periods)
The language of chance is used in everyday situations to make comparisons and estimations of the outcome of simple events. The theoretical probabilities are calculated by finding the number of favourable outcomes and divide it by the total number of outcomes. Practical games and activities can be used to test the chance of certain events occurring. Percentages, decimals and fractions can be used to represent probabilities.

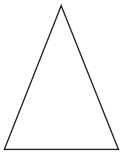
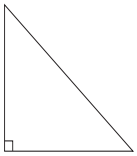
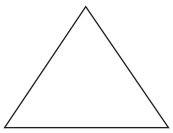
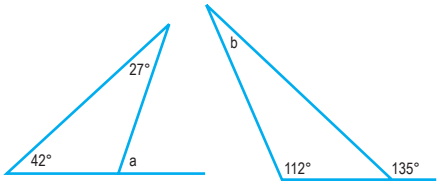
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
THE LANGUAGE OF CHANCE **7.12.1** understand the language of chance in everyday situations represents the likelihood of an event occurring ***(u)***	**7.12.1.1** identify and define the terms that are used to express probabilities used in everyday situations: *'Unlikely,' 'definitely,' 'even chance,' 'probably,' 'impossible,' 'certain.'*	1. in a class of 30 students there are 12 boys and 18 girls. **(a)** What is the probability that a girl is chosen at random to be the class representative on a committee? **(b)** What is the probability that a boy is chosen at random to be the class representative on a committee? **(c)** Is a girl or a boy more likely to be chosen at random? Why?
7.12.2 know how to use a 'probability scale' to indicate the positions of the likelihood that an event would occur ***(k)***	**7.12.2.1** use the 'probability scale' or number line to represent the occurrence of events 0 ½ 1 Impossible Certain	**2.** Find the probability of: **(a)** rolling an odd number with a normal die **(b)** selecting a vowel (a, e, i, o, u) from a bag containing 26 different letters of the alphabet.
7.12.3 understand that probability can be expressed in many different ways: words, percentages, fractions and decimals ***(u)***	**7.12.3.1** express the probability of events to occur, knowing the total possible outcome in words, percentages, fractions and decimals	**3.** decide whether you would describe the following events as 'impossible', 'not likely', 'likely' or 'certain'.
THEORETICAL PROBABILITY **7.12.4** understand that in 'theoretical probability' all possible outcomes are considered with equal chances, therefore outcome can be calculated ***(u)***	**7.12.4.1** find probability of events occurring, express as fractions in their lowest form	**(a)** Tomorrow will have a maximum temperature of -20°C. **(b)** Christmas Day will be on 25 December. **(c)** The Sun will set tonight. **(d)** You toss a coin and either a head or a tail turns up. (e) You roll a die and a 1 turns up.
7.12.5 know how to estimate the probability of an event in a range of possible outcomes ***(k)***	**7.12.5.1** calculate theoretical probabilities using the given formula: $PE = \frac{\text{no. of favourable outcome}}{\text{Total number of outcomes}}$ - For event is certain to occur = 1 - For event not certain to occur = 0	**4.** write out the sample space for each of the following games. **(a)** A ten-sided die, labelled 1 to 10, is rolled once. **(b)** A letter is drawn at random from the letters of the word probability. **(c)** A coin is tossed twice.

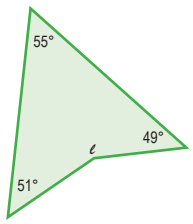
Subject: MATHEMATICS	Year: 7	
Strand: PROBABILITY AND STATISTICS		
Sub-strand: 7.12 PROBABILITY (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPLORING SIMPLE EXPERIMENTS **7.12.6** know how to explore more probabilities of events using (k) - simple experiments - spinners - games of chance - card games	**7.12.6.1** calculate probabilities of events: simple experiments, card games, spinners etc	**5.** a bag of jelly beans contains 4 blue, 5 red, 3 green, 2 purple and 1 black jelly beans. **(a)** Rachel puts her hand in the bag and selects one jelly bean without looking. What is the probability of the jelly bean being: (i) red (ii) green (iii) blue or purple?
USING STATISTICS TO FIND PROBABILITIES **7.12.7** understand that when attempting to estimate the chance of event to occur, we look to past experiences (u)	**7.12.7.1** predict the chance of event to occur using past occurring events	
7.12.8 know how to read and use existing data to predict the chance of an event to occur (k)	**7.12.8.1** calculating probabilities of an event that would occur using collected data	

Subject: MATHEMATICS **Year: 7**

Strand: GEOMETRY

Sub-strand: 7.13 POLYGONS (15 periods)
Polygons are plane and flat shapes enclosed by straight lines. Regular polygons such as triangles and quadrilaterals have special sides and angle properties. Triangles and quadrilaterals are named according to their side properties. There are relationships between the angles of a polygon and its sides. These relationships can be expressed algebraically. Such relationships can also be used to calculate angle sizes. Geometry tools can be used to construct polygon.

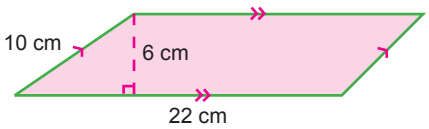
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
TRIANGLES: SIDE PROPERTIES **7.13.1** recognize the side properties of any given triangles and symbols used to identify some of their properties ***(s)***	**7.13.1.1** identify different properties of given triangles and the marks or symbols that identify some of their properties	**1.** find the sum of the angles in a dodecagon (12 sides) **2.** name the side properties of triangles
7.13.2 know how find the names of given triangles by using measuring instruments to measure the sides of given triangles ***(k)***	**7.13.2.1** measure the dimensions (sides) of different triangles and name them according to their side properties: *Scalene, Isosceles and Equilateral*	**3.** name the following triangles (a)  (b) 
TRIANGLES: ANGLE PROPERTIES **7.13.3** know that triangles are named according to their angle properties ***(k)***	**7.13.3.1** name triangles according to Angle Properties **7.13.3.2** measure the angles of given triangles and name them according to their angle properties: *Acute, Obtuse and Right-angled triangles*	(c) 
FINDING THE THIRD ANGLE IN A TRIANGLE **7.13.4** know that the total sum of the three interior angles in a triangle is 180^0 (degrees) ***(k)***	**7.13.4.1** identify the three interior angles of any given triangles	
7.13.5 know how to find the third missing angle in a triangle ***(k)***	**7.13.5.1** calculate the third missing interior angle, given the other two angles	
EXTERIOR ANGLE PROP ERTIES OF TRIANGLES **7.13.6** know that each of the three interior angles in a triangle has a supplementary exterior angle which add to 180^0 ***(k)***	**7.13.6.1** identify the supplementary exterior angles of the three interior angles of any given triangles	**4.** the value of the pronumeral is: 
7.13.7 know how to find the exterior angle of a triangle by using the Exterior angle properties ***(k)***	**7.13.7.1** use the given formula to find the 'Exterior angle. *Exterior angle = sum of the two interior opposite angles*	
QUADRILATERALS **7.13.8** know that a quadrilateral is a plane shape or figure with four (4) sides ***(k)***	**7.13.8.1** identify and name different types of quadrilaterals according to their properties	

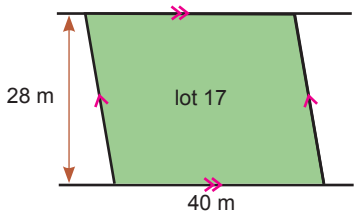
Subject: MATHEMATICS	Year: 7	
Strand: GEOMETRY		
Sub-strand: 7.13 POLYGONS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
ANGLE SUM OF QUADRILATERALS **7.13.9** understand that the angle-sum of any quadrilateral is 360^0 ***(u)***	**7.13.9.1** find the angles of quadrilateral by using the protractor to measure them **7.13.9.2** calculate the angle - sum of different quadrilaterals and missing angles	**5.** find the size of the angle labelled with a letter in each quadrilateral. 
POLYGONS **7.13.10** understand that a flat, plane figure enclosed by straight lines is a polygon ***(u)***	**7.13.10.1** define the term Polygon **7.13.10.2** identify and name different polygons from pictures and shapes *Triangle, quadrilaterals, pentagon, hexagon, heptagon, octagon, nonagon, decagon and dodecagon*	**6.** an angle in a parallelogram measures 40°. Draw a diagram and mark in the size of each of the other three angles.
ANGLE SUM OF POLYGONS **7.13.11** understand that any regular four (4) sided polygon shapes can be split into triangles to find the total sum of interior angles ***(u)***	**7.13.11.1** use total degrees in a *triangle* = 180^0 to calculate the total interior angles in any quadrilaterals **7.13.11.2** divide polygon shapes into triangles to find the total sum of interior angles	**7.** a quadrilateral has one 45° angle and three unknown angles that are equal to each other. What is the size of each of the three unknown angles?
7.13.12 know the relationships between the sides of the polygon and the sum of the interior angles ***(k)***	**7.13.12.1** calculate the angle-sum of any given polygons using the formula: *Angle sum* = $(n - 2) \times 180^0$ *Where n = number of sides of a polygon*	**8.** a quadrilateral has two angles of 70° and 34°. The other two angles are equal to each other. **(a)** What is the size of the two unknown angles? **(b)** What type of quadrilateral could this shape be?
EXPLORING POLYGON CONSTRUCTIONS **7.13.13** know how to construct triangles and quadrilaterals using protractors ***(k)***	**7.13.13.1** construct triangles and quadrilaterals using protractors	
7.13.14 know to how construct regular polygons in a circle using a ruler and a protractor ***(k)***	**7.13.14.1** construct regular polygons in a circle using a ruler and a protractor	
EXPLORING GEOMETRIC DESIGNS **7.13.15** understand that polygon shapes can be used to create very good and attractive patterns and designs ***(u)***	**7.13.15.1** use polygon shapes to create geometrical designs and patterns	

Subject: MATHEMATICS **Year: 7**

Strand: MEASUREMENT

Sub-strand: 7.14 AREA AND VOLUME (15 periods)
The sub-strand deals with the concept of area as an enclosed space; estimation and counting of unit square; the various units of area and conversions between them; the use of formula to calculate the area of polygon and shapes composed of regular polygons. It also deals with the concept of volume as a 3 – dimensional space; the idea of space filling with cubes of unit volume; The derivation of formula for prism for volume, form the idea of space filling; the application of formula for calculating volume of shapes consisting of cubes and cuboids.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
FINDING AND COMPARING AREAS **7.14.1** understand that area is a two – dimensional space enclosed inside a shape ***(u)***	**7.14.1.1** define area **7.14.1.2** find areas of various shapes	**1.** calculate the area of the following shapes.
7.14.2 understand that the GRID can be used to estimate and determine the area of a any given shapes by placing the grid on to the shapes ***(u)***	**7.14.2.1** determine areas of shapes by using squared grid **7.14.2.2** compare areas of different shapes using squared – dotted grids **7.14.2.3** use square grid to estimate the area of various regular shapes	**2.** state which of the units of area—mm2, cm2, m2 or km2—would be most suitable for measuring the area of: (a) a sheet of writing paper (b) your little toe-nail (c) a pizza (d) a house block
USING GRID TO FIND AREAS **7.14.3** know how to use a unit square grid to estimate and determine the areas of regular and irregular shapes ***(k)***	**7.14.3.1** estimate and determine the area of regular and irregular shapes using grid	**3.** a builder wishes to estimate the number of bricks required to build a wall 4.2 m wide and 2.6 m high. If 1 square metre of brick wall contains 48 bricks, how many bricks are needed?
AREAS OF POLYGON SHAPES **7.14.4** know how to calculate the area of various polygons ***(k)***	**7.14.4.1** use the correct formulas and rules to calculate the area of polygon shapes: - *Rectangle : Area = length x width* - *Parallelogram: Area = base x height* - *Triangle: Area = ½ base x height* - *Rhombus:* *i. Area = Base x Height* *ii. Product of the two diagonals ÷ 2* *OR* $Area = \frac{D1 \times D2}{2}$	**4.** a rectangle has a perimeter of 26 cmand an area of 30 cm2. What are its dimensions (length and width)? **5.** a netball court is 30.5 m long and 15.25 m wide. **(a)** At training, players complete five laps around the boundary of the court. How many metres is this? **(b)** Calculate the area of the court **6.** find the area of each of the following parallelograms 

Subject: MATHEMATICS	Year: 7	
Strand: MEASUREMENT		
Sub-strand: 7.14 AREA AND VOLUME (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
VOLUME AS A MEASURE OF SPACE **7.14.5** understand that volume is the amount of spaces contain in a 3 – dimensional shape ***(u)***	**7.14.5.1** define volume	**7.** a parallelogram with a base length of 12 cm has an area of 90 cm2. What is the height of the parallelogram?
7.14.6 know that volume of 3 – Dimensional shapes is determined by cutting up the shape into equal cubes ***(k)***	**7.14.6.1** determine the volume of solid by counting number of cubic units that fit inside the shape **7.14.6.2** count the number cubes to determine the volume of each shape if each cube is a cubic centimetre	**8.** a block of land appears on a council map as shown. Calculate its area in square metres. 
EXPLORING VOLUMES **7.14.7** know how to derive a Rule or Formula to calculate volume of rectangular prisms using cubic blocks ***(k)***	**7.14.7.1** derive a Rule or Formula using blocks or tables that can be used to calculate volume of shapes and objects	
VOLUME OF RECTANGULAR PRISMS **7.14.8** know how to calculate the volume of various prisms and composite shapes using formulae ***(u)***	**7.14.8.1** calculate the volume of shapes and prisms using formula: *Volume = length x width x height*	
VOLUME OF PRISMS **7.14.9** know how to find the volumes of various shapes and prisms ***(k)***	**7.14.9.1** calculate volume of prisms and objects by determining the area of the Base first. *Volume = Area of base x height*	

12.2 Secondary Mathematics Year 8 Syllabus

Subject: MATHEMATICS **Year: 8**

Strand: MEASUREMENT

Sub-strand: 8.1 PERCENTAGES (15 periods)
Percentages is a special fraction where the denominator MUST always be 100, with a given term as, 'Per cent, which means out of 100' – with the symbol " % ". Learners will do conversions between percentages, decimals and fractions. Percentages can be used to make comparisons between the prices of goods and items and could be used as guidelines in getting the best buys especially to calculating discounts, increases and decreases and interests.

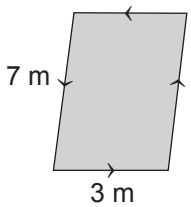
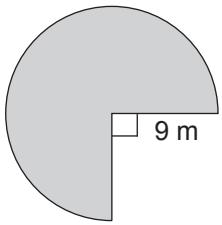
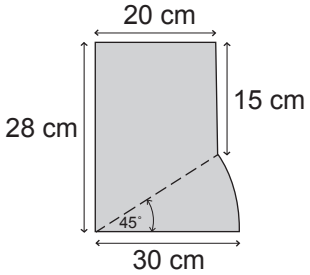
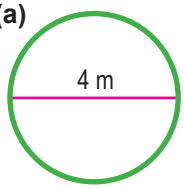
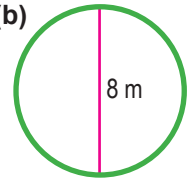
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
INTRODUCING PERCENTAGES **8.1.1** understand Percentage as fraction with a special denominator of 100.Per Cent means "Out of 100" ***(u)***	**8.1.1.1** define percentage and identify its symbol - %	**1.** approximately what percentage of the shapes are shaded? **(a)** **(b)**
8.1.2 know how to express percentages by shadingboxes and other quantities ***(k)***	**8.1.2.1** expressing quantities as Percentages by shading parts of the shapes and against other quantities **8.1.2.2** arrange percentages in ascending and descending order	**2.** Rebecca needs to score at least 80% on the theory test To pass her exam. She knows that the test contains 40 questions. What is the minimum number of questions Rebecca must get correct in order to pass?
PERCENTAGES TO FRACTIONS **8.1.3** know how to express percentages as fractions in their simplest form ***(k)***	**8.1.3.1** change Percentages into Fractions in their lowest form	
FRACTION TO PERCENTAGES **8.1.4** know how to change fractions to percentages ***(k)***	**8.1.4.1** change or convert fractions to Percentages (*multiplying it by 100*) **8.1.4.2** change mix – numbers to Percentages. *(change mix -numbersto improper fractions then multiply by 100)*	**3.** write the following percentages as fractions in simplest form. **(a)** 17% **(b)** 48% **(c)** 9% **(d)** 65% **(e)** 58% **(f)** 76% **(g)** 117% **(h)** 129%
PERCENTAGES TO DECIMALS **8.1.5** know how to convert Percentages to Decimal ***(k)***	**8.1.5.1** change or convert Percentages to Decimal. *(Divide the numerator by 100. Move the decimal point to the left Twice)*	**4.** write the following percentages as fractions in simplest form. **(a)** 8.3% **(b)** 12.29% **(c)** 50.5% **(d)** 62.5%
DECIMALS TO PERCENTAGES **8.1.6** know how to convert Decimals to Percentages ***(k)***	**8.1.6.1** change decimals to percentages. *(Multiply the decimal number by 100. Move decimal point twice to the right)*	**5.** Monica travelled 45% of the journey across Viru to Seghe by canoe What is the decimal equivalent of the percentage travelled by Monica?
FINDING PERCENTAGES OF QUANTITIES **8.1.7** know how to use percentages to find unknown quantities ***(k)***	**8.1.7.1** calculate percentage of quantities by multiplying quantities by the percentage given as fractions. Change the " ***of*** " sign to " ***x*** " then evaluate	**6.** Jacob received 92.5% on his History test. What is the decimal equivalent of Jacob's result?
EXPRESSING A QUATITY AS A PERCENTAGE **8.1.8** understand that a quantity can be expressed as percentage of another quantity ***(u)***	**8.1.8.1** express one quantity as percentage of another quantity by writing it as fraction then multiply it by100	

Subject: MATHEMATICS	Year: 8	
Strand: MEASUREMENT		
Sub-strand: 8.1 PERCENTAGES (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
PERCENTAGE INCREASE AND DECREASE **8.1.9** know how to apply formula to calculate percentage increase and decrease ***(k)***	**8.1.9.1** calculate the percentage increase and decrease, using the formula: *Percentage change* = *increase/decrease in quantity* / *Original quantity* x 100	**7.** express the first amount as a percentage of the second. Give your answers in (i) fractional and (ii) exact decimal form. **(a)** 23, 40 **(b)** 35, 30
EXPLORING PERCENTAGES **8.1.10** understand how percentages are used to compare quantities and express changes in numbers ***(u)***	**8.1.10.1** calculate percentages of various practical applications of percentages then compare the changes in percentages and numbers.	**8.** calculate the sale price of the following items, rounding your answers to the nearest cent. **(a)** A $520 surfboard discounted by 20%. **(b)** A DVD originally priced at $18 discounted by 10%. **(c)** A $34.50 book discounted by 12.5%. **(d)** A digital camera with a marked price of $399.95 discounted by 35%.
DISCOUNTS **8.1.11** understand that discounts occur when prices on items are reduced by a certain percentages ***(u)***	**8.1.11.1** define discounts	
8.1.12 know how to calculate discounts by subtracting the discounted amount from the original price ***(k)***	**8.1.12.1** calculate the discounted price on various items	
EXPLORING SHOPPING **8.1.13** understand how percentages is used in the selling and buying of merchandise goods ***(u)***	**8.1.13.1 c**alculate various costs, selling prices, discounts, increase and decrease using percentages **8.1.13.2** compare discounts offered in shops using percentages	

Subject: MATHEMATICS **Year: 8**

Strand: NUMBERS

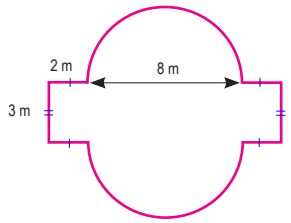
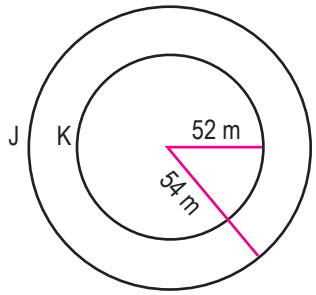
Sub-strand: 8.2 LENGTH AND PERIMETER (15 periods)
Perimeter is a path or distance that surrounds an area. The distance around 2 – dimensional objects can be determined by actually measuring or estimating their lengths with the units used, must be converted so that they are express as one unit. Calculating the perimeter has considerable practical applications where errors are inevitable in the process. The perimeter of a wheel (circle - its circumference) describes how far it will roll in one revolution. Humans do commit errors in the process of measuring but can be calculated and determined.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
ESTIMATE LENGTHS **8.2.1** know how to estimate lengths using known values ***(k)***	**8.2.1.1** estimate the lengths of different objects by comparing them to known lengths	**1.** find the perimeter of the following. **(a)** 
MEASURING LENGTHS **8.2.2** appreciate how measuring instruments such as ruler, tape measure can be used to give accurate measurements ***(a)***	**8.2.2.1** use rulers and tapes to accurately measure the lengths of various objects and shapes	
CONVERTING UNITS OF LENGTHS **8.2.3** know how to convert one metric unit of length from one to another ***(k)***	**8.2.3.1** change metric units of lengths from one to another using the given conversion factors below. - 1 Kilometre (km) = 1000 metres (m) - 1 Metre (m) = 100 centimetre (cm), - 1 Centimetre = 10 millimetres (mm)	**(b)** 
WORKING WITH LENGTHS **8.2.4** understand that lengths and distances can be measured using different units ***(u)***	**8.2.4.1** identify different units that are used to measure objects	**(c)** 
8.2.5 know how to add and subtract lengths of given shapes and objects with the 'same' and 'different' units ***(k)***	**8.2.5.1** add and subtract lengths with same and or different units.	
PERIMETER OF POLYGONS **8.2.6** understand perimeters of polygon is the distance around the shape and is found by adding all the sides together ***(u)***	**8.2.6.1** define the terms Perimeter and Polygon **8.2.6.2** find the perimeter of various polygon shapes by adding all the sides together	**2.** calculate the circumference of the following circles correct to two decimal places. **(a)**  **(b)** 

Subject: MATHEMATICS **Year: 8**

Strand: NUMBERS

Sub-strand: 8.2 LENGTH AND PERIMETER (15 periods)

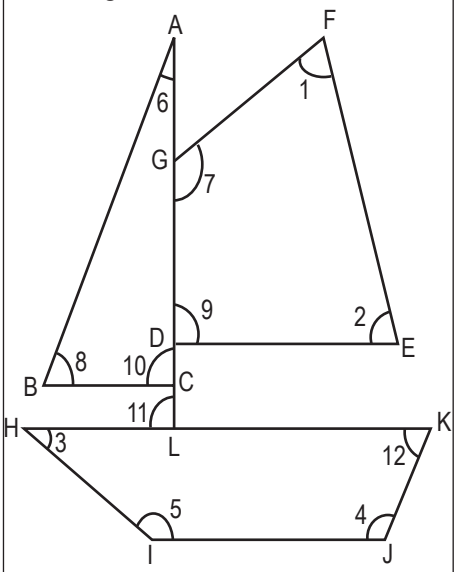
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
PERIMETERS OF SPECIAL QUADRILATERAL **8.2.7** know how to calculate the perimeter of quadrilateral shapes with the 'same or different units or both ***(k)***	**8.2.7.1** calculate the perimeter of quadrilateral shapes with the same, different or both units	**3.** find the perimeter of each of the following shapes correct to two decimal places. 
EXPLORING THE CIRCUMFERENCE OF A CIRCLE **8.2.8** understand that the distance around the circle is referred to as perimeter or circumference ***(u)***	**8.2.8.1** define Circumference or perimeter of a circle **8.2.8.2** calculate the perimeter or circumference of given circles	
8.2.9 know how circumference is determined and calculated ***(k)***	**8.2.9.1** write a General Statement in words connecting the diameter to the circumference	**4.** Jane and Kate run once around the circular track shown. Jane runs along path J, while Kate takes path K. How much further than Kate does Jane run? Give your answer correct to two decimal places.
8.2.10 understand what is diameter and how it is determined ***(u)***	**8.2.10.1** define diameter **8.2.10.2** divide the circumference by the diameter of regular objects to identify the relationship between them	
PERIMETER OF CIRCLES **8.2.11** know how to find the perimeter or circumference of a circle using the formula that uses diameter, radius and Pi (π) ***(k)***	**8.2.11.1** define radius and Arc Length **8.2.11.2** calculate the perimeter of any circles using; $C = \pi D$ or $C = 2\pi r$ **8.2.11.3** find the Arc Length of circles	
PERIMETER OF COMPOSITE SHAPES **8.2.12** know how to calculate the perimeter of composite shapes ***(k)***	**8.2.12.1** define the term composite **8.2.12.2** calculate the perimeter of composite shapes	**5.** a basketball has a diameter of 23 cm. To the nearest whole number, how many times would it roll if it rolled from one end of the court to the other end 28 metres away?
ERRORS IN MEASUREMENTS **8.2.13** understand that errors occur during the process of measurement can be determined and calculated ***(u)***	**8.2.13.1** calculate the error committed during the process of measurement and which are given in percentages and other units	

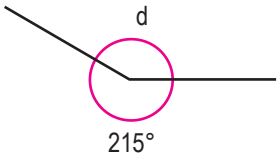
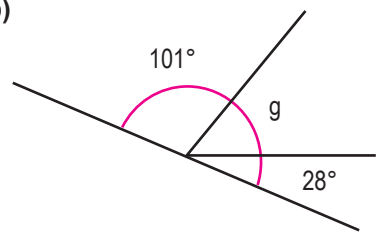
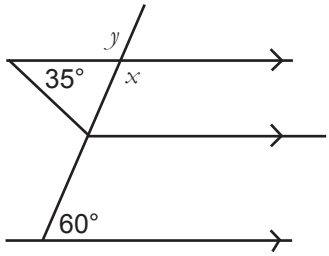
Subject: MATHEMATICS **Year: 8**

Strand: GEOMETRY

Sub-strand: 8.3 POLYGONS AND PARALLEL LINES

Polygons are closed, flat geometric shapes with finite sequence of straight lines which can refer to as edges or sides where, two or more edges meet we refer to it as corners or vertices. Triangles and polygons have been used extensively in constructions to provide strengths and through also been used in tessellation to create a lot of patterns and designs.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
ANGLE: REVISION **8.3.1** understand how alphabetical letters are used to give names to angles produced with straight lines ***(u)***	**8.3.1.1** name angles using letters that are put against the end of the lines and vertices **8.3.1.2** draw angles and name them	**1.** several angles are numbered in this diagram.  write down the names of the angles numbered 1 – 8 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____
8.3.2 know that angles are named and classified according to their sizes ***(u)***	**8.3.2.1** name and classify angles according to their sizes	
8.3.3 know how to calculate missing angles ***(k)***	**8.3.3.1** calculate missing angles using the properties of complementary, supplementary etc..	
ANGLES AND PARALLEL LINES **8.3.4** understand that angles are formed by parallel and Transversal lines when they cross each other ***(u)***	**8.3.4.1** define and identify Transversal and parallel lines	
8.3.5 know how to name different angle types and identify their properties ***(k)***	**8.3.5.1** name different 'Types of Angles' *Vertically Opposite; Corresponding; Alternate and Co-interior or allied angles*	
8.3.6 know how to find missing angles formed by parallel and transversal lines ***(k)***	**8.3.6.1** find the size of missing angles using the relationship between the angles and parallel lines	
PROPERTIES OF TRIANGLES **8.3.7** understand that there are different triangles with different names determine by their side and angle properties ***(u)***	**8.3.7.1** identify the 'side' and 'angle' properties of different triangles **8.3.7.2** name different triangles according to their *'side'* and *'angle'* properties. **8.3.7.3** measure angles using protractors	**2.** write down the complement of the following angles **(a)** 400 **(b)** 780 **(c)** 890 **(d)** 900 **(e)** 340 **(f)** 710
8.3.8 understand that there are *Exterior Angles* that are attached to the sides of any triangles ***(u)***	**8.3.8.1** identify the *Exterior Angle Properties* of any triangle **8.3.8.2** find the sizes of exterior angles using the *Exterior Angle Properties*	

Subject: MATHEMATICS	Year: 8	
Strand: GEOMETRY		
Sub-strand: 8.3 POLYGONS AND PARALLEL LINES		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
PROPERTIES OF QUADRILATERALS **8.3.9** understand quadrilaterals are polygons with four corners and four sides ***(u)***	**8.3.9.1** define quadrilaterals	**3.** find the value of the pronumerals in each diagram. Give reasons for your answer. **(a)** 
8.3.10 Know how to identify and distinguished between the six (6) main quadrilaterals ***(k)***	**8.3.10.1** name the six (6) main quadrilaterals and identify their properties.: *Rectangle; Square; Kite; Parallelogram; Rhombus; Trapezium*	
8.3.11 know that the sum of interior angles of a quadrilateral is equal to 360 ^{0} ***(k)***	**8.3.11.1** find the size of the missing angles in a quadrilateral using the angle sum of a quadrilateral which equals to 360 ^{0}	**(b)** 
PROPERTIES OF POLYGONS **8.3.12** understand polygon shapes and their properties ***(u)***	**8.3.12.1** define the term Polygon **8.3.12.2** name polygon shapes according to their side properties	
8.3.13 know that quadrilateral shapes can be divided or slit into triangles where properties for triangle can be used to find total interior angles in any polygons ***(k)***	**8.3.13.1** calculate the total angles in a quadrilateral using the angle-sum of a triangle which equals to 180^0	**4.** find the value of the pronumerals in each diagram. Give reasons for your answer. 
8.3.14 know how to use the formula to find the interior angle- sum of quadrilateral ***(k)***	**8.3.14.1** calculate the total angles in any polygon shapes using the formula: *Total angle-sum = (n – 2) x 180 ^{0}*	
EXPLORING GEOMETRIC BISECTIONS **8.3.15** know how to use a compass to construct lines, bisect lines, angles, etc. ***(k)***	**8.3.15.1** use a compass to; - bisect angles with straight edge - bisect line segment - identify the centre of any circle - find the circumference of any circle	

Subject: MATHEMATICS **Year: 8**

Strand: ALGEBRA

Sub-strand: 8.4 ALGEBRA SYMBOLS (10 periods)
Expression is a mathematic statement written using symbols, letters and other signs to represent numbers and values. It can be made up of term/s, coefficient and like terms. Operations have also been used to manipulate terms and expressions. Brackets can be used to group terms and symbols which can be evaluated as well. Expressions can be evaluated by following certain rules when values are equated to given pronumerals.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
ALGEBRAIC EXPRESSIONS **8.4.1** know what an expression is and how it is formed ***(k)***	**8.4.1.1** define the following terms: *Algebraic Expression, Terms; Pronumerals; coefficient; Like term; Unlike terms and Constants*	**1.** my bank account is currently overdrawn by $150. The balance is –$150. **(a)** If I withdraw another $25, what would the balance be then? **(b)** Write an expression for the balance if I withdraw a further $*d* from the balance in part a. **(c)** How much do I need to deposit on pay day so that my balance is brought back to $2*d*? Why?
8.4.2 know how to identify pronumerals, terms, coefficients and constant in an expression ***(k)***	**8.4.2.1** evaluate pronumerals that are given in statements **8.4.2.2** identify terms, coefficients and constants in expressions **8.4.2.3** write algebraic expressions for given statements that represent quantities.	
8.4.5 know how to group terms in a given expressions ***(k)*** **ADDING & SUBTRACTING LIKE TERMS** **8.4.6** know how to simplify expressions by adding and subtracting like terms ***(k)*** **MULTIPLY AND DIVIDE TERMS** **8.4.7** understand that terms in an expression can be multiplied and divided with other terms ***(u)***	**8.4.5.1** group like terms (same letters) together from an expression with many different terms **8.4.6.1** simplify expressions by adding and subtracting like terms. ***Like terms****: Same Bases & Same Powers* **8.4.7.1** simplify terms and expressions by dividing and multiplying with other terms using the following rules: **Same Sign = Positive:** *p x t = pt,* *- p x - t = pt* **Different Signs = Negative** *- a x b = - ab,* *a x – b = - ab*	**2.** list the groups of like terms from each of the following: **(a)** 7x, –5y, 9x, 3y, –x **(b)** 4a, –5ab, 4b, 9ba, –2a, 2ab, –b **(c)** $3p^2q$, –pq, $4pq^2$, 2pq, –4qp **(d)** $2x^2$, 5x, $-2x^2$, 6xy, $-8x^2$, $-x^2y$, 3yx, $-12yx^2$ **3.** simplify the following expressions by combining like terms: **(a)** 3a + 2b + c − 6a + 4b − 3c − 6a − 8b − 2c **(b)** 13ab + 4bc − 2ca − ab − 9bc − 5ab + 8ca **(c)** –3xy + 2yz − 7zy + 9zx + 2xy − 5yz − 8zx **4.** simplify the following products as far as possible: **(a)** –7 × 3x **(b)** 9 × –3y **(c)** –2a × –6 **(d)** 3y × –4x **(e)** –m2 × 7n **(f)** –2c × –5b **(g)** 3y × –5y × 4 **(h)** –7a × 2b × –9 **(i)**–6m × –5n × –9p

Subject: MATHEMATICS	Year: 8	
Strand: ALGEBRA		
Sub-strand: 8.4 ALGEBRA SYMBOLS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPANDING BRACKETS **8.4.8** understand that brackets in an expression can be expanded using 'Distributive Law' ***(u)***	**8.4.8.1** expand brackets by multiplying those terms outside to those terms inside the brackets - 'Distributive Law,' **8.4.8.2** write algebraic expressions using brackets for given mathematics statements	
EVALUATING ALGEBRAIC EXPRESSIONS **8.4.9** understand that expressions can be evaluated by substituting values to replace pronumerals in an expression ***(u)***	**8.4.9.1** define the term Evaluate **8.4.9.2** evaluate expressions by Substituting values into expression to replace pronumerals	
FORMULAS IN MATHEMATICS **8.4.10** understand that a formula is a rule that allow us to make calculations to find values for variables in an equation ***(u)***	**8.4.10.1** define the term Formula	
8.4.11 know how to use various formulae appropriately to evaluate and solve maths problems ***(k)***	**8.4.11.1** use various formulae appropriately to solve and evaluate practical problems	

Subject: MATHEMATICS **Year: 8**

Strand: NUMBERS

Sub-strand: 8.5 RATES AND RATIO (15 periods)
This sub-strand deals with recognizing and writing ratios in their simplest form, using ratios to determine the quantities or amount required, sharing quantities according to ratios, identifying graphs, leading to rates of exchange, interpreting everyday rates of exchange, reading information from rates of change graphs, calculating costs , and working with speed, distance and time using the formulae; speed = distance / time, D = S x T and T = D / S.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
RATIO AND PROPORTION **8.5.1** understand what ratio is how it how it is used to compare quantities and look at the relationships between quantities ***(u)***	**8.5.1.1** define ratio and proportion. **8.5.1.2** identify the symbol that is used to represent ratio: " **:**" it is called "IS TO" **8.5.1.3** write or express quantities as ratios	**1.** write each of the following ratios in simplest form. **(a)** 2 : 8 **(b)** 3 : 15 **(c)** 4 : 16 **(d)** 4 : 10 **(e)** 12 : 34 **(f)** 500 : 4000 **(g)** 225 : 325
SIMPLIFYING RATIOS **8.5.2** know that ratios can be simplified to its simplest form just like fractions ***(k)***	**8.5.2.1** expressing ratio of quantities as fractions then simplify them	**2.** There are 26 students in a Year 8 maths class. 15 of them are boys. **(a)** The ratio of girls to boys is: A 15 : 26 B 26 : 15 C 15 : 11 D 11 : 15
8.5.3 know how to simplify ratios of quantities that have different units ***(k)***	**8.5.3.1** simplify ratios of quantities that are given in different units	(b) The percentage of the class that are girls (to one decimal place) is: A 42.3% B 57.7% C 73.3% D 136.4%
8.5.4 know how to simplify fractional ratios ***(k)***	**8.5.4.1** simplify fractional ratios by using a common number to remove all the denominators	
FINDING QUANTITIES USING RATIOS **8.5.5** know how to use ratios to find unknown quantities ***(k)***	**8.5.5.1** find missing numbers and unknown quantities using given ratios	**3.** Write each of the following ratios in simplest form. **(a)** 5 cm : 3 mm **(b)** 75 cm : 1.5 m **(c)** 5 km : 600 m : 300 m **(d)** 8000 m : 5 km : 4.5 km
EXPLORING RATIOS IN TRIANGLES **8.5.6** know how to use ratios to divide lines into different parts or segments using ratios ***(k)***	**8.5.6.1** divide lines into different parts using given ratios **8.5.6.2** construct triangles using ratios	
SHARING USING RATIOS **8.5.7** understand that ratio can be used to share quantities, not necessary equal ***(u)***	**8.5.7.1** share quantities according to the parts that are indicated by the given ratios **8.5.7.2** share quantities using given ratios	**4.** write each of the following ratios in simplest form. **(a)** $3\frac{1}{2} : 1$ **(b)** $4 : 3\frac{2}{3}$
RATES **8.5.8** understand rate and its application ***(u)***	**8.5.8.1** define Rates ***Rates*** – *measure of how one quantity changes with respect to another*	**5.** write each of the following ratios in simplest form. **(a)** 4.7 : 3.1 **(b)** 1.7 : 5.2 **(c)** 2.9 : 3.4 **(d)** 4.5 : 7.2
8.5.9 know how to calculate the rates of different quantities and use them to find other quantities ***(u)***	**8.5.9.1** calculate different rate of given quantities **8.5.9.2** use given rates to find other quantities	

Subject: MATHEMATICS	Year: 8	
Strand: NUMBERS		
Sub-strand: 8.5 RATES AND RATIO (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
USING RATES: SPEED, DISTANCE AND TIME **8.5.10** understand how to use rates with regards to Speed, Distance and Time ***(u)***	**8.5.10.1** define Speed ***Speed*** *– the rate at which the distance changes with respect to time. It is measured in units of distance divide by time*	**6.** Linda and Jean own 35% and 65% of a company, respectively. When yearly profits are divided in proportion to each owner's investment in the company, Linda receives $450000.
8.5.11 know how to calculate speed, time and distances ***(k)***	**8.5.11.1** use the given diagram to calculate the rates of speed, distances and time $s = \frac{d}{t}$ $d = s \times t$ $t = \frac{d}{s}$ 	
GRAPHS AND TIME **8.5.12** understand that graph can be used to draw or get information from ***(u)***	**8.5.12.1** read Time Graphs to get extra information from	
SCALE DIAGRAMS **8.5.13** know that sizes of maps can be increased or decreased using scale factors that are expressed as ratio ***(k)***	**8.5.13.1** use ratio of the scale to find the map measurements and actual (real) measurements	
EXPLORING MAPS **8.5.14** know how to identify the contours of a map use it to draw cross – section of a map ***(k)***	**8.5.14.1** define contour line **8.5.14.2** calculate distances on the map using contour line **8.5.14.3** indicate the cross diagrams to given maps to help to find various distances between given points	

Subject: MATHEMATICS **Year: 8**

Strand: PROBABILITY AND STATISTICS

Sub-strand: 8.6 STATISTICS (15 periods)

Statistics in mathematics refers to the collection, analysis, interpretation, and presentation of data. Data that are numerical are grouped into two groups: Discrete numerical data and Continuous numerical data. The use of graphs like; histograms, column, stem – leaf plots have assisted in how we visualize the nature of the collected data. Mean, median, mode and range are some of the areas that are looked at when analysing the data collected.

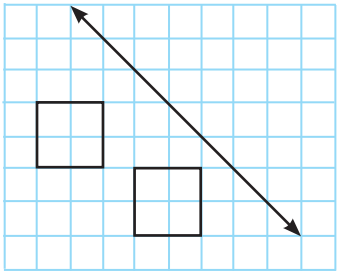
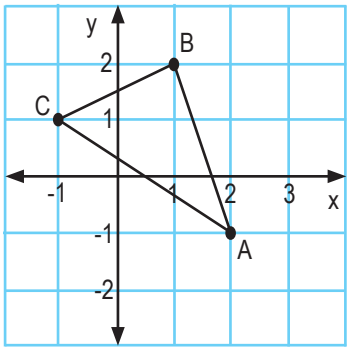
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
COLLECTING NUMERICAL DATA **8.6.1** understand that Numerical Data are normally collected are in two types: *Discrete* and *Continuous* numerical data ***(u)***	**8.6.1.1** define and identify *Discrete* and *Continuous* numerical data	**1.** a sample of 300 fish is taken from a lake, tagged andreleased. Sometime later, a second sample of 150 fishis taken and it is found that 20 of these are tagged. What is the estimated fish population for the lake?
8.6.2 know how to tabulate collected data into Frequency Tables ***(k)***	**8.6.2.1** display collected data (information) into Frequency Tables	**2.** Marist basketball team recorded the points they won in a 2013 Honiara basketball competitions. The points he earned in the last 15 games are listed below. 23, 37, 42, 36, 45, 52, 25, 65, 47, 37, 54, 36, 50, 48, 33 Find the **(i)** mean, **(ii)** median and **(iii)** mode of this data set.
COLUMN GRAPHS AND HISTOGRAM **8.6.3** understand that Column and Histogram Graphs can be used to represent and display collected numerical data ***(u)***	**8.6.3.1** identify and distinguished between the properties and features of a Column and Histogram graphs	
8.6.4 know how to construct Column and Histogram graphs ***(k)***	**8.6.4.1** display collected data (information) using Column and Histogram graphs **8.6.4.2** define and identify the modal score in a set of scores or data	**3.** Mary recorded the number of points her netball team scored this season. The points her team earned in 18 games are listed below. 43, 45, 56, 26, 36, 44, 64, 54, 67, 34, 42, 63, 51, 29, 41, 30, 55, 39 Find the **(i)** mean, **(ii)** median and **(iii)** mode of this data set.
THE MEDIAN, RANGE AND INTER – QUARTILE RANGE (IQR) **8.6.5** understand that data collected can be analysed by looking at the Median, Range and Inter-Quartile Range (IQR) ***(u)***	**8.6.5.1** define terms: Median, Range and Inter-Quartile Range – IQR **8.6.5.2** calculate the Median, Range and IQR of a set of scores	
STEM – AND – LEAF PLOTS **8.6.6** know how to display data using Stem – and – Leaf plots ***(k)***	**8.6.6.1** define and identify the properties and features of Stem – Leaf Plots **8.6.6.2** display information using Stemplot in an *order* of Stem and leaf	**4.** **(a)** for the data set: 1, 2, 2, 2, 3, 4, 5, 5, 6, 6, 6, 8, 8, 8, 8, 9 the median is.
THE MEAN **8.6.7** understand how average can be determined in a given set of scores ***(u)***	**8.6.7.1** define Mean **8.6.7.2** identify the formula to calculate the mean of a set of scores	**(b)** for the data set: 2, 3, 3, 4, 5, 6, 6, 6, 7, 7, 7, 9, 9, 9, 9 the mode is.
8.6.8 know how to find the mean of a set of Scores ***(k)***	**8.6.8.1** calculate the Mean or Average of a set of scores	**(c)** for the data set: 1, 1, 1, 2, 2, 3, 3, 3,3, 3, 5, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 8, 8, 9, 9 the mean is.

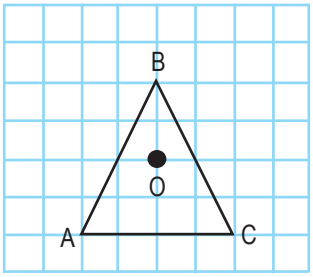
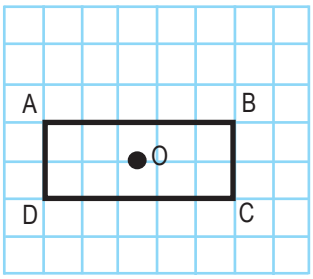
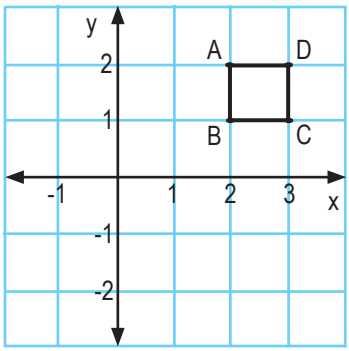
Subject: MATHEMATICS	Year: 8	
Strand: PROBABILITY AND STATISTICS		
Sub-strand: 8.6 STATISTICS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
MEAN ABSOLUTE DIFFERENCE **8.6.9** know how to find the scores around the mean with negative or positive set of scores ***(k)***	**8.6.9.1** define Mean Absolute Difference **8.6.9.2** identify the symbol that is use for absolute values: **l – a l = a**	**5.** for each of the following data sets, calculate the: (i) mean (correct to 2dp) (ii) median (iii) range **(a)** 12, 23, 23, 25, 26, 27, 28, 29, 29, 31, 32, 33, 35, 35, 36, 38 **(b)** 1, 23, 23, 25, 26, 27, 28, 29, 29, 31, 32, 33, 35, 35, 36, 38
8.6.10 know how to calculate the Mean Absolute values of set of scores ***(k)***	**8.6.10.1** calculate the Mean and the Mean Absolute Difference for given set of scores or results	
COMPARING THE MEAN AND THE MEDIAN **8.6.11** understand the difference between the Mean and Median as both are appropriate measure of the centre of a set of scores ***(u)***	**8.6.11.1** define absolute value **8.6.11.2** identify which of these two: Mean and Median can be best fit to measure the centre of scores **8.6.11.3** find mean and median of given scores	

Subject: MATHEMATICS **Year: 8**

Strand: GEOMETRY

Sub-strand: 8.7 TRANSFORMATIONS (15 periods)
Transformations occur every day around us. People paddle around in their canoes or see their images in the mirror. Transformation gives an object a new shape, position or size. **Translation, Reflection, Rotation** and **Enlargement** are the means that objects can be transformed. With translation a shift can be done to change the position of an object, mirror can produce mirror images, rotation turns the shape about a fixed point and enlargement can be done with scale factor and line.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
TRANSFORMATION **8.7.1** understand that Transformation enable to give objects and shapes new shape, position or size ***(u)***	**8.7.1.1** define Transformation	**1.** reflect the given shapes using the given mirror line. 
8.7.2 understand that there are four methods that can be used to transform an object or shape ***(u)***	**8.7.2.1** identify and define the four methods that can be used to transform an object or shape: *Translation, Reflection, Rotation and Enlargement*	
TRANSLATION **8.7.3** understand Translation in terms of its movements ***(u)***	**8.7.3.1** define Translation	
8.7.4 describe the movement of an object that is being translated without changing the size and shape of the objects ***(u)***	**8.7.4.1** describe the translations of objects using 'Up, Down, Left and Right.' **8.7.4.2** determine the translation of objects by describing the movement of the object	**2.** (i) write down the coordinates of each vertex of the given shape. (ii) reflect the given using x-axis, as the mirror line to find the image (iii) write the coordinates of vertices of the the reflected shape. 
REFELECTION **8.7.5** understand reflection in terms of the Image, Mirror Line (Line of Reflection) and Line of Symmetry ***(u)***	**8.7.5.1** define Reflection **8.7.5.2** identify the properties of Reflection	
8.7.6 know how to reflect objects using the Mirror Line ***(k)***	**8.7.6.1** reflect objects with the Mirror Line and identify the new position of the images	
8.7.7 know how to identify the Line of Symmetry in shapes ***(k)***	**8.7.7.1** identify the Line of Symmetry in objects and shapes	
ROTATION **8.7.8** understand that objects can change their positions through Rotation ***(u)***	**8.7.8.1** define Rotation **8.7.8.2** identify properties of rotation - *Centre (point) of Rotation, Directions: Clockwise or Anticlockwise, and Amount of angle in a turn* **8.7.8.3** rotate objects with their given centre of rotations, directions and amount of degrees for their turns	

Subject: MATHEMATICS	Year: 8	
Strand: GEOMETRY		
Sub-strand: 8.7 TRANSFORMATIONS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
ENLARGEMENTS AND REDUCTIONS **8.7.9** understand that shapes or objects can either be enlarged or reduced with a given scale factor ***(u)***	**8.7.9.1** define Enlargement and Reductions. *Enlargement- Increase the size of an object.* *Reduction is - Decrease the size of an object.*	**3.** rotate 180° in an anticlockwise direction (180°) about O. 
8.7.10 know how to Enlarge and Reduce shapes and objects using Grids ***(k)***	**8.7.10.1** enlarge shapes or objects using either big or small grids	
8.7.11 know how to Enlarge and Reduce shapes and objects using Scale Factor ***(k)***	**8.7.11.1** find the scale factor for the enlargement or reduction of objects **8.7.11.2** enlarge shapes or objects using scale factors	**4.** rotate 270° in an anticlockwise direction (270°) about O. 
EXPLORING SIMILAR AREAS AND VOLUMES **8.7.12** understand that areas or volumes of shapes can be increased or decreased with given scale factors ***(u)***	**8.7.12.1** find areas and volumes of shapes **8.7.12.2** enlarge areas and volumes of shapes by given scale factors	
8.7.13 know that the enlarged and reduced areas and volumes of shapes create a relationship between old and new amounts ***(k)***	**8.7.13.1** identify the relationships between the scale factors for length and volumes	
CONGRUENT SHAPES **8.7.14** understand that if two shapes have same lengths of sides and same size angles then they are congruent ***(u)***	**8.7.14.1** define the term Congruent **8.7.14.2** compare shapes and objects to find which of those shapes are similar **8.7.14.3** describe transformation of objects to see which of those transformation that had occur	**5.** write the coordinates of each vertex on the given shape and the coordinates of the vertices of the image after reflection using the y axis. 

Subject: MATHEMATICS **Year: 8**

Strand: ALGEBRA

Sub-strand: 8.8 EQUATIONS AND INEQUATIONS (10 periods)
An Equation is an expression of equality between known to unknown qualities represented by pronumerals or variables. An inequation is an expression of relationship where a pronumeral represents a range of values. Number lines are used to represent inequation. Equations are solved by a range of methods; Simple inspection, Flow chart and Inverse operations are used to find the unknown. Inequations are solved with similar methods where the solutions are given in range of values. These can be represented on number line.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
SOLVING EQUATIONS BY INSPECTION **8.8.1** understand that an equation with one unknown can be easily solve to make the statement true ***(u)***	**8.8.1.1** solve simple equation by inspection	**1.** solve the following equations by inspection: **(a)** x − 7 = 9 **(b)** s − 8 = 11 **(c)** b − 5 = 8 **(d)** y − 13 = 7 **(e)** m − 13 = 14 **(f)** a − 18 = 20 **(g)** e −24 = 6 **(h)** f − 9 = 11
SOLVING EQUATION WITH FLOW CHART **8.8.2** know how to find the unknown using flow chart ***(k)***	**8.8.2.1** solve equations with one (1) unknown using 'flow chart' method	**2.** solve these equations. **(a)** 4 x p = 8 **(b)** 9 x q = 54 **(c)** 2 x r = 18 **(d)** 7s = 21 **(e)** 10r = 90
SOLVING EQUATION BY INVERSE OPERATION **8.8.3** know how to perform "inverse operations" of an equation to find the value of an unknown ***(k)***	**8.8.3.1** solve equations using method of 'Inverse Operations'	**3.** solve these equations. **(a)** 6x = 30 **(b)** x – 4 = 13 **(c)** x + 10 = 17 **(d)** x/3 = 7 **(e)** 3x = 12
SOLVING TWO – AND THREE STEP EQUATIONS **8.8.4** know how to solve for pronumerals using the two – and three – step method ***(k)***	**8.8.4.1** solve equations using two – and three – steps equations	**4.** Mathew's and Cathy's age add up to 27. Cathy's age is 14. Let x be Mathew's age. **(a)** write an equation to show the ages of the two people. **(b)** solve the equation to find out Mathew's age.
INEQUATIONS **8.8.5** understand that Inequation refers to the relationships between numbers, groups of numbers, variable or groups of variables when they are compared ***(u)***	**8.8.5.1** define Inequation Inequation – is an expression of relationship where a pronumeral represents a range of values.	**5.** solve. **(a)** $\frac{2x}{3} + 8 = 12$ **(b)** $\frac{4p}{5} - 2 = 6$
8.8.6 know how to use the inequality symbols: <, >, ≥, ≤ to express algebraic statements ***(k)***	**8.8.6.1** use inequality symbols: <, >, ≥, and ≤ to write the relationships between expressions	**6.** the cost in dollars of parking a car in the car par for t hours is given by the rule C = 3t – 2 **(a)** how much does it cost to park the car in 1 hour?

Subject: MATHEMATICS	Year: 8	
Strand: ALGEBRA		
Sub-strand: 8.8 EQUATIONS AND INEQUATIONS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
8.8.7 understand that the number line can be used to represent inequations statement ***(u)***	**8.8.7.1** use number line to represent the inequation expressions	
8.8.8 know how to apply the 'inverse operation' procedures to inequations to make the statement true ***(k)***	**8.8.8.1** solve inequation problems applying the inverse operation procedures **8.8.8.2** solve word problems	

Subject: MATHEMATICS **Year: 8**

Strand: NUMBERS

Sub-strand: 8.9 INDICES (10 periods)
The term Index (plural: Indices) has been used in mathematics extensively but perhaps the most frequent sense of the usage of index is where the index number is superscript to a base. The superscript indices are often used to indicate how many times the base would multiply itself. It is a notation of expressing the number of times a number is multiplied by itself.

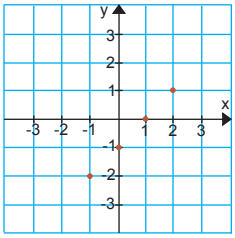
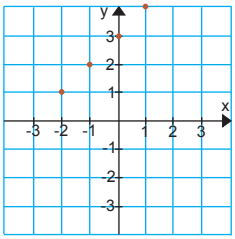
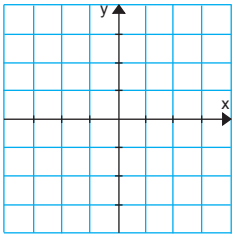
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
INDEX NUMBERS **8.9.1** understand that numbers can be expressed in many ways such as Index Numbers ***(u)***	**8.9.1.1** identify Index Number and its features *Index Numbers are formed when numbers are multiplied by themselves twice or more* Base → a^3 ← Power /Index number	**1.** write the following in index form: **(a)** 3×3 **(b)** 5×5×5×5 **(c)** 1×1×1×1×1×1 **(e)** 2×2 **(f)** 9×9×9×9×9 **(g)** 7×7×7 **(h)** 0×0×0×0×0×0×0×0
8.9.2 know how to express numbers in an index notations ***(k)***	**8.9.2.1** write numbers in index notation **8.9.2.2** expand index numbers into expanded form **8.9.2.3** expand and evaluate numbers given in an Index form.	**2.** write the following in expanded form. **(a)** 57 **(b)** 46 **(c)** 73 **(d)** 96 **(e)** 104 **(f)** 37
EXPLORING INDEX LAWS **8.9.3** understand that there are Laws that must be used when dealing with Indices ***(u)***	**8.9.3.1** identify some of the Laws that are used to manage Indices when they are computed ***Rules:*** *1. Same Base when multiply, ADD Powers* *2. Same Base when divide, SUBTRACT Powers* *3. Square root of numbers is the same as a Base with the Power of ½*	**3.** simplify the following. **(a)** 52×53 **(b)** 37×3 **(c)** 64×62 **(d)** 45×42 **(e)** 92×97 **(f)** 175×176 **4.** simplify the following. **(a)** 74÷ 72 **(b)** 39÷ 34 **(c)** 28÷ 25 **(d)** 134÷ 132 **(e)** 176÷ 173 **(f)** 258÷ 255
INDEX LAWS WITH ALGEBRAIC TERMS **8.9.4** know how to simplify Indices using the four Index Laws algebraically ***(k)***	**8.9.4.1** simplify indices using Index Laws ▪ $a^n \times a^p = a^{n+p}$ ▪ $a^n \div a^p = a^{n-p}$ ▪ $b^1 = b$ ▪ $b^0 = 1$	**5.** find the value of the following. (i) -33× 42 (ii) (-2)4 × (-3)2 (iii) -25× -52 **6.** Hayden and Tao were arguing about the solution to 33× 33 + 33× 33. Hayden said it was 2 × 36 and Tao said it was 186. Who was correct, and why?
MANAGING BRACKETS: OTHER INDEX LAWS **8.9.5** know how to use and apply three (3) extra Index Laws that involve brackets ***(k)***	**8.9.5.1** expand the bracket with indices and simplify or evaluate them using the Index Laws with Brackets. ▪ $(b^n)^p = b^{n \times p}$ ▪ $(a \times b)^n = a^n \times b^n$ ▪ $\left(\frac{a}{b}\right)^p = \frac{a^p}{b^p}$	

Subject: MATHEMATICS	Year: 8	
Strand: NUMBERS		
Sub-strand: 8.9 INDICES (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPLORING SCIENTIFIC NOTATION **8.9.6** understand that very big and very small numbers can be simplified by expressing them using scientific notation ***(u)***	**8.9.6.1** define Scientific Notation **8.9.6.2** identify Scientific Notation Numbers ***Scientific Notation*** *– Numbers that are written with the use of the decimal point and a 'base 10' with a power.*	**7.** expand the brackets in the following. **(a)** $(4 \times 3)^2$ **(b)** $(2 \times 5)^3$ **(c)** $(3 \times 2)^5$ **(d)** $(4 \times 7)^4$
8.9.7 know how to write very big and small numbers in scientific notation ***(k)***	**8.9.7.1** convert ordinary very big numbers to scientific notation **8.9.7.2** convert very small numbers in decimal (less than 1) to scientific notations	**8.** evaluate the following. **(a)** 7^0 **(b)** 20^0 **(c)** 22×6^0 **(d)** -3^0 **(e)** -6×5^0
EXPLORING GRAPHS OF EXPONENTIAL **8.9.8** understand the numbers that are fast increase, which sometimes double are said to have exponential growth ***(u)***	**8.9.8.1** complete tables of exponential increase and express them in an exponential graph	**9.** simplify if possible, then evaluate. **(a)** $\frac{(-3)^6}{(-3)^5}$ **(b)** $\frac{10^5 \times 10}{-10^2}$

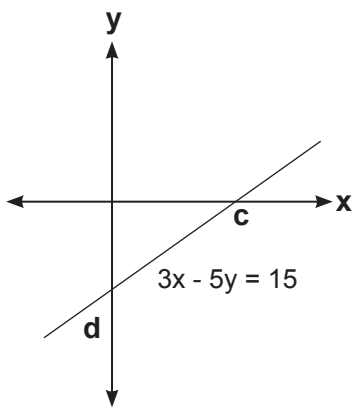
Subject: MATHEMATICS **Year: 8**

Strand: ALGEBRA

Sub-strand: 8.10 COORDINATE PLANE (15 periods)
Coordinate plane is made up of two axes, namely y and x axes. The coordinate plane enables us to specify each point by a pair of numerical coordinates from the x and y axes. The coordinates can also be defined as the positions of the perpendicular projections of the point onto the two axes, expressed as a signed distances from the origin. The plane also enables us to plot and locate points on the graph. This would enable us to identify the rules that determine the positioning of the points on the graph.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
PLOTTING POINTS ON THE PLANE **8.10.1** know the coordinate plane and its features and parts ***(k)***	**8.10.1.1** identify and naming different parts of the Coordinate Plane *: x and y axes, and origin*	**1.** list the coordinates of each of the plotted points, then write down the rules that relate y to x:
8.10.2 know how to name coordinates and plot coordinates on the plane ***(k)***	**8.10.2.1** plot coordinate pairs on the plane **8.10.2.2** name coordinate that are given on the plane	**(a)** 
LINEAR PATTERNS AND SIMPLE RULES **8.10.3** understand how groups of points in alinear alignment have rules that relates x and y values ***(u)***	**8.10.3.1** find the coordinates of points that are in linear alignment **8.10.3.2** find the rules that relates the x and y values that are in a linear alignment **8.10.3.3** find the rules for coordinates of x and y values that are given in tables	**(b)** 
COMBINATION RULES **8.10.4** understand that various can be made to determine a value for "y" ***(u)***	**8.10.4.1** finding rules that combine all the pronumerals together to give a value for "y"	
8.10.5 know how to find the rule that relates the x and y values that are given in tables and graphs ***(k)***	**8.10.5.1** find the rules that relate values of y to x in the given in tables **8.10.5.2** find the rule or equations for given linear graphs	**2.** draw the graphs of y = – 3 and x = 1 on the same plane. 
PLOTTING A LINE USING A RULE **8.10.6** know how to plot coordinate pairs that create a straight line graph ***(k)***	**8.10.6.1** define Linear Relation **8.10.6.2** complete given tables using given rules then plot the points on a set of Cartesian axes	
8.10.7 know how plot coordinates on the coordinate plane ***(k)***	**8.10.7.1** plot coordinates that are given using given rules	

Subject: MATHEMATICS	Year: 8
Strand: ALGEBRA	
Sub-strand: 8.10 COORDINATE PLANE (15 periods)	

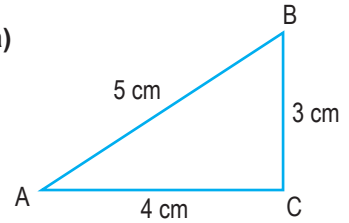
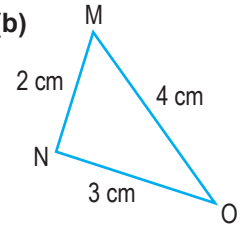
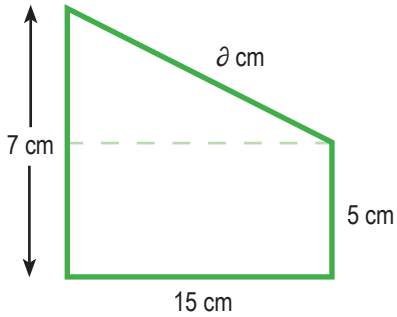
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	*Learners should be able to*	*Learners can be assessed on*
HORIZONTAL AND VERTICAL LINES **8.10.8** understand how Horizontal and Vertical lines created ***(u)***	**8.10.8.1** identify the properties of Horizontal and Vertical linear graphs	**3.** write down the equation of the line that is.. **(a)** parallel to the x – axis and pass through (1, 9) **(b)** parallel to the y – axis and passes through (– 2, 4)
8.10.9 know how to find the equations and sketch graphs of Horizontal and Vertical lines ***(k)***	**8.10.9.1** find equations of vertical and horizontal linear graphs and sketch their graphs	
USING X AND Y INTERCEPTS **8.10.10** know how to use the "x" and "y" intercepts to graph a straight line graph ***(k)***	**8.11.10.1** sketch or plot linear graphs by finding the y and x intercepts	**4.** find the y – intercept for the following equations **(a)** Y = 2x – 8 **(b)** Y = 3x + 6 **(c)** Y = -x - 7 **(d)** Y = ½ x + 4
GRADIENT OF STRAIGHT LINES **8.10.11** understand Gradient and how it is determined ***(u)***	**8.10.11.1** define gradient **8.10.11.2** determine Gradient by dividing the **rise** by the **run** between two convenient points on the line Formula: $m = \frac{\text{Rise}}{\text{Run}}$	**5.** write down the value of **c** and **d**. 
8.10.12 know how to calculate the gradient of a straight line graph ***(k)***	**8.10.12.1** calculate gradient of given graphs, either positive or negative	
THE GRADIENT and Y – INTERCEPT **8.10.13** know how to use the Gradient – Intercept method to graph straight line graph ***(k)***	**8.10.13.1** identify the equation for straight line: y = mx + c , then find gradient and the y-intercept	
8.10.14 know how to sketch Linear Graphs ***(k)***	**8.10.14.1** sketch linear graphs by finding the gradient and the y – intercept method	
FINDING EQUATIONS OF LINES **8.10.15** know how to find the equation of given linear graphs ***(k)***	**8.10.15.1** find linear equation by substituting values to 'm' and 'c' in the equation **8.10.15.2** write equation for given linear graphs using the gradient –intercept method	

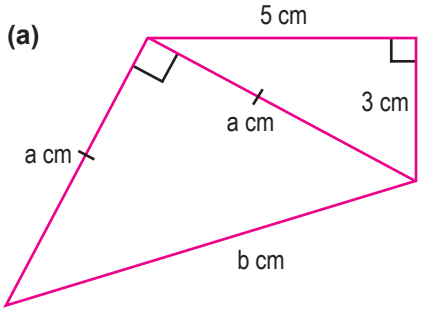
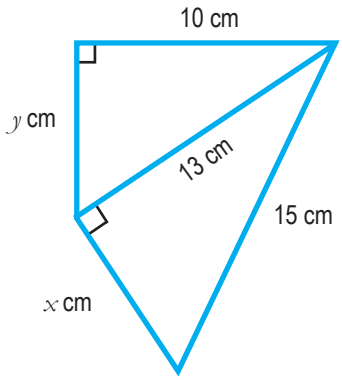
Subject: MATHEMATICS **Year: 8**

Strand: TRIGONOMETRY

Sub-strand: 8.11 PYTHAGORAS (15 periods)

The Pythagoras Theorem is a rule that is used to find the dimensions of any given right – angle triangle of any sizes. It was named after the Greek mathematician Pythagoras who is credited with its discovery and its proof. The theorem states that: The sum of the areas of the two squares on the two shorter sides (a and b) of a right – angle triangle is equal to the area of the square on the hypotenuse (c) – longer side. In symbol; $c^2 = a^2 + b^2$

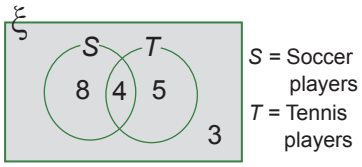
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPLORING THE PYTHAGORAS' THEOREM **8.11.1** understand the Pythagoras Theorem and how it is formed ***(u)***	**8.11.1.1** state the Pythagoras Theorem and its components: $h^2 = a^2 + b^2$ **8.11.1.2** measure the lengths of the sides of various right – angle triangles and use them on the Pythagoras rule	**1.** use the converse of Pythagoras' Theorem to determine whether each of the following triangles is a right-angled triangle. **(a)**  **(b)** 
STATING THE PYTHAGORAS' THEOREM **8.11.2** recognise the Pythagoras Theorem and how it is used to relate ALL the 3 sides of the Right-angle Triangle ***(s)***	**8.11.2.1** identify the Pythagoras Theorem on given right-angled triangle **8.11.2.2** use the Pythagoras theorem to find other missing sides of the right angle triangle	
FINDING THE LENGTH OF THE HYPOTENUSE **8.11.3** know how to use the Pythagoras Rule to find the length of the Hypotenuse ***(k)***	**8.11.3.1** identify and define Hypotenuse **8.11.3.2** calculate the length of the Hypotenuse using the Pythagoras Theorem	
PYTHAGOREAN TRIADS **8.11.4** understand how Pythagorean Triads are formed and how they are applied using the Pythagoras theorem ***(u)***	**8.11.4.1** define Pythagorean Triad **8.11.4.2** identify 3 set of numbers that form Pythagorean Triads eg: 3, 4, 5, 9,12,15 etc..	**2.** calculate the length of the hypotenuse in the following triangles. 
FINDING THE LENGTH OF THE PERPENDICULAR SIDE **8.11.5** know how to use the Pythagoras Rule to find the lengths of any of the two shorter sides of the right-angle triangle ***(u)***	**8.11.5.1** find the length of the missing sides of given triangles using the Pythagoras Theorem **8.11.5.2** solve practical questions	
PYTHAG0RAS THEOREM IN EXACT FORM **8.11.6** know how to use Pythagoras theorem to make irrational numbers to be in exact form make **Irrational Numbers** to ***(k)***	**8.11.6.1** define the following terms: *Irrational Numbers, Exact form and Surds*	
8.11.7 know how to find the missing sides of the right-angle triangle leaving the answer in exact form (Surds) ***(k)***	**8.11.7.1** dind the length of the missing sides, expressing the answer in **exact form** (Surds or square root)	

Subject: MATHEMATICS	Year: 8	
Strand: TRIGONOMETRY		
Sub-strand: 8.11 PYTHAGORAS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
COMPOSITE SHAPES **8.11.8** understand that shapes can be made up of many different shapes ***(u)***	**8.11.8.1** define composite shape and identify some composite shapes	**3.** use Pythagoras' Theorem to find the value of the unknown length in each of the following.
8.11.9 know how to find lengths of composite shapes ***(k)***	**8.11.9.1** find missing lengths that are represented by given pronumerals of given composite shapes	**(a)** 
COORDINATE GEOMETRY **8.11.10** understand that Pythagoras Theorem can be used to find the distance between two points on a linear graph ***(u)***	**8.11.10.1** calculate the lengths of line segments between two points using the Pythagoras Theorem	
PYTHAGORAS IN THREE (3) DIMENSIONS **8.11.11** know how to calculate the dimensions of the cross-sections of solids that reveal right-angle triangle ***(k)***	**8.11.11.1** calculate the dimensions of any given cross-sections of solids using the Pythagoras Theorem	**4.** find the value of the variable, correct to two decimal places, in each of the following diagrams.
EXPLORING AREAS OF TRIANGLE **8.11.12** investigate different approaches that can be used to find the area of a squares by breaking the shape into small triangles ***(s)***	**8.11.12.1** investigate and find areas of squares and triangles that make up a big square shape using formulae to find area of triangles and squares	

Subject: MATHEMATICS **Year: 8**

Strand: PROBABILITY AND STATISTICS

Sub-strand: 8.12 PROBABILITY AND SETS (15 periods)
Set is a collection of things called elements which can be collected and group together according to certain criteria that indicate common features. It can be used to find chances of events occurring. Probabilities can be calculated by considering all the equal chances of an event to occur. The chance for an event to occur in set can be calculated by obtaining an element out of the total sample in an universal set.

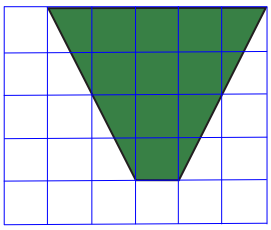
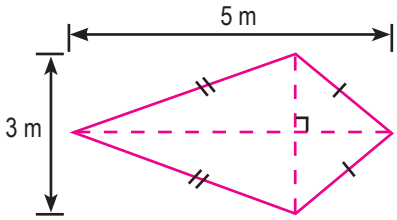
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
EXPLORING SETS **8.12.1** know how objects can be grouped together using sets ***(k)***	**8.12.1.1** group objects, elements etc according to given criteria	**1.** the Venn diagram below shows the sports preferences for a class of Year 8 students. Use it to find the following: 
8.12.2 know how to group elements or objects with certain criteria using circles ***(k)***	**8.12.2.1** group elements or objects into different classes or groups using circles	
SETS AND VENN DIAGRAMS **8.12.3** understand how Venn Diagrams can be used to group elements of the same type ***(u)***	**8.12.3.1** define Sets **8.12.3.2** group together elements and put them together as sets	
8.12.4 know how to write Sets using 'Curly Brackets' with Capital Letters to name them ***(k)***	**8.12.4.1** write sets of elements by using the curly brackets and name Sets using Alphabetical Letters	**(a)** how many students are in the class? **(b)** how many students play: i. soccer? ii. only tennis? iii. soccer and tennis? iv. neither soccer nor tennis?
8.12.5 understand 'elements' and how they are represented using sets and symbols ***(u)***	**8.12.5.1** define and Identify elements of sets **8.12.5.2** identify the symbol for Element: *Symbol for Element:* $\in$	**2.** a class consists of 26 students. Ten study Business Studies and the rest study Agriculture. What is the probability that a student chosen at random studies: (a) Business studies (b) Agriculture
8.12.6 know that a set that includes ALL possible outcomes is known as Universal Set ***(k)***	**8.12.6.1** define Universal Set and identify its symbol: *Universal Set symbol:* ξ	
8.12.7 understand that some elements may not be shown in the group set ***(u)***	**8.12.7.1** define Complement of a set and identify its symbol **8.12.7.2** identify elements that are complement to the main set	**3.** if I spin a five-sided spinner with numbers 1, 2, 3, 4, 5, what is the probability of: **(a)** not getting a 2 **(b)** not getting a 1 or a 2?
8.12.8 understand that a set that do **not** have any elements in it is sad to be Empty Set or Null Set ***(u)***	**8.12.8.1** define Empty or Null Set and identify its symbol: N = { } or N = Ø	
8.12.9 understand that when two sets have elements that are common we say that they Intersect ***(u)***	**8.12.9.1** define Intersection and identify its symbol: $\cap$ **8.12.9.2** find elements that are intersected in given sets	**4.** my fruit bowl contains five bananas, four apples, one orange and five peaches. If I choose one piece of fruit from the bowl at random, find: **(a)** Pr(a banana) **(b)** Pr(a peach or an apple) **(c)** Pr(not an apple) **(d)** Pr(not an orange or a banana).
8.12.10 understand that when two sets are combined together we refer to them as Union ***(u)***	**8.12.10.1** define Union and identify its symbol: $\cup$ **8.12.10.2** find sets that are in union	

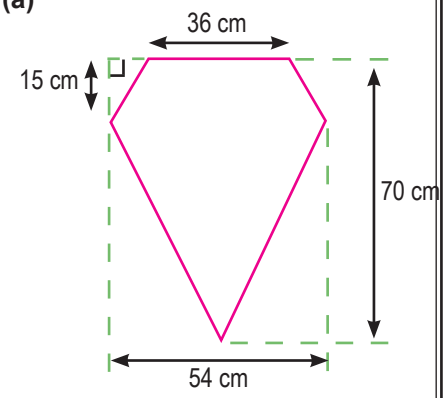
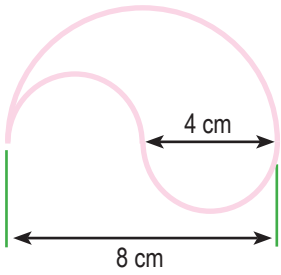
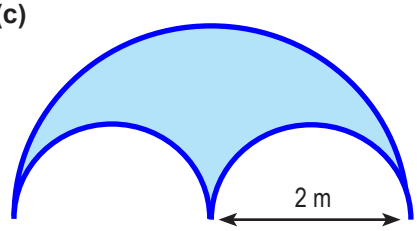
Subject: MATHEMATICS	Year: 8	
Strand: PROBABILITY AND STATISTICS		
Sub-strand: 8.12 PROBABILITY AND SETS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
SETS AND PROBABILITY **8.12.11** know how to find the probabilities of an outcome using set notation ***(k)***	**8.12.11.1** calculate the probability of an outcome from sets using the formula	**5.** the numbers from one to twenty are written on separate counters and placed in a hat. If one counter is drawn at random, find: **(a)** Pr(a number between 5 and 11) **(b)** Pr(a number with a 1 in it) **(c)** Pr(a number less than 30) **(d)** Pr(a multiple of 5) **(e)** Pr(not a multiple of 5) **(f)** Pr(not odd).
SAMPLE SPACE GRIDS **8.12.12** understand that Grid can be used to represent the total outcome or sample space of an event ***(u)***	**8.12.12.1** define and identify Sample Space of compound events **8.12.12.2** use grid to represent Sample Space of simple events occurring	
8.12.13 know how to calculate probabilities of compound events using Grid ***(k)***	**8.12.13.1** calculate the probabilities of compound events using grid	
TREE DIAGRAMS **8.12.14** know how to use 'Tree Diagram' to display sample space for compound events of three or more events ***(u)***	**8.12.14.1** use tree diagram to find probabilities of events **8.12.14.2** construct tree diagrams to display sample spaces of compound events then calculate their probabilities	
ESTIMATING PROPORTIONS USING SAMPLING **8.12.15** understand how sampling method is used to estimate quantities from large group of quantities ***(u)***	**8.12.15.1** find the probabilities of an events occurring in a sample proportionate to the total quantities, groups, population etc	

Subject: MATHEMATICS **Year: 8**

Strand: NUMBERS

Sub-strand: 8.13 AREA AND VOLUME (15 periods)
Determining the space in a 2 – dimensional enclosed figure is normally done by counting the number of square units that fit exactly into the figure. Grids have been used to estimate the areas of irregular shapes. With regular polygon shapes rules are derived to determine the quantities of given spaces where various polygon shapes have different rules to determined their areas. Volume is no exception as the capacity is being determined by counting the number of small cubes that would fit exactly inside the enclosed spaces.

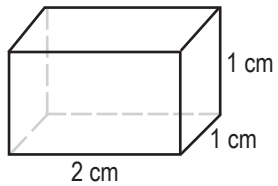
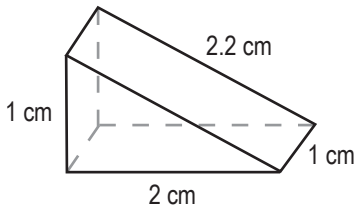
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
USING GRID TO FIND AREA **8.13.1** understand how area is calculated and determined using grid on regular and irregular shapes ***(u)***	**8.13.1.1** define area **8.13.1.2** estimate areas of given shapes by counting the number of unit squares that would fit inside the shape	**1.** use the grid to estimate the area of the following shapes. 
AREAS OF RECTANGLE **8.13.2** know how to use formula to calculate areas of various Rectangle ***(k)***	**8.13.2.1** identify Rectangle and calculate its area using the formula	
AREAS OF PARALLELOGRAM **8.13.3** understand that parallelogram is made out from rectangle being tilted to the side ***(u)***	**8.13.3.1** identify parallelogram and its properties	**2.** find the area of the given shape. 
8.13.4 know how to calculate the area of various Parallelograms ***(k)***	**8.13.4.1** use the formula to calculate the area of Parallelograms *Area = base × height*	
AREAS OF TRIANGLE **8.13.5** know how to determine the area of various Triangles ***(k)***	**8.13.5.1** identify triangle shape and its properties **8.13.5.2** use the formula to calculate the area of any Triangles *Triangle: Area = ½ Base × Height*	
AREA OF TRAPEZIUM **8.13.6** understand how the formula to calculate the area of any trapezium shape is being formulated ***(u)***	**8.13.6.1** identify trapezium shape and its properties **8.13.6.2** formulate the rules or formula that can be used to calculate the area of a trapeziums	**3.** a trapezium with perpendicular height 8 cm and parallel sides measuring 10 cm and 18 cm has an area of.
8.13.7 know how to find the area of trapeziums ***(k)***	**8.13.7.1** use the formula to calculate the areas of trapezium *Area = ½ (A + B) × Height*	
AREAS OF IRREGULAR SHAPES **8.13.8** understand that all shapes are not regular, some are irregular and don't fit exactly into the square grid ***(u)***	**8.13.8.1** estimate the areas of irregular shapes using unit squares	

Subject: MATHEMATICS	Year: 8	
Strand: NUMBERS		
Sub-strand: 8.13 AREA AND VOLUME (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
AREAS OF CIRCLE **8.13.9** know how to use the formula to find the area of any given circles ***(k)***	**8.13.9.1** calculate the area of various circles using the formula: *Area* $=\pi r^2$	**4.** find the area of these composite shapes. **(a)** 
AREAS OF COMPOUND SHAPES **8.13.10 r**ecognise shapes that are called compound shapes and their properties ***(s)***	**8.13.10.1** define and identify compound shapes **8.13.10.2** use formulae from different shapes to calculate the area of compound shapes	
TOTAL SURFACE AREA **8.13.11** understand that shapes have surface area and can be determined ***(u)*** **8.13.12** know how to calculate the total surface area of the given prisms ***(k)***	**8.13.11.1** define and identify Prism shapes and their surface areas **8.13.12.1** calculate the surface area of different faces of the prisms **8.13.12.2** calculate the total surface area of various shapes	**(b)** 
VOLUME OF PRISMS **8.13.13** understand Volume and how it is determine ***(u)*** **8.13.14** know how to use formula to calculate the area of given solids ***(k)***	**8.13.13.1** define volume **8.13.14.1** calculate the volume of various prisms and cuboids by using the formula: *Volume* $= L \times W \times H$	**(c)** 

Subject: MATHEMATICS **Year: 8**

Strand: GEOMETRY

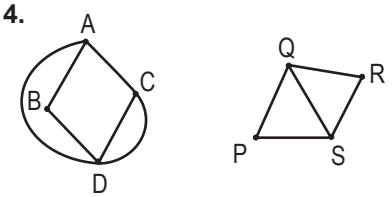
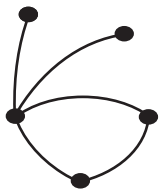
Sub-strand: 8.14 POLYHEDRA AND NETWORKS (15 periods)
Polyhedron is a three-dimensional shape that is made up of a finite number of polygonal faces which are parts of planes; the faces meet in pairs along edges which are straight - line segments, and the edges meet in points called vertices. Any polyhedron can be built up from different kinds of element or entity, each associated with a different number of dimensions that create network for various shapes. Polyhedra are often named according to the number of faces they hold such as tetrahedron (4), pentahedron (5), hexahedron (6), heptahedron (7), triacontahedron (30), and so on.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
SOLID SHAPES **8.14.1** know that Solid Shapes (3-Dim) can be drawn or represented on 2-Dimensional surfaces using dotted lines ***(u)***	**8.14.1.1** define and identify solid shapes **8.14.1.2** find and identify some of the objects, plants and others in nature and our surroundings that have some of the Solid Shapes **8.14.1.3** draw and sketch solids on to 2-dimensional to show 3-D solids	**1.** using one-point or two-point perspective, draw the following: **(a)** a rectangular prism such as your textbook or a box of tissues **(b)** the front of your home or your school **(c)** your dream home **(d)** a highway scene with a road, trees and buildings
NETS FOR SOLID SHAPES **8.14.2** understand how 2-dimensional objects are cut and fold to get solid shapes and their nets ***(u)***	**8.14.2.1** draw and Sketch nets of various solids on to hard cardboards **8.14.2.2** identify given nets of solids that would produce corresponding solids **8.14.2.3** draw and cut-out nets of various solid and fold them to create solid shapes	**2.** draw a net for each of the following shapes. **(a)** 
DRAWING 3D SHAPES **8.14.3** know how to use draw 3D solids on dotted papers that would visualize 3 views ***(k)***	**8.14.3.1** sketch and draw 3-D solid shapes using dotted lines to show the sides and corners of the shape	**(b)** 
PERSPECTIVE DRAWINGS **8.14.4** understand how lines can be used to draw and sketch pictures on 2-D that would give 3-Dimensional objects or pictures ***(k)***	**8.14.4.1** identify some of the drawings and paintings that have perspective drawings with 3-D view **8.14.4.2** draw shapes and pictures using perspective drawing starting with One – point perspective and Two – point perspective	

Subject: MATHEMATICS	Year: 8

Strand: GEOMETRY

Sub-strand: 8.14 POLYHEDRA AND NETWORKS (15 periods)

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
POLYHEDRON DEFINITIONS **8.14.5** know how to identify those shapes that are Polyhedron ***(k)***	**8.14.5.1** define Polyhedron **8.14.5.2** identify and define different parts of Polyhedron Shapes: *Edge, Vertex, faces*	**3.** a cylinder has 3 faces, 2 edges and no vertices. Write down the number of faces, edges and vertices for a cone.
8.14.6 know the 5 regular Polyhedra with faces that are congruent regular polygons with the same number of faces meeting at each vertex ***(k)***	**8.14.6.1** name and identify the 5 regular Polyhedra shapes which is also called Plutonic Solids	**4.** 
8.14.7 know how to draw a Planar network for 3-Dimensional shapes ***(k)***	**8.14.7.1** define Planar Network **8.14.7.2** draw Planar network for 3D shapes	**(a)** make a list of even vertices in these network **(b)** make a list of odd vertices in these network
8.14.8 understand what an **Order of Vertex** is ***(u)***	**8.14.8.1** define an Order of Vertex **8.14.8.2** state the Order for each Vertex and the total Order for a Network	**5.** draw a network that has
NETWORK AND THEIR APPLICATIONS **8.14.9** understand that a network is formed when vertices and edges are drawn together ***(u)***	**8.14.9.1** define and differentiate the followings: Network, Vertices (nodes), Edges (Path), Traversal and Region	**(a)** 2 odd and 1 even vertices **(b)** All odd vertices **(c)** All even vertices
8.14.10 know how to determine the number of Edges (degrees) – ODD or EVEN that attach to a vertex ***(k)***	**8.14.10.1** determine the number of degrees for a network and state whether those vertex have Odd or Even degrees **8.14.10.2** find routes for given diagrams or maps **8.14.10.3** draw and construct Network with given vertices and edges	**6.** decide whether this network is traversable or not. 

12.3 Secondary Mathematics Year 9 Syllabus

Subject: MATHEMATICS **Year: 9**

Strand: NUMBERS

Sub-strand: 9.1 NUMBER SYSTEM (15 periods)
Number system is made up of different groups or classification of numbers depending on the properties each class or group has. Top in the hierarchical order is Real Numbers which can be divided into Rational and Irrational. On one hand Rational numbers can further split to Integers and Fractions. An Integer is further divided into Negative integers and Natural numbers with Zero in the middle. On the other hand, Irrational numbers is divided into Surds and Transcendental numbers.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
THE REAL NUMBER SYSTEM **9.1.1** understand that Number System is made up of different types, class, groups of numbers ***(u)***	**9.1.1.1** identify and define different types of numbers that made up the Real Number System. *Rational numbers; Irrational numbers; Integers; Positive integers or natural numbers; Negative integers; Surds; Transcendental numbers*	**1.** list the first 10: **(a)** positive integers **(b)** negative integers **2.** list the first eight natural numbers. **3.** write five examples of: **(a)** surds **(b)** transcendental numbers
NATURAL NUMBERS AND INTEGER ARITHMETIC **9.1.2** understand Natural Numbers and distinguish them from other classes of numbers ***(u)***	**9.1.2.1** define Natural number **9.1.2.2** identify numbers or classes of numbers that are under natural numbers	**4.** find the sum of the first 50: **(a)** natural numbers **(b)** negative integers
9.1.3 know how to compute with Positive (+) and Negative (–) numbers when they are together by following the conventional rules for Addition, Subtraction, Multiplication and Division ***(k)***	**9.1.3.1** identify the *Operational Rules* that must be followed when computing with Positive and Negative numbers: - *Same Signs = Positive* - *Different Signs = Negative*	**5.** write the value of the following. **(a)** 2^3 **(b)** 3^4 **(c)** 5^2 **(d)** 10^6 **6.** imagine that you are standing at -4 on a large number line. Which number would you land on if you walked: **(a)** 7 places to the right **(b)** 5 places to the left?
9.1.4 know how to compute with numbers with different signs using BODMAS Rule ***(k)***	**9.1.4.1** evaluate problems that involve mixtures of Signs using the BODMAS and BIDMAS Rules **9.1.4.2** find Prime factors, Common factors and Highest common factors	**7.** a department store has 4 floors below ground level and 11 floors above ground. A shopper on the top level takes a lift to the bottom level, stopping every 3 floors to look around.
9.1.5 know how to used the Divisibility Rules to divide numbers with NO remainders ***(k)***	**9.1.5.1** identify and divide numbers that would **not** have remainders using the Divisibility Rules	**(a)** draw a diagram to represent the situation, clearly showing the lift and floor numbers. **(b)** how many times will the shopper stop on his way to the lowest floor? **(c)** list the floor numbers the shopper stops at.
SUBSTITUTION WITH WHOLE NUMBERS **9.1.6** know how pronumerals that are given in terms and expressions can be replaced with numbers and be evaluated ***(k)***	**9.1.6.1** evaluate expressions by substituting in values to replace the pronumerals	

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.1 NUMBER SYSTEM (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
RATIONAL NUMBER ARITHMETIC: FRACTIONS **9.1.7** understand that numbers that are expressed in the form of $\frac{a}{b}$ or fraction are rational numbers ***(u)***	**9.1.7.1** define and Identify Rational Numbers	**8.** calculate. **(a)** 4 + 7 − 9 **(b)** -2 + 5 − 1 **(c)** -15 + 23 − 8 **(d)** 6 + (-3) − (+10) **(e)** -7 − (-8) + 3 **(f)** 5 − (-14) − 20
9.1.8 know how to express Rational numbers in different types of fractions ***(k)***	**9.1.8.1** write and express numbers in *Proper fractions, Improper fractions, Equivalent fractions and Mixed Numbers* **9.1.8.2** evaluate fractions to find value to given pronumerals	**9.** evaluate the following without using a calculator and then check your answer with a calculator.
9.1.9 know how to estimate rational numbers ***(k)***	**9.1.9.1** estimate rational numbers	**(a)** $\frac{3\pi}{4} - \frac{2\pi}{2}$
RATIONAL NUMBER ARITHMETIC: DECIMALS **9.1.10** understand rational number of fractions can also be expressed as decimal numbers ***(u)***	**9.1.10.1** define decimal numbers **9.1.10.2** identify decimal numbers that are Terminating and Repeating **9.1.10.3** divide fractions to find decimals that terminate and those that repeat	**10.** simplify the following: **(a)** $\sqrt{8}$ **(b)** $\sqrt{32}$ **(c)** $\sqrt{45}$ **11.** expand the brackets and express in simplest form. **(a)** $\sqrt{3}(\sqrt{5} + \sqrt{2})$
9.1.11 know how to convert fractions to decimals and evaluate decimal questions ***(k)***	**9.1.11.1** convert fractions to decimals **9.1.11.2** evaluate Rational numbers that are decimals	**(b)** $\sqrt{5}(\sqrt{2} - \sqrt{7})$ **(c)** $\sqrt{3}(\sqrt{2} + \sqrt{5})$
SQUARE NUMBERS AND THEIR SQUARE ROOTS **9.1.12** understand that any rational numbers can be squared or can find their roots ***(u)***	**9.1.12.1** evaluate rational numbers by squaring them **9.1.12.2** evaluate rational numbers by taking their roots	**12.** simplify the followings. **(a)** $\frac{3\sqrt{6} \times \sqrt{5}}{\sqrt{2}}$
EVALUATING SURDS **9.1.13** understand that numbers that cannot be expressed as fractions are referred to as Irrational numbers and can be expressed using the root sign - $\sqrt{\ }$ ***(u)***	**9.1.13.1** define Surds **9.1.13.2** take the square roots of numbers to given decimal places	**(b)** $\frac{\sqrt{2} \times 5\sqrt{12}}{3\sqrt{6}}$ **(c)** $\frac{3\sqrt{3} \times 6\sqrt{12}}{\sqrt{6}}$

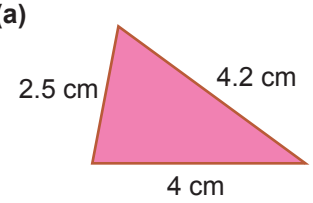
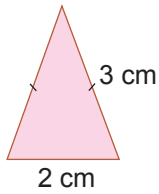
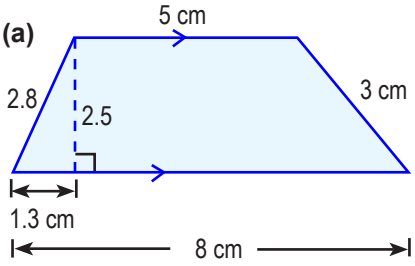
Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.1 NUMBER SYSTEM (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
ESTIMATING THE SIZE OF SURDS **9.1.14** understand that numbers expressed as surds can be estimated using perfect squared-numbers ***(u)***	**9.1.14.1** estimating the size of the Surds using Perfect Squared Numbers: *numbers that can take its root with no remainders* **9.1.14.2** indicate the positions of estimated surds using the Number Line	**13.** rationalise the denominator of the followings. **(a)** $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{3}}$
SIMPLIFYING SURDS **9.1.15** know how simplify numbers that are given in surds ***(k)***	**9.1.15.1** simplify Surds by splitting the surd into surd factors with one in perfect square then take the square root	**(b)** $\frac{\sqrt{3}+3}{\sqrt{2}}$
EXPRESSING ENTIRE SURDS **9.1.16** understand that simplified surds can all be expressed as entire surds ***(u)***	**9.1.16.1** express simplified surds as entire surds	**(c)** $\frac{\sqrt{3}-5}{\sqrt{2}}$
ADDING AND SUBTRACTING SURDS **9.1.17** know how to Add and Subtract Surds by collecting like terms ***(k)***	**9.1.17.1** group like Surds **9.1.17.2** simplify by adding and subtracting surds	**(d)** $\frac{2+\sqrt{3}}{\sqrt{5}}$
MULTIPLYING SURDS **9.1.18** understand that surds can be multiplied together ***(u)***	**9.1.18.1** evaluate Surd by multiplying corresponding numbers - outside numbers then numbers in the square root sign	
9.1.19 know how to expand and simplify surds ***(k)***	**9.1.19.1** expand and simplify surds with brackets	
DIVIDING SURDS **9.1.20** understand that surds can be simplified by dividing them ***(u)***	**9.1.20.1** simplify surds by dividing outside numbers and then numbers in the square root sign	

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.1 NUMBER SYSTEM (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
RATIONALISING DENOMINATORS **9.1.21** understand how fraction with a surd as the denominator can be rationalized ***(u)***	**9.1.21.1** rationalize the surd denominator of fraction by multiplying the numerator and the denominator by surd	
9.1.22 know how to Simplify fractions with a surd denominators ***(k)***	**9.1.22.1** rationalize the denominator then simplify	

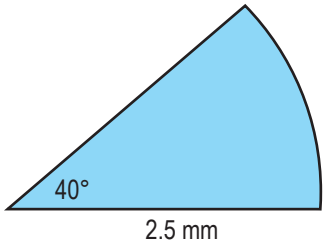
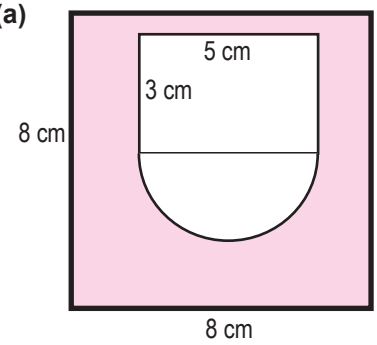
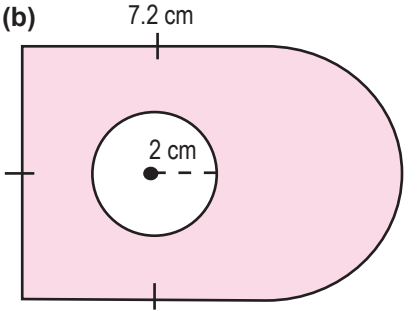
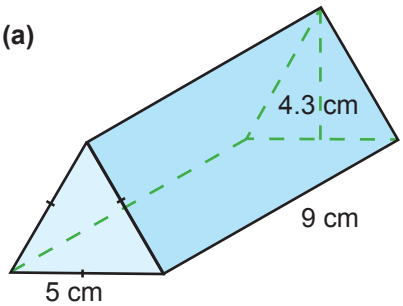
Subject: MATHEMATICS **Year: 9**

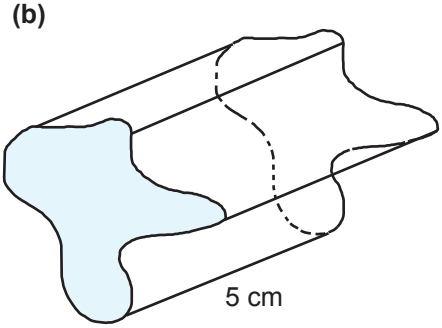
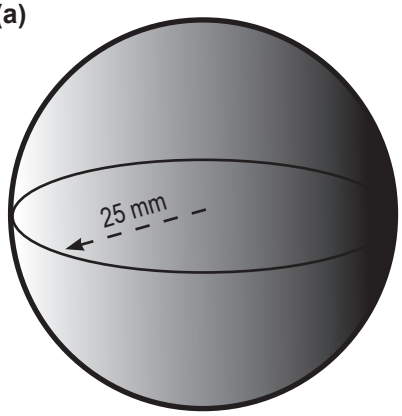
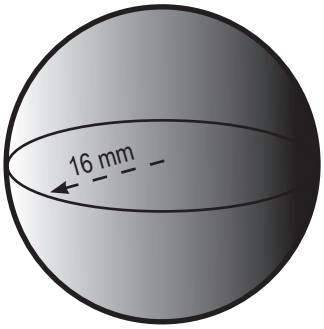
Strand: NUMBERS

Sub-strand: 9.2 MEASUREMENT (10 periods)
Measurement is the process of obtaining the magnitude of a quantity, such as length or mass, relative to a unit of measurement, such as a meter or a kilogram. A measurement answers the general question, "how many?", as in *how many* miles, or millimetres etc.. As measurement is basically about counting, measurement is conducted in numbers and is quantitative. There are two methods that are used in the world today to determine measurement. They are the imperial system which is used widely in USA, and the Metric system. They both have different units that represent different measurements.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
CONVERSION OF MEASUREMENTS UNITS **9.2.1** appreciate that metric units system enable us to converted from unit to another ***(a)***	**9.2.1.1** identify metric units that are used to measure the followings; *length, mass, area, volume, capacity, temperature, time, speed and mass*	**1.** change 2·5 metres to centimetres **2.** change 14 600 centimetres to kilometres
9.2.2 know how to convert one metric unit from one to another ***(k)***	**9.2.2.1** convert metric units from one to another	**3.** find the perimeter of these polygons. **(a)** 
PERIMETERS OF SHAPES **9.2.3** understand that the distance around any Shape can be measured and determined ***(u)***	**9.2.3.1** define perimeter	
9.2.4 know how to find the perimeter of given shapes and objects ***(k)***	**9.2.4.1** calculate the perimeter of given Shapes *Polygons, Quadrilaterals and other irregular polygon*	**(b)** 
EXPLORING THE ARC LENGTH OF CIRCLES **9.2.5** know how to identify the Arc Length of a circle ***(k)***	**9.2.5.1** define Arc Length of a circle **9.2.5.2** identify arc length of a circle and find its length	
CIRCUMFERENCE OF CIRCLES AND ARC LENGTHS **9.2.6** understand that circle have different names given to different parts of a circle ***(u)***	**9.2.6.1** identify parts of the circle **9.2.6.2** define Circumference of a circle	**3.** find the perimeter of the following. **(a)** 
9.2.7 know how to find the perimeter of given compound shapes and diagrams ***(k)***	**9.2.7.1** find the circumference and arc length of the circle given the; diameter and radius **9.2.7.2** calculate the perimeter of given compound shapes	
AREA UNITS **9.2.8** understand that different shapes have different area and can be determined using different metric units ***(u)***	**9.2.8.1** define Area **9.2.8.2** identify appropriate units that are used to measure area of different shapes and objects	

Subject: MATHEMATICS	Year: 9
Strand: NUMBERS	
Sub-strand: 9.2 MEASUREMENT (10 periods)	

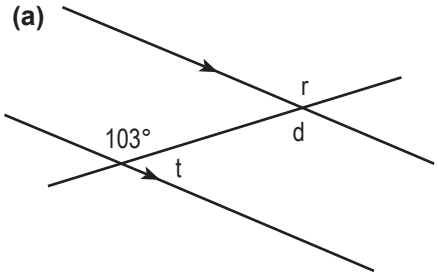
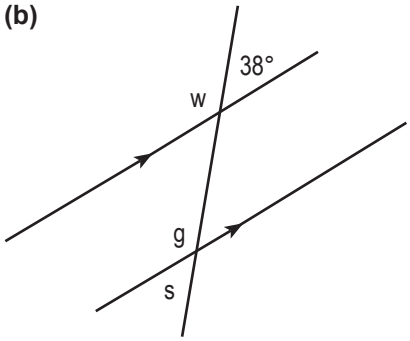
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.2.9 know how to convert metric units of area from one to another ***(k)***	**9.2.9.1** convert metric unit of Area from one to another using the given table	**(b)** 
AREAS OF SHAPES **9.2.10** recognise different formulas that can be used to calculate areas of different shapes ***(s)***	**9.2.10.1** identify various polygon shapes with corresponding formulas or rules that are used to calculate areas of shapes	
9.2.11 know how to calculate areas of different shapes with corresponding formulas ***(k)***	**9.2.11.1** calculate Areas of different shapes: *Triangle, Rectangle, Square, Parallelogram, Rhombus and Trapezium*	**4.** find the perimeter of the given shapes. **(a)** 
AREAS OF CIRCLES AND SECTORS **9.2.12** understand how area and sectors of circles are determined ***(u)***	**9.2.12.1** identify area of circle **9.2.12.2** calculate the area of given circles and sectors given the diameter and radius	
COMPOSITE SHAPES **9.2.13** recognise Compound Shapes and those shapes that made compound shapes ***(s)***	**9.2.13.1** identify compound shape and different shapes that made up the compound shapes	
9.2.14 know how to calculate the area of various compound shapes ***(k)***	**9.2.14.1** calculate the area of different composite shapes using appropriate formulae	**(b)** 
TOTAL SURFACE AREAS OF PRISM **9.2.15** recognise the surface area of prisms for 3 – dimensional shapes ***(s)***	**9.2.15.1** define surface area of prisms **9.2.15.2** define the term Prism	
9.2.16 know how to calculate the surface areas of prisms ***(k)***	**9.2.16.1** calculate the total surface area of given Prisms by adding the areas of each surface of the shape.	**5.** calculate the volume of the following shapes. **(a)** 
SURFACE AREA OF PYRAMIDS **9.2.17** know how to calculate the surface area of a Pyramid ***(k)***	**9.2.17.1** identify Pyramid shapes **9.2.17.2** calculate the surface area of various pyramids	

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.2 MEASUREMENT (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
CYLINDERS,CONES AND SPHERES **9.2.18** know how to use formula to calculate the surface areas of cylinders, cones and spheres ***(k)***	**9.2.18.1** identify different types of shapes such as cylinder, cones, spheres **9.2.18.2** calculate the areas of cylinder, cones and spheres using the formula **9.2.18.3** solve word problems on practical situation related to areas of cylinder, cones and spheres using formulae	**(b)**  Area of the end = 20 cm^2
VOLUME **9.2.19** understand that the amount of space inside a prism can be determined ***(u)***	**9.2.19.1** define Volume **9.2.19.2** identify the units that are used for volume: mm^3, cm^3 and m^3	
9.2.20 know how to calculate the volume of various prisms with their cross sections given ***(k)***	**9.2.20.1** calculate volumes of prisms **9.2.20.2** calculate volumes of solids given the area of the base (cross sections)	**6.** find the total surface area and volume of the following spheres. **(a)** 
VOLUMES OF PYRAMIDS AND CONES **9.2.21** know how to use the formula to calculate the volume of Pyramids and Cones ***(k)***	**9.2.21.1** identify the formula e that are used to calculate the volume of pyramid and cones **9.2.21.2** calculate the volume of pyramid and cones using the formula	
VOLUME OF SPHERE **9.2.22** know how to use the formula to calculate the volume of sphere ***(k)***	**9.2.22.1** identify the formula that is used to calculate the volume of Sphere **9.2.22.2** calculate the volume of Sphere	
CAPACITY **9.2.23** understand capacity and how it is defined compared to volumes ***(u)***	**9.2.23.1** define Capacity **9.2.23.2** identify appropriate units that are used for capacity. **9.2.23.3** convert units of capacity from one to another, Example: L to cm^2, ml to L, ml to cm^2	**(b)** 
9.2.24 know how to calculate the capacity of various objects, shapes and items ***(k)***	**9.2.24.1** calculate capacity of various objects, shapes and items that are commonly found in our homes. Example: pot, esky, buckets, drums	

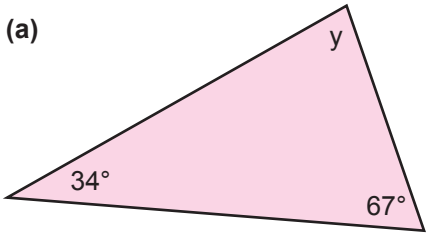
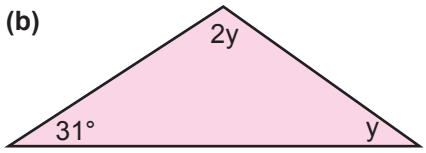
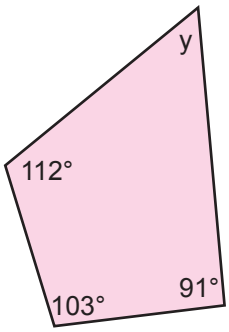
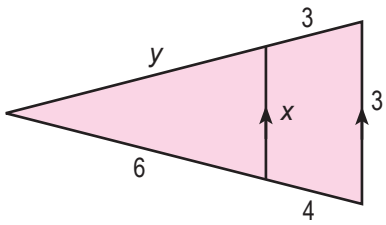
Subject: MATHEMATICS **Year: 9**

Strand: GEOMETRY

Sub-strand: 9.3 GEOMETRY (10 periods)
Geometry is part of maths that deals with size, shape, relative position of figures, and the properties of space. It originated as a *practical* science, concerned with surveying, measurements, areas, and volumes. Initially, it was a body of practical knowledge concerning lengths, areas and volume, was improved by Euclid, who set a standard that is used today and for many centuries to follow. Geometry is used extensively in the field of astrology, especially mapping the positions of the stars and planets on the celestial sphere. Among the notable accomplishments of geometry is the formulation of formulas for lengths, areas and volumes, such as Pythagorean theorem, circumference and area of a circle, area of a triangle, volume of a cylinder, sphere and a pyramid.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
ANGLE REVIEW **9.3.1** know how angles are formed with straight lines ***(k)***	**9.3.1.1** define angle	**1.** classify the following angles. **(a)** 116° **(b)** 11° **(c)** 127° **(d)** 43° **(e)** 236° **(f)** 316°
9.3.2 know that angles are classified or named according their sizes ***(k)***	**9.3.2.1** name and classify angles according to their sizes	
9.3.3 recognise Complementary and Supplementary angles and how they are formed ***(s)***	**9.3.3.1** define Complementary and Supplementary angles **9.3.3.2** find angles that are complementary and supplementary to other angles	**2.** state the complement and supplement of each of the following angles. **(a)** 15° **(b)** 27° **(c)** 39° **(d)** 49° **(e)** 51° **(f)** 62°
9.3.4 recognise angles that are formed in a straight line and in a circle ***(s)***	**9.3.4.1** identify angles that are formed in a straight line and in a circle **9.3.4.2** find other (missing) angles using properties of straight line angles and angles in a circle	**3.** find the values of the pronumerals in each of the following. **(a)** 
9.3.5 recognise different angles that are formed when transversal line cuts through a pair of parallel lines ***(k)***	**9.3.5.1** identify Transversal and Parallel lines **9.3.5.2** name and identify angles that are formed when a Transversal Line cuts through a pair of Parallel Lines **9.3.5.3** calculate missing angles using the properties of Corresponding, Alternate and Co-interior angles	**(b)** 
9.3.6 recognise Vertically Opposite and Adjacent angles and how they are formed (s)	**9.3.6.1** define and identify Vertically Opposite and Adjacent angles **9.3.6.2** find missing angles using their properties	
POLYGON FACTS **9.3.7** recognise and differentiate angle sum of a Triangles, Quadrilaterals and any other Polygon Shapes ***(s)***	**9.3.7.1** define Polygons **9.3.7.2** identify Angle –Sum in a Triangle, Quadrilaterals and Polygon shapes and they are calculated	

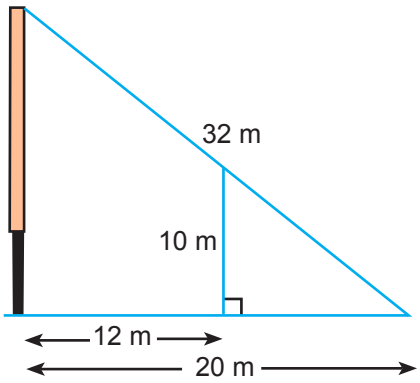
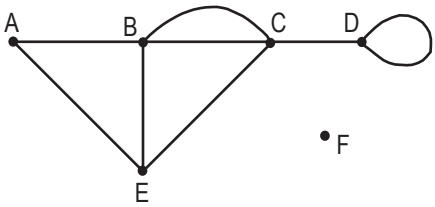
Subject: MATHEMATICS	Year: 9
Strand: GEOMETRY	
Sub-strand: 9.3 GEOMETRY (10 periods)	

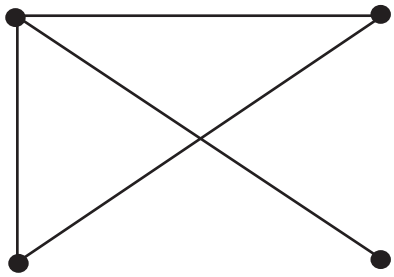
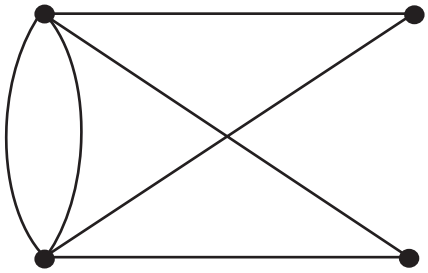
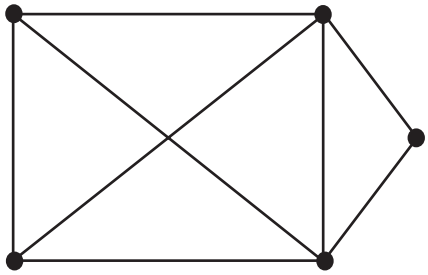
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.3.8 know how to find the angle sum of any given polygons ***(k)***	**9.3.8.1** calculate interior angle – Sum for triangles using Triangle and formula: ***Angle sum = (n – 2) x 180⁰***	**4.** find the value of the pronumeral in each of the following. **(a)** 
CONGRUENT SHAPES **9.3.9** understand that two shapes are congruent if they are identical in terms of size and shape ***(u)***	**9.3.9.1** define and identify Congruent shapes **9.3.9.2** identify the RULES that can be used to identify congruent triangles - *Side – Side – Side (SSS)* - *Side – Angle – Side (SAS)* - *Angle – Side – Angle (ASA)*	
9.3.10 know how to Prove that shapes are congruent and also find values for pronumerals ***(k)***	**9.3.10.1** prove and identify Triangles that are congruent using the above Rules **9.3.10.2** find the missing values that are represented by pronumerals for congruent shapes	**(b)** 
SIMILAR SHAPES **9.3.11** understand that shapes are similar even if they have different shapes and sizes ***(u)***	**9.3.11.1** define and identify shapes that are similar	**(c)** 
9.3.12 know how to enlarge and reduce shapes from its original shape ***(k)***	**9.3.12.1** increase and reduce figures and objects using ratios through scale factors **9.3.12.2** identify scales factors of shapes and objects that have been enlarged	
EXPLORING SIMILAR TRIANGLES **9.3.13** understand that triangles can be similar even if they have different sizes ***(u)***	**9.3.13.1** measure the length of the sides of given shapes to identify shapes that are similar	**5.** find the value of *x* and *y*. 
SIMILAR TRIANGLES **9.3.14** know how to use triangle to identify how shapes are similar ***(k)***	**9.3.14.1** identify the RULES that can be used to TEST whether triangles are similar or not. - *SSS: Side – Side – Side* - *SAS: Side – Angle – Side* - *AAA: Angle – Angle – Angle* - *RHS: Right angle – Hypotenuse – Side*	

Subject: MATHEMATICS **Year: 9**

Strand: GEOMETRY

Sub-strand: 9.3 GEOMETRY (10 periods)

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.3.15 know how use the given tests to compute similar shapes, and missing angles ***(k)***	**9.3.15.1** identify pairs of triangles that are similar using the above Rules **9.3.15.2** prove why given triangles are Similar **9.3.15.3** find the value of pronumerals that are given in similar triangles	**6.** the scoreboard at the local footy ground needs a support to keep it in place. The support is 32 m long and it is positioned 20 m from the base of the scoreboard. There is a 10 m long prop for this support 12 m from the scoreboard. What is the height of the scoreboard? 
APPLYING SIMILAR TRIANGLES **9.3.16** understand the practical application of similar triangles in real life situations ***(u)***	**9.3.16.1** calculate and solve practical questions using the concept of similar triangles	
EXPLORING 3D SHAPES **9.3.17** know how to identify and draw 3– Dimensional shape on to a 2– Dimensional surface ***(k)***	**9.3.17.1** define Prisms and Plutonic solids **9.3.17.2** name Plutonic solids that are made of regular polygon shapes	
9.3.18 know how to calculate the total surface area and volumes of different Platonic solids ***(k)***	**9.3.18.1** find the total surface area and volumes of given Plutonic Shapes **9.3.18.2** enlarge shapes with given scale factor **9.3.18.3** create Nets for given Plutonic solids	**7.** copy and complete the table for the graph below. Vertex: A, B, C, D, E, F Degree:
UNDIRECTED GRAPHS AND NETWORKS **9.3.19** understand that not all graphs have axes and coordinates, some graphs are not ***(u)***	**9.3.19.1** identify and define Undirected Graphs or Networks **9.3.19.2** identify the main purpose of using Undirected Graphs and its advantages	
9.3.20 understand that a Undirected Graph is made up of many different parts that creates a Graph or Network ***(u)***	**9.3.20.1** name the main components (parts) of a Undirected Graph **9.3.20.2** define the following terms: *Vertices (node), Edges, Loops and Degree of a Vertex* **9.3.20.3** name other graphs that also make up a network **9.3.20.4** define the following terms: *Subgraph, Simple Graph, Isolated Vertex, Degenerated Graph, Connect Graph and Complete Graphs* **9.3.20.5** name other parts of a Simple Graph	

Subject: MATHEMATICS	Year: 9	
Strand: GEOMETRY		
Sub-strand: 9.3 GEOMETRY (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
PLANAR GRAPHS AND EULER'S FORMULA **9.3.21** recognise the Planar Graph and its features ***(s)***	**9.3.21.1** define Planar graph and identify its properties and features	**8.** redraw the following as planar graphs and confirm Euler's formula.
9.3.22 understand how a Planar graph divides a Plan into regions, it covers inside and outside of the graph ***(u)***	**9.3.22.1** identify different regions of a planar graph **9.3.22.2** determine the number of degrees in a Planar graph **9.3.22.3** draw a planar graph given vertices and edges	**(a)** 
9.3.23 know how to convert a 3 – Dimensional solid (with flat faces) into a planar graph ***(k)***	**9.3.23.1** draw a 2 Dimensional planar graph by converting 3D shapes	
9.3.24 recognise the Euler's formula and know how to apply it into real situation ***(s)***	**9.3.24.1** identify variables in the Euler's formula **9.3.24.2** Verify Euler's formula using 3D shapes and planar graph	**(b)**  **(c)** 

Subject: MATHEMATICS **Year: 9**

Strand: ALGEBRA

Sub-strand: 9.4 ALGEBRA SKILLS (15 periods)
Manipulating expressions and equations is one of the major skills that is provided by Algebra. The process and the steps that are taken to do the manipulations have rules and conventions that must be followed. Recognising the language of algebra is vital in how the terms, expressions, equations and brackets are manipulated to an effect of having results either, terms, expressions or value when the expression or equation is being evaluated. Brackets are also expanded using distributive law and difference of two squares and perfect squares for pairs of brackets.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
VARIABLES AND EXPRESSIONS **9.4.1** understand the language of algebra ***(u)***	**9.4.1.1** define algebra **9.4.1.2** identify and define terms and words that are used in algebra	**1.** simplify. **(a)** 4r + 5r **(b)** 5t + 13t **(c)** 6a + 18a **(d)** 14m + 5m + 3m **(e)** 15y + 13y + y **(f)** 8m + 3b + 7m
9.4.2 know how to how to write and express simple word sentences into algebra language ***(k)***	**9.4.2.1** identify the algebraic terms such as Pronumeral, Variable, term, expression, coefficient, constant and equation	**2.** expand and simplify the following expressions. **(a)** 2(x + 4) **(b)** 3(b − 2) **(c)** 3(k − 5) **(d)** –5(m + 2) **(e)** –2(m + 3) **(f)**–2(b − 4)
RECOGNISE LIKE TERMS **9.4.3** recognise Like terms and Unlike terms ***(s)***	**9.4.3.1** identify and differentiate between Like and Unlike terms	
9.4.4 know how to group and simplify expressions with different terms ***(k)***	**9.4.4.1** simplify expressions with different terms by grouping like terms.	**3.** expand and simplify the following expressions. **(a)** 2(r + 7) + 13(r + 5) **(b)** 5(x + 3) + 2(x + 1) **(c)** 9(q + 6) − 3(q + 10) **(d)** 3(r − 5) + 3(r + 7)
EXPANDING BRACKETS **9.4.5** know how to expand brackets that in an expressions and equations ***(k)***	**9.4.5.1** expand brackets using **Distributive Law** **9.4.5.2** expand brackets that are in an expression and equation using distributive law and simplify them by collecting like terms	**4.** expand and simplify the following expressions. **(a)** (q + 5)(q + 7) **(b)** (g + 1)(g + 9) **(c)** (m + 3)(m − 8) **(d)** (w + 2)(w − 4) **(e)** (t − 10)(t + 2) **(f)** (y − 8)(y − 2)
EXPANDING BRACKETS – Difference of Two Squares and Perfect Squares **9.4.6** understand how Difference of two squares and Perfect squares can be used to expand brackets ***(u)***	**9.4.6.1** define and differentiate Difference of Two Squares and Perfect Squares	
9.4.7 know how to how to expand and simplify pairs of brackets using Difference of two squares and Perfect squares ***(k)***	**9.4.7.1** expand and simplify pairs of brackets with a negative and positive signs using Difference of Two Squares and Perfect Squares.	**5.** expand and simplify the following expressions by using the difference of two squares identity. **(a)** (d + 12)(d − 12) **(b)** (f + 13)(f − 13) **(c)** (m − 15)(m + 15) **(d)** (2c + 3)(2c − 3) **(e)** (6g − 9)(6g + 9)
FACTORISATION – Highest Common Factor **9.4.8** understand that factorisation is the opposite of expanding brackets ***(u)***	**9.4.8.1** define factorisation **9.4.8.2** identify Highest Common Factor	

Subject: MATHEMATICS	Year: 9
Strand: ALGEBRA	
Sub-strand: 9.4 ALGEBRA SKILLS	(15 periods)

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.4.9 know how to factorise expressions by identifying the Highest Common Factor and grouping the same terms ***(k)***	**9.4.9.1** factorise expressions by taking the Highest Common Factor **9.4.9.2** factorise expressions by grouping those terms that are the same	**6.** expand and simplify the following expressions by using the perfect squares identity. **(a)** $(d - 3)^2$ **(b)** $(2 + h)^2$ **(c)** $(7h - 3)^2$ **(d)** $(5 + 2w)^2$ **(e)** $(4r - 2)^2$ **(f)** $(3 + 7t)^2$
FACTORISATION – Difference of Two Squares **9.4.10** recognise Difference of two squares and use its properties to factorise expressions ***(s)***	**9.4.10.1** factorise expressions using Difference of two squares	**7.** the formula for finding the velocity, v, of an object after accelerating over a distance d is $v^2 = u^2 + 2ad$. **(a)** rearrange the formula to make a the subject. **(b)** find a when v = 5, u = 1 and d = 2.
FACTORISATION – The perfect square identity **9.4.11** recognise Perfect squares and use its properties to factorise expressions ***(s)***	**9.4.11.1** factorise expressions using Perfect squares	
SUBSTITUTE FOR VARIABLES IN FORMULAE AND EXPRESSIONS **9.4.12** know how to replace variables in an expressions and Formula ***(k)***	**9.4.12.1** substitute variables in an expression and formulae **9.4.12.2** evaluate expressions and formulae by replacing variables with values	**8.** rearrange the formula in each of the following to make the variable in brackets the subject of the formula (Assume all variables are positive). **(a)** $V = \pi r^2 h$ (r) **(b)** $E = \frac{1}{2} m v^2$ (v) **(c)** $F = \frac{dh^2}{k}$ (h) **(d)** $k = 7\sqrt{\frac{m}{n}}$ (m)
PYTHAGORAS THEOREM **9.4.13** understand Pythagoras Theorem and how it is used to find the three sides to a Right Angle Triangle ***(u)***	**9.3.13.1** define the Pythagoras Theorem **9.3.13.2** find the Hypotenuse side using the Pythagoras Theorem **9.3.13.3** find the other two shorter sides using the Pythagoras Theorem	
RE-ARRANGE FORMULAS **9.4.14** know how to re-arrange formulas and equations to make one quantity become the subject ***(k)***	**9.4.14.1** re-arrange formulae and equations to make one quantity the subject	
9.4.15 know how to evaluate formulae and equations by substituting variables by given values ***(k)***	**9.4.15.1** evaluate formulae and equations by replacing unknown numbers in the equation and formulae	
USING ALGEBRA TO SOLVE WORD PROBLEMS **9.4.16** know how to convert mathematical statements in words to algebra statements ***(k)***	**9.4.16.1** convert mathematical statements in words to algebraic statements in symbols	
9.4.17 know how to use the logical steps to solve word problems algebraically ***(k)***	**9.4.17.1** solve word problems algebraically by using logical steps provided	

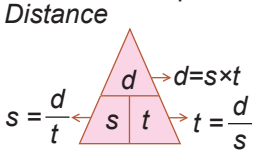
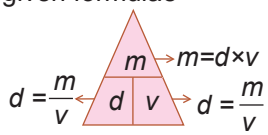
Subject: MATHEMATICS **Year: 9**

Strand: NUMBERS

Sub-strand: 9.5 RATIOS AND RATES (15 periods)
Ratio is the relationships between two amounts A and B and can be represented by pair of numbers indicating how much bigger one amount is than the other. The ratio of quantities A and B can be expressed as: 'the ratio of A to B, or B is to A, or A:B or as a fraction.' Rate is the measure of the way in which one quantity changes with respect to another. Rates are stated using units in fraction form.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
FRACTIONS, RATIOS AND SIMPLIFYING **9.5.1** understand that two or more quantities can be compared by looking at the relationships between them ***(u)***	**9.5.1.1** define ratio **9.5.1.2** identify the Symbol that is used for Ratio **– " : "** **9.5.1.3** express quantities as ratio using the " IS TO" symbol – **' : '** and or as fractions	**1.** simplify these ratios: **(a)** 20:25 **(b)** 15:65 **(c)** 24:42 **(d)** 12:15 **(e)** 81:27 **(f)** 120:15 **(g)** 24:18
9.5.2 know how to expressed quantities as ratios in the simplest form ***(k)***	**9.5.2.1** express quantities as ratio in the simplest form	**2.** express the following as the simplest ratios. Remember to convert units first. **(a)** 120 cm:1 m **(b)** 28 mm:10 cm **(c)** 132 m:11 cm **(d)** 380 m:2.5 km **(e)** 4 kg:250 g
USING RATIOS TO FIND QUANTITIES **9.5.3** know how to use ratio to find other quantities and missing numbers ***(k)***	**9.5.3.1** find the missing numbers or quantities using given ratios	**3.** simplify these ratios. **(a)** 28:32 **(b)** 35:65 **(c)** 24:36 **(d)** 18:15
9.5.4 know how to share quantities using ratio ***(k)***	**9.5.4.1** share quantities using given ratios **9.5.4.2** solve practical word problems	**4.** express the following as simplest ratios. **(a)** 5 cm:1.2 m **(b)** 360s:4 min **(c)** 3 kg:200 g **(d)** 21 days:2 weeks
CHANGING QUANTITIES IN A GIVEN RATIO **9.5.5** understand that quantities can be either increased of decreased by multiplying ratios with a number that is either greater than or less than one (1) ***(u)***	**9.5.5.1** increase or Decrease quantities by multiplying them with given ratios expressed as fractions	**5.** find the value of x to make the ratios the same, using algebra. **(a)** x:24 = 6:36 **(b)** 18:x = 3:27 **(c)** 30:25 = x:15 **(d)** 36:16 = 8:x
RATES OF CHANGE **9.5.6** understand Rate and how it is measured and determined ***(u)***	**9.5.6.1** define Rate **9.5.6.2** express Rates of various quantities in fraction form then simplify them **9.5.6.3** calculate quantities per unit	**6.** the ratio of shirts to jeans in a clothes shop is 7:3. If there are 133 shirts, find: **(a)** the number of jeans **(b)** the total number of shirts and jeans in the shop
9.5.7 know how to use various Rates of quantities to find other quantities ***(k)***	**9.5.7.1** find other quantities using known rates of quantities	
RATES AND UNITS **9.5.8** know how to express rates in different units ***(k)***	**9.5.8.1** covert units of various Rates from one unit to another	

Subject: MATHEMATICS	Year: 9
Strand: NUMBERS	
Sub-strand: 9.5 RATIOS AND RATES (15 periods)	

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
USING RATES: DISTANCE, TIME, SPEED **9.5.9** understand how to calculate various Rates of Distance, Time and Speed ***(u)***	**9.5.9.1** identify different formulas that can be used to find the Rates of: *Speed, Time* and *Distance*  ***S*** *= Speed,* ***T*** *= Time,* ***D*** *= Distance* **9.5.9.2** identify appropriate Speed units that would be best use for different speed **9.5.9.3** calculate Various Speed, Time and Distance on given practical questions	**7.** a cordial drink is made by mixing syrup with water in the ratio 3:25. If 268•8 litres of cordial is made, find the amount of syrup and water used. **8.** increase the following in the ratio of 5:4: **(a)** 30 metres **(b)** 120 centimetres **(c)** 46 grams **(d)** 18 kilograms **(e)** $130 **(f)** 92 minutes **9.** decrease the following in the ratio 1:5. **(a)** 120 grams **(b)** 895 millimetres **(c)** $45.10 **(d)** 768.5 kilograms **(e)** 45 hours **(f)** 10.5 hours
DENSITY **9.5.10** understand that the Density of a material is the Ratio of its Mass to a Standard Volume ***(u)***	**9.5.10.1** define Density **9.5.10.2** calculate the Density, Mass and Volume of various objects and materials using the given formulae  ***M*** *= Mass,* ***D*** *= Density,* ***V*** *= Volume*	**10.** express each of the following situations using a rate in simplest form. **(a)** 25 litres of petrol was used in travelling 280 km. **(b)** The car travelled 52 kilometres in three-quarters of an hour. **(c)** The oven heated up from 10°C to 260°C in 5 minutes. **(d)** A bowler bowled 69 overs to take 6 wickets.
EXPLORING TIME – DISTANCE GRAPHS **9.5.11** understand how graphs can be visually used to represent information ***(u)*** **9.5.12** know how to construct various graphs ***(k)***	**9.5.11.1** name and Label different parts of a Time/ Distance graph **9.5.12.1** write scales on the axes with numbers against the lines **9.5.12.2** construct various time / distance graphs and use them to calculate speed, distance and time for given graphs	**11.** if 56.4 metres of fencing wire costs $183.30, find the cost per metre of the wire. At this rate find the cost of these lengths of wire: **(a)** 46 metres **(b)** 144 metres **(c)** 89.7 metres **12.** an advertisement containing 38 words costs $68.40. Find the cost per word and then find the cost of an advertisement with the following number of words. **(a)** 30 **(b)** 42 **(c)** 84 **(d)** 546

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.5 RATIOS AND RATES (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.5.13 know how to calculate speed using the slope that represent speed on the graph ***(k)***	**9.5.13.1** identify the gradient (slope) of the graph **9.5.13.2** identify the parts of the Gradient Gradient which is $\frac{\text{Rise}}{\text{Run}}$ **9.5.13.3** calculate Speed using the Gradient (slope) that is indicated by the graph using – Gradient	
RATES AND GRAPHS **9.5.14** understand how to calculate rates at which quantities changes, either increase or decrease can be calculated using Gradient (slope) of the line graph ***(u)***	**9.5.14.1** calculate the rates of speed, time and distances and the time, speed and distance using line graphs	
EXPLORING RATES OF CHANGE GRAPHS **9.5.15** understand how rate of change can be determined by using the Tangent Line to get the gradient : Rise divide by Run to get the changing rate for given quantities ***(u)***	**9.5.15.1** draw Tangent Lines to given points on the curve lines to determine the rate of change for given quantities **9.5.15.2** define *Average Rate of Change* **9.5.15.3** define *Instantaneous* **9.5.15.4** calculate Rates of Change for given quantities	

Subject: MATHEMATICS **Year: 9**

Strand: NUMBERS

Sub-strand: 9.6 CONSUMER MATHS (15 periods)
Consumer is a broad label for any individual or household that use goods and services generated within the economy. The concept of a consumer is used in different context however, consumer maths in mathematics refers to how maths can be used by consumers in their effort to get or buy the best goods and services offered. Percentage is used extensively by consumers to assist them to make decisions by making comparison between prices of goods and services that consumers are willing to pay for.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
CALCULATION IN BUSINESS **9.6.1** know how to calculate transactions that have been done in businesses ***(k)***	**9.6.1.1** calculate costs, sales and other business transactions with money	1. find the following. **(a)** 8% of $350 **(b)** 2% of $500 **(c)** 7% of $200 **(d)** 1% of $1000 **(e)** 5% of $4500
EXPLORING COSTS IN BUSINESS **9.6.2** know how to compare costs in business offering the same service ***(k)***	**9.6.2.1** calculate and compare costs of goods and services to determine the best buy: Cheaper goods and services with high qualities	**2.** find the percentage increase when 60 changes to. **(a)** 90 **(b)** 105 **(c)** 75 **(d)** 80
EXPLORING COSTS OF HAVING A HOLIDAY IN THE SOLOMON ISLANDS **9.6.3** know how to calculate costs that would be incurred if taking a holiday in the country ***(k)***	**9.6.3.1** calculate the costs involve in a family taking a holiday down to the Western Province, Solomon Islands **9.6.3.2** compare costs that involves in taking a holidays in the Solomon Islands	**3.** convert these decimals to percentages. **(a)** 0.5 **(b)** 2.5 **(c)** 0.1 **(d)** 0.05 **(e)** 0.444 **(f)**2.1919 **(g)** 5.66 **(h)** 0.97 **(i)** 0.003 **(j)** 0.7 **(k)** 2.1 **(l)** 2.405
EXPLORING PERCENTAGE **9.6.4** know how to use grid, pie charts and other objects to represent percentages ***(k)***	**9.6.4.1** define the term Percent and identify the symbol that is used for percent – " % " **9.6.4.2** find the percentage of shaded diagrams using grid, pie charts and other objects	**4.** convert these fractions to percentages. **(a)** 7 ½ **(b)** 5 ¼ **(c)** 2 ¾ **(d)** $4\ ^4/_5$ **(e)** $^3/_8$ **(f)** $^5/_6$ **(g)** $^1/_3$ **(h)** $^1/_{12}$
CONVERTING PERCENTAGES **9.6.5** know how to convert fractions and decimals to a percentages and vice versa ***(k)***	**9.6.5.1** convert decimals and fractions to percentages **9.6.5.2** convert percentages to decimals and fractions	**5.** find the following. **(a)** 10% of $350 **(b)** 2% of $600 **(c)** 6% of $300 **(d)** 1% of $10 000 **(e)** 5% of $1500 **(f)** 5% of $12 **(g)** 5 % of $200 **(h)** % of $5000 **(i)** % of $850
FINDING PERCENTAGE OF QUANTITIES **9.6.6** understand how percentage of quantities are calculated ***(u)***	**9.6.6.1** define the term Interest **9.6.6.2** find the interest charged or receive at a given rate at a given time the money and items are lent or borrowed	**6.** the following students gained these marks on a Year 9 test. If the test was out of 60 marks, calculate each student's percentage. **(a)** Mary-Jane 42 marks **(b)** Cameron 33 marks **(c)** Adrian 45 marks **(d)** Fergus 55 marks **(e)** Janelle 58 marks **(f)** Susie 28 marks
EXPRESSING QUANTITY AS A PERCENTAGE **9.6.7** know how to express one quantity as percent of another quantity ***(k)***	**9.6.7.1** evaluate expressions by substituting in values	

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.6 CONSUMER MATHS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.6.8 know how to find the original amount given the percentage of a quantity ***(k)***	**9.6.8.1** calculate the original amount using the given percentage of quantities	**7.** if Emerson gained 78% on a test out of 90 marks, how many marks did he gain?(Give your answer to the nearest whole number)
PERCENTAGE CHANGE **9.6.9** understand that percentage can be used to indicate changes regarding the original amounts or quantities ***(u)***	**9.6.9.1** define the term Discount **9.6.9.2** calculate Percentage Increase or Decrease on items ***Percentage Increase***: Percentage Increase = $\frac{Increase}{Original} \times \frac{100\%}{1}$ ***Percentage Decrease***: Percentage Decrease = $\frac{Decrease}{Original} \times \frac{100\%}{1}$	**8.** find the first as a percentage of the second: **(a)** 8 of 40 **(b)** 1 of 50 **(c)** 15 of 500 **(d)** 1.2 of 6.4 **9.** Samani gained 43 marks on his test, which gave him 64%. How many marks were on the test?
	9.6.9.3 calculate Discounts on items	**10.** find 100% if: **(a)** 5% is 20 **(b)** 10% is 15 **(c)** 75% is 64 **(d)** 12.5% is 5
PROFIT AND LOSS **9.6.10** understand that the two results of running a business is to make a Profit or Loss ***(k)***	**9.6.10.1** define the following terms: *Profit, Loss, Income* and *Expenditure* **9.6.10.2** calculate Profit and Loss on items	**11.** calculate the commission that is paid in each of these situations. **(a)** 2% on $23 500 **(b)** 1% on $570 000 **(c)** 10% on $12 400 **(d)** 25% on $224 **(e)** 5% on $650 **(f)** 12% on $1000
9.6.11 know how to express profit and loss as percentages on items ***(k)***	**9.6.11.1** calculate percentage profit and loss on items ***Percentage Profit*** = $\frac{Profit\ made}{Original\ cost} \times \frac{100\%}{1}$ ***Percentage Loss*** = $\frac{Loss\ made}{Original\ cost} \times \frac{100\%}{1}$	**12**. Henry works at a department store for 10 hours every week and earns $12.80 per hour. **(a)** calculate Henry's weekly income. **(b)** calculate Henry's annual income. **(c)** how much tax does Hayley pay for the year? **(d)** how much tax would be taken out of her wage each week? **(e)** how much money does Hayley have to spend each week?
COMMISSION **9.6.12** understand Commission and how it used in businesses ***(k)***	**9.6.12.1** define commission	
9.6.13 know how to calculate commissions on sales and items in a business ***(k)***	**9.6.13.1** calculate commission on sales and total earnings	**13.** find the simple interest on a loan of $5000 at 2% per annum for 5 years. **14.** calculate the simple interest on a principal of $12 800 at 5% per annum for 10 years.

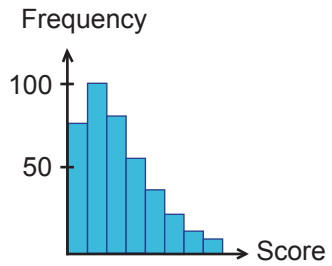
Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.6 CONSUMER MATHS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
WAGES AND TAX SCALES **9.6.14** understand that "Tax" must be deducted by the government from every single person who earns money in the country ***(u)***	**9.6.14.1** define Tax **9.6.14.2** calculate how much tax is to be deducted from people who earn income	
SIMPLE INTEREST **9.6.15** understand what is Simple Interest and how it is applied in businesses ***(u)***	**9.6.15.1** define Simple Interest **9.6.15.2** identify formula that is used to calculate Simple Interest: $SI = Principal \times \frac{Rate}{100} \times Time$ ***OR*** $SI = \frac{PRT}{100}$ **9.6.15.3** define the terms that are used in the formula: *Principal, Rate* and *Time*	
9.6.16 know how to calculate Interests on investments and Loans ***(k)***	**9.6.16.1** calculate the simple interest on investments and loans using the formula: $SI = \frac{PRT}{100}$	

Subject: MATHEMATICS **Year: 9**

Strand: PROBABILITY AND STATISTICS

Sub-strand: 9.7 STATISTICS (15 periods)
Statistics in maths is the science pertaining to the collection, analysis, interpretation or explanation, and presentation of data. It also deals with the planning of the collection of data, in terms of the design of surveys and experiments. Statistics also provides tools for prediction and forecasting using data and statistical models which sometimes refer to as descriptive statistics. Statistics is applicable to a wide variety of academic, including natural and social science, government, and business where distinctive graphs can be used to represent data.

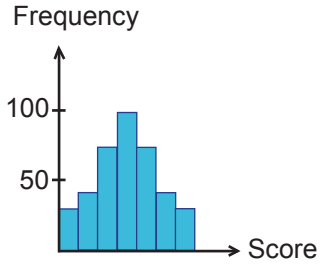
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
HISTOGRAMS **9.7.1** understand that numerical data are datathat involve counting or measurement; which either Discrete or Continuous ***(u)***	**9.7.1.1** define Numerical Data **9.7.1.2** name two types of Numerical Data: - *Discrete* - *Continuous* **9.7.1.3** define and differentiate Discrete and Continuous data	**1.** collect the heights of your class mates and **(a)** put the data into a Frequency Table **(b)** display the data in a histogram
9.7.3 know how to construct Histogram Graphsand use it to display Numerical Data ***(k)***	**9.7.3.1** define Histogram graph **9.7.3.2** identify the features and properties of Histograms **9.7.3.3** construct Histogram Graphs to display Continuous Numerical Data	**2.** the number of children per family in a group of families is displayed in a frequency table below. Find the mean number of children per family in the group.
9.7.4 know how to analyse and compare datain various classes in a set of data ***(k)***	**9.7.4.1** calculate the *Relative Frequency* and *Percentage Frequency* for given data -Relative Frequency $= \frac{\text{Frequency}}{\text{Total Frequency}}$ -RelativeFrequency = $\frac{\text{Frequency}}{\text{Total Frequency}} \times 100$	No. of children / Frequency 1 / 4 2 / 10 3 / 6 4 / 3 5 / 2 Total / 25
9.7.5 understand how to describe a graph by considering the shape, the centre and the spread of the data ***(u)***	**9.7.4.2** compare Frequencies of data in given classes using percentages **9.7.4.3** use the Histogram Graph to identify the Modal Class Interval for a set of scores **9.7.5.1** describe the Shape of the Histogram: *either Positive or Negative Skewed.* Histograms that tail off are described as **skewed**	
DOUBLE COLUMN BAR GRAPHS **9.7.6** understand that column graphs can be used to display two sets or more data either separately or double ***(u)***	**9.7.6.1** identify a Double Column Graph and its features **9.7.6.2** display data as a Double ColumnBar Graph	

Subject: MATHEMATICS Year: 9		
Strand: PROBABILITY AND STATISTICS		
Sub-strand: 9.7 STATISTICS (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.7.7 know how to construct a Double Column Bar Graph and display given data ***(k)***	**9.7.7.1** construct Double Column Bar Graphs and display given data **9.7.7.2** read information from double column graphs and analyse them	**3.** in a game of chance, two dice are toss. If the total of the two numbers shown on the dice is 9 or more, the player wins that number in dollars. If the total of the two numbers is 8 or less, the player loses that number in dollars. One player tosses the dice 36 times and obtained these scores: 10, 8, 9, 5, 6, 11, 7, 8, 5, 7, 2, 6, 4, 4, 3, 9, 3, 12, 5, 5, 8, 9, 6, 7, 4, 7, 10, 6, 11, 8, 7, 10, 6, 9, 7, 8
THE MEAN AND THE RANGE **9.7.8** understand what Mean is and how it is determined for a set of scores ***(u)***	**9.7.8.1** define mean **9.7.8.2** identify the symbol that is used for Mean $\bar{x}$	
9.7.9 know how find the total sum of a set of scores in a Frequency Table ***(k)***	**9.7.9.1** find the Total Sum of a set of scores in a Frequency Table by multiplying columns 'x' and 'f' then ADD them together	
9.7.10 know how to calculate the Mean of Single and Group set of Scores ***(k)***	**9.7.10.1** calculate the Mean of a set of scores for single data using the given formula $\bar{x} = \frac{\sum x}{n}$ **9.7.10.2** find the Middle Number for each Classes of scores for given Group Data **9.7.10.3** calculate the Mean of a set of scores for Group Data using the given formula $\bar{x} = \frac{\sum xf}{\sum f}$	**a.** construct a frequency table to represent the data **b.** add in a column to represent the amount won or lost. **c.** calculate the mean amount won or lost in this game. **d.** obtain two dice and toss them 36 times. Did you win or lose on the game? **e.** use a grid to calculate the theoretical probability of obtaining each score
9.7.11 know how to find and determine the Range of a set of scores ***(k)***	**9.7.11.1** define Range of a set of scores **9.7.11.2** calculate the Range for scores of Single and Group Data	**4.** draw cumulative percentage frequency curves to represent the following histograms: **(a)** 
9.7.12 know how to Tabulate data using Frequency Tables ***(k)***	**9.7.12.1** construct a frequency table to represent the given data	
CUMULATIVE FREQUENCY **9.7.13** understand how to get values for the cumulative frequency column ***(u)***	**9.7.13.1** define Cumulative Frequency **9.7.13.2** get values for the Frequency Column	
9.7.14 know how to express Cumulative Frequency as Percentages ***(k)***	**9.7.14.1** change cumulative frequency scores to percentages to have Cumulative Percentage Frequency values	

Subject: MATHEMATICS **Year: 9**

Strand: PROBABILITY AND STATISTICS

Sub-strand: 9.7 STATISTICS (15 periods)

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.7.15 know how to graph Cumulative Percentage Frequency to give curve or "Ogive" ***(k)***	**9.7.15.1** graph Cumulative Percentage Frequency to give Ogive or curve	**(b)** 
9.7.16 know that data can be represented by using Percentiles: Common ones are; Q1, Q2, & Q3 ***(k)***	**9.7.16.1** display cumulative frequency and the cumulative percentage frequency on a graph as a Curve or Ogive	
9.7.17 know how to construct and estimate Percentiles and Quartiles using the Curve or Ogive ***(k)***	**9.7.17.1** identify the three main percentiles for given data - *Upper Quartile, Q3, 75%, ¾* - *Median, Q2, 50%, ½* - *Lower Quartile, Q1, 25%, ¼*	**5.** find the mean for the weight of meat in 25 quarter-pound burgers. Their weights, in grams, were: 109, 113, 118, 123, 126, 122, 124, 127, 107, 105, 114, 112, 115, 127, 124, 118, 120, 122, 111, 102, 115, 107, 116, 118, 120
9.7.18 know how to construct cumulative percentage frequency curves ***(k)***	**9.7.18.1** use the given curve (ogive) to find the percentiles and quartiles of given scores **9.7.18.2** find the median, mode for a set of scores using percentiles	**6.** a large jar contains 25 black marbles, 34 blue marbles and 11 white marbles.
STEM PLOTS **9.7.19** know that Stem Plots is another method that can be used to represent numerical data ***(k)***	**9.7.19.1** identify the Stemplot Graphs and its features and properties	**(a)** A sample of 10 marbles is drawn from the jar. What would you expect the sample to contain if it truly represented the contents of the jar? **(b)** If you drew five such samples from the jar, would you expect them all to be the same?
9.7.20 know how to display data using Ordered Stem – and – Leaf plot ***(k)***	**9.7.20.1** display given numerical data in an ordered stem – and – leaf plot	
9.7.21 know how to calculate the Median and any Quartiles using ordered stem – and – leaf plots ***(k)***	**9.7.21.1** calculate the Median and Quartiles of a set of scores using the formula and Stemplots	**7.** a bakery records the number of sales of a new type of specialty bread over a 60-day period. The number of sales of the bread are summarised in the table.
BOX PLOTS AND MEASURES OF SPREAD **9.7.22** know that Boxplot is an excellent way of displaying the Median and Quartiles ***(k)***	**9.7.22.1** define Box plot **9.7.22.2** identify the Four (4) Steps that must be followed to construct a Box plot	
9.7.23 know how to calculate the Median and Quartiles of a set of scores and display them using Boxplots ***(k)***	**9.7.23.1** calculate the value for the Median and Various Quartiles (Q1, Q2, Q3) for given data	

No of loaves	Frequency (f)
60 - 69	2
70 - 79	2
80 - 89	3
90 - 99	6
100 - 109	12
110 -119	13
120 - 129	15
130 - 139	7

Subject: MATHEMATICS **Year: 9**

Strand: PROBABILITY AND STATISTICS

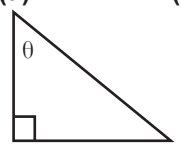
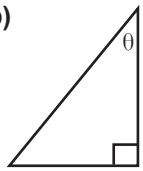
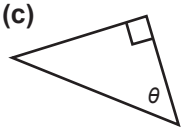
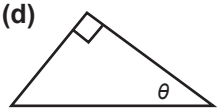
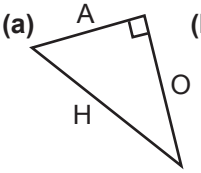
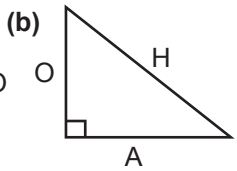
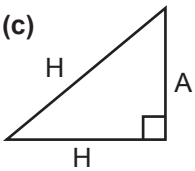
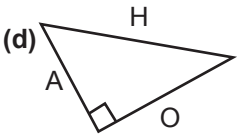
Sub-strand: 9.7 STATISTICS (15 periods)

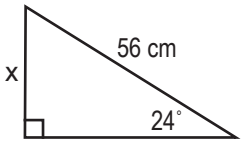
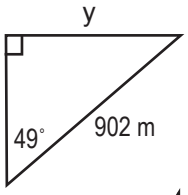
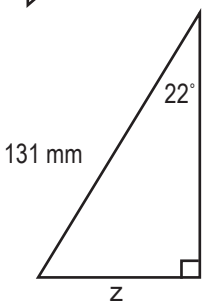
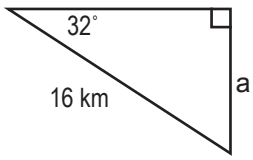
General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.7.24 know how to draw Boxplots using Cumulative Percentage Frequency Curve ***(k)***	**9.7.24.1** draw a Cumulative Frequency Curve for given set of data **9.7.24.2** draw Box plots using Cumulative Percentage Frequency Curve **9.7.24.3** identify the Five (5) Number Summary using the Cumulative Percentage Frequency Curve	use the grouped data to: **(i)** calculate the mean number of sales (give your answer correct to two decimal places). **(ii)** calculate the median class interval for the number of sales **(iii)** draw a bar chart of the sales (iv) describe the spread of the data.
9.7.25 know that two or more sets of scores can be constructed as Parallel Boxplots which can be used to compare data ***(k)***	**9.7.25.1** construct Parallel Boxplots on same set of x – axis to represent given data **9.7.25.2** make comparison between two sets of data that are given as Parallel Boxplots	**8.** for each of the following stem plots, calculate the (i) mean, (ii) median and (iii) comment on the skewness of the data **(a)**
EXPLORING SAMPPLING **9.7.26** understand why Sample data is better when dealing with very big data ***(u)***	**9.7.26.1** define and identify Sample Population **9.7.26.2** identify reasons why it's better to use Sample Population when dealing with big data	**STEM** | **LEAF** 4 | 8 5 | 2 3 4 5 6 7 7 6 | 4 5 5 6 7 7 | 3 4 5 8 | 2 9 | 1 10 | 9
9.7.27 know that there are two (2) ways that can be used to choose Sample Data that are Not bias ***(k)***	**9.7.27.1** identify the Two (2) Methods that can be used to choose Sample Data that are Not bias - Random Sampling - Stratified Sampling **9.7.27.2** define the following terms: ***Random*** *and* ***Stratified*** *Sampling*	**(b)** **STEM** | **LEAF** 11 | 5 7 12 | 4 5 13 | 2 3 4 9 14 | 0 0 2 3 4 15 | 6 7 8 9 9 9 16 | 1 3 3 4 5 6 17 | 0 5 6 7 8
9.7.28 know how to collect sample data using Random Sampling and Stratified Sampling ***(k)***	**9.7.28.1** collect sample data Randomly using a calculator with a formula **9.7.28.2** collect sample data using Stratified Sampling where populations are given in ratios	**(c)** **STEM** | **LEAF** 21 | 0 2 22 | 1 8 8 23 | 0 1 2 3 24 | 1 2 5 6 7 9 25 | 1 2 3 26 | 1 1 3 27 | 1 2

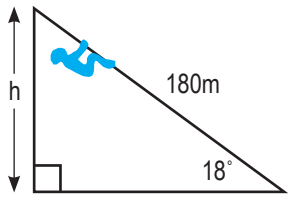
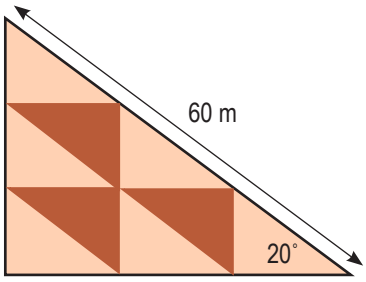
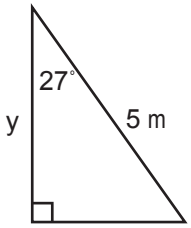
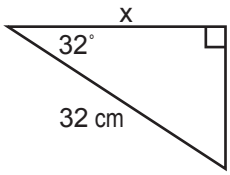
Subject: MATHEMATICS **Year: 9**

Strand: TRIGONOMETRY

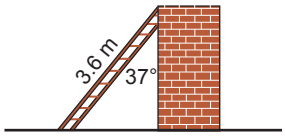
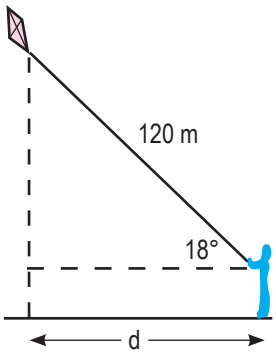
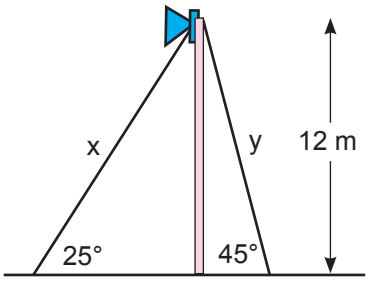
Sub-strand: 9.8 TRIGONOMETRY (15 periods)
Trigonometry comes from the word trigon which is Latin for triangle. It deals specifically with the Right – Angle Triangle and the that are relationships between angles and sides of the triangle. Sides and angles are compared and calculated through the use of trigonometric function: *Sine, Cosine* and *Tangent ratios*. The ratios of the various sides and angles of the right – angle triangle are always the same regardless of the overall size of the triangle. The three sides of the triangle are named and determined by the position of the chosen angle. The side opposite to the right angle is called Hypotenuse and the side opposite to the angle is called Opposite side and the side attaches to the angle from the side is called the Adjacent side. The trigonometrical functions can be used to determine the missing sides and angles of any right – angle triangle and also the angle of evaluation and depression and also with the skills of solving practical problems using bearings.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
LABELLING A RIGHT ANGLE TRIANGLE **9.8.1** understand that Trigonometry works only for Right – Angled Triangle ***(u)***	**9.8.1.1** identify the right angle triangle **9.8.1.2** name and Label the sides of the right-angle triangle to a given angle. *Hypotenuse, Adjacent* and *Opposite*	1. label the sides of the following triangles with the letters H (hypotenuse), O (opposite) and A (adjacent). **(a)**  **(b)** 
EXPLORING THE SINE RATIO **9.8.2** exploring and examine the relationships between the Opposite Side and the side Hypotenuse in a right angle triangle of a given angle ***(s)***	**9.8.2.1** give the name to the *Ratio* that compares the *Opposite Side* to the *Hypotenuse* to a given angle of a right angle triangle – *SINE RATIO* **9.8.2.2** name or identify the Sine Ratio: ***Sine Ratio = Opposite Side / Hypotenuse***	**(c)**  **(d)** 
FINDING THE LENGHT OF THE OPPOSITE SIDE **9.8.3** know how to find the length of Opposite Side of the right angle triangle using Sine Ratio ***(u)***	**9.8.3.1** calculate the length of the side Opposite to a given angle using the *Sine Ratio*	**2.** place the angle θ in these triangles to match the labels. **(a)**  **(b)** 
9.8.4 know how to solve Practical word problems using Sine Ratio ***(k)***	**9.8.4.1** calculate and solve word problems using the Sine Ratio	
EXPLORING THE COSINE RATIOS **9.8.5** exploring and examine the relationships between the Adjacent Side and the Hypotenuse in a right angle triangle ***(s)***	**9.8.5.1** give the Name to the ratio that compares the Adjacent side and the Hypotenuse **9.8.5.2** name or identify the Cosine Ratio: ***Cosine Ratio = Adjacent Side / Hypotenuse***	**(c)**  **(d)** 

Subject: MATHEMATICS	Year: 9	
Strand: TRIGONOMETRY		
Sub-strand: 9.8 TRIGONOMETRY (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
FINDING THE LENGTH OF THE ADJACENT SIDE **9.8.6** know how to find the length of Opposite Side of the right angle triangle using Sine Ratio ***(u)***	**9.8.6.1** calculate the lengths of the side *Adjacent* to a given angle using the *Cosine Ratio*	**3.** find the length of the side marked with a pronumeral, expressing answers correct to 2 decimal places. **(a)**  **(b)**  **(c)**  **(d)** 
9.8.7 know how to solve Practical word problems using Sine Ratio ***(k)***	**9.8.7.1** calculate and solve word problems using the Cosine Ratio	
FINDING THE HYPOTENUS **9.8.8** know how to identify and name the Hypotenuse side of the right angle triangle ***(k)***	**9.8.8.1** identify and name the Hypotenuse side of the right angle triangle	
9.8.9 know how to find the length of the Hypotenuse side of the right angle triangle ***(k)***	**9.8.9.1** find the length of the Hypotenuse Side of the Right angle triangle when it is a Numerator and Denominator	
9.8.10 know how to solve word problems that deal with the Hypotenuse ***(k)***	**9.8.10.1** solve word problems that deal with Hypotenuse side of the right angle triangle	
FINDING ANGLES USING SINE AND COSINE **9.8.11** know how to find missing angles in right angle triangles using Sine and Cosine Ratios ***(k)***	**9.8.11.1** calculate the missing angles using Sine and Cosine Ratios **9.8.11.2** solve Practical word problems using the Cosine and Sine Ratios	
USING THE TANGENT RATIO **9.8.12** know how to find the Opposite Side to given angles using the Tangent Ratio ***(u)***	**9.8.12.1** identify the sides Adjacent and Opposite to given angle **9.8.12.2** name the Tangent Ratio ***Tangent Ratio = Opposite Side / Adjacent Side***	
9.8.13 know how to find the Opposite and Adjacent Side to given angles using the Tangent Ratio ***(k)***	**9.8.13.1** calculate the length of the opposite and adjacent sides of the right angle triangle using the Tangent Ratio	
9.8.14 know how to find missing angles in a right angle triangle using Tangent Ratio ***(k)***	**9.8.14.1** find missing angles using Tangent Ratio	

Subject: MATHEMATICS	Year: 9	
Strand: TRIGONOMETRY		
Sub-strand: 9.8 TRIGONOMETRY (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.8.15 know how to Solve Practical situations given in words ***(k)***	**9.8.15.1** calculate various practical situations given in words using the Tangent ratio	**4.** Nellie slides down the 180-metre-long wire shown here. Find the vertical drop (h). 
ANGLES OF ELEVATION AND DEPRESSION **9.8.16** know that the angles of Depression and Elevation are measured against the two horizontal lines ***(k)***	**9.8.16.1** define angle of Elevation and Depression **9.8.16.2** identify and differentiate between the angle of elevation and depression	
9.8.17 know how to calculate the angles of elevation and depression ***(k)***	**9.8.17.1** calculate the angle of depression and elevation in given diagrams **9.8.17.2** solve various practical word problems that deal with angles of elevation and depression	**5.** this abstract painting is made up of nineidentical triangles. Use the diagram to find: **(a)** the height of the painting **(b)** the height of each triangle 
TRIGONOMETRY AND BEARINGS **9.8.18** understand how bearing is being used to track down the directions in object that moves ***(u)***	**9.8.18.1** define bearings **9.8.18.2** identify the starting points for the movement of all bearings	
9.8.19 know that bearings are measured using two methods: Conventional Bearings & True Bearings ***(k)***	**9.8.19.1** define and differentiate Conventional and True Bearings	
9.8.20 know how to calculate bearing using those two methods in practical situations ***(k)***	**9.8.20.1** find the bearings of given diagrams **9.8.20.2** draw diagrams to represent given bearings **9.8.20.3** covert one measurement of bearings from Conventional to True bearings and vice versa **9.8.20.4** calculate various Practical word problems using the Conventional and True bearings	**6.** find the length of the sides marked with a pronumeral, expressing the answers correct to 2 decimal places. **(a)** 
EXPLORING THE UNIT CIRCLE **9.8.21** know that a unit circle with a radius of one (1) unit can be used to find the Trigonometrical Ratios ***(k)***	**9.8.21.1** identify the Unit Circle with its scales that can be used to find trigonometrical ratios and angles	**(b)** 

Subject: MATHEMATICS	Year: 9
Strand: TRIGONOMETRY	
Sub-strand: 9.8 TRIGONOMETRY (15 periods)	

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.8.22 know how to find ratio values for given angles of Sine and Cosine using the Unit Circle with a radius of 1 unit ***(k)***	**9.8.22.1** read – off the values of given Sine θ and Cosine θ angles using the Unit Circle with a radius of 1 unit **9.8.22.2** measure the angles for given points and determine their Sine and Cosine values using the Unit Circle	**7.** a piece of timber 3.6 metres long leans against a wall. If the angle between the wall and the timber is 37°, find the height of the wall to the nearest centimetre. 
9.8.23 know how to estimate the size of angles for sine or cosine using the Unit Circle ***(k)***	**9.8.23.1** estimate to the nearest degree the corresponding angles for given Sine and Cosine ratios in decimal Values	**8**. Tim is flying a kite using a string of length 120 metres. Find the horizontal distance (d) from Tim to the kite. 
EXPLORING TRIGONOMETRIC GRAPHS **9.8.24** know how to plot the trigonometrical graph the Sine Ratio in the form: ***y* = Sin *x*** ***(k)***	**9.8.24.1** complete the table by filling the missing numbers for Sine Ratio using Three Figure Tables or Calculators **9.8.24.2** draw the graph of the Sine Ratio	
9.8.25 know how to plot the trigonometrical graph the Cosine Ratio in the form ***y* = Cos *x*** (k)	**9.8.25.1** complete the table by filling the missing numbers for Cosine Ratio using Three Figure Tables or Calculators **9.8.25.2** draw the graph of the Sine Ratio **9.8.25.3** identify the differences between the two trigonometrical graphs for sine and Cosine ratios	**9.** a loudspeaker is mounted on the top of a pole that is 12 metres tall. The pole is kept vertical by two wires. One wire (x) makes an angle of 25° with the ground and the other one (y) makes an angle of 45° with the ground. Find the length of each wire. 

Subject: MATHEMATICS **Year: 9**

Strand: ALGEBRA

Sub-strand: 9.9 LINEAR EQUATIONS AND FORMULAS (10 periods)
Linear equation refers to a mathematical statement that is equated to a given numerical value with variables in the equation representing missing values that can be determined. Linear equation when expressed graphically would give a straight line graph. Computational algorithms which are used to find solutions for the linear equation is the important part of the numerical linear algebra. A solution to a linear equation is an assignment of a numerical value to the variable that would make the statement true.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
ONE – STEP EQUATIONS: A REVIEW **9.9.1** know how to find the value for pronumerals for given equations using one-step or Inverse operation ***(k)***	**9.9.1.1** find value of pronumerals for simple equations using one-step or inverse operation **9.9.1.2** write equations for given maths statements and solve them	**1.** solve the equations: **(a)** $x + 6 = -2$ **(b)** $n - 8 = -5$
SOLVING TWO-AND THREE-STEP EQUATIONS **9.9.2** know how to solve equations that may involve two – three steps ***(k)***	**9.9.2.1** solve complex equations that would take two – to – three steps to solve using inverse operations	**2.** solve the following equations: **(a)** $\frac{x}{2} + \frac{x}{5} = 7$ **(b)** $\frac{3a}{4} + 8 = 5$
9.9.3 know how to write mathematical sentences into equations and solve them ***(k)***	**9.9.3.1** write equations for given maths statements and solve them using inverse operations	**3.** solve the following equations: **(a)** $-7a - 19 = 16$ **(b)** $-5b + 9 = 29$ **(c)** $7 - 5c = -18$ **(d)** $\frac{a - 5}{6} = -2$ **(e)** $\frac{2x + 1}{3} = 5$
EQUATIONS INVOLVING BRACKETS **9.9.4** understand that equations with brackets can solve by removing the brackets from the equations ***(u)***	**9.9.4.1** solve given equations with brackets by removing the brackets **9.9.4.2** write equations for given maths statements and solve them	
FURTHER EQUATIONS **9.9.5** know how to solve for pronumerals in complex equations that have fractions ***(k)***	**9.9.5.1** solve complex equations that have fractions	**4.** solve the following equations: **(a)** $4(2 - x) = -3(x + 4)$ **(b)** $-3(q - 7) = 4(5 - q)$ **(c)** $4(3x - 1) = -5(6 - 2x)$ **(d)** $\frac{3x}{2} + \frac{x}{8} = 13$
9.9.6 know how to write fractional equations for maths statements and solve them ***(k)***	**9.9.6.1** write fractional equations for given maths statements then solve them	
EXPLORING INEQUATION **9.9.7** understand that Inequality is found around us and is used when quantities are NOT EQUAL to ONE QUANTITY ***(u)***	**9.9.7.1** define Inequation **9.9.7.2** identify the four (4) Inequation Signs: - ≤: *Less than or Equal to* - ≥: *Greater than or Equal to* - <: *Less than* - >: *Greater than*	**5.** solve the following inequations: **(a)** $4x - 8 \geq -24$ **(b)** $9 + 2y < 15$ **(c)** $6z - 2 \leq -32$ **(d)** $-2a + 13 < 9$ **(e)** $-5b + 4 \geq -11$ **(f)** $8 - 5c < 18$

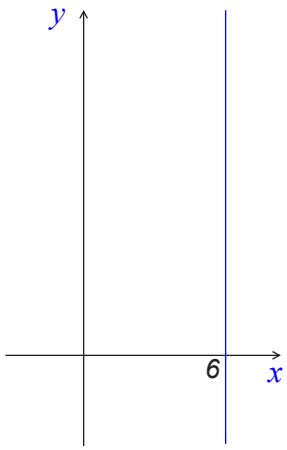
Subject: MATHEMATICS	Year: 9	
Strand: ALGEBRA		
Sub-strand: 9.9 LINEAR EQUATIONS AND FORMULAS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.9.8 know how to use the Inequation Signs: <,>, ≤ and ≥ to make statement true ***(k)***	**9.9.8.1** identify any of the four (4) Inequations signs that can be used to make maths statements true	**6.** solve the following literal equations for x. **(a)** $\frac{ax}{b} + c = d$
9.9.9 understand how to deal with Inequality signs when numbers are divide by negative numbers ***(u)***	**9.9.9.1** solve Inequations that are divided by 'negative' numbers. ***Note:*** *When we solve an inequation, by dividing it by a Negative number* ***Reverse*** *the* ***inequality sign****.*	**(b)** $\frac{nx}{m} - p = -q$ **(c)** $\frac{qx}{-p} - r = t$
INEQUATIONS **9.9.10** understand that Inequation occurs when the equal sign (=) is replaced by the four Inequations (not equal) signs , ≥, > and < ***(u)***	**9.9.10.1** complete sentences to make them true by using the 4 unequal signs: ≤ , ≥, > and <	**7.** substitute the given values and solve for the remaining variable in each formula.
9.9.11 know how to use the Number Line to display Inequation solutions ***(k)***	**9.9.11.1** write Inequations statements and display the solutions on a Number Line **9.9.11.2** solve Inequations and display the solutions using the number line	**(a)** $A = 2\pi r\,(r + h)$ where $r = 7$, $h = 9$ **(b)** $s = ut + 5t^2$ where $u = 3$, $t = 4$ **(c)** $c = \sqrt{a^2 + b^2}$ where $a = 7$, $b = 24$
9.9.12 know how to solve inequations algebraically ***(k)***	**9.9.12.1** solve algebraic algebraically and display them using Number Line	**(d)** $V = \frac{4\pi r^3}{3}$ where $r = 9$
LITERAL EQUATIONS **9.9.13** know that equations with many pronumerals are known as Literal Equations ***(k)***	**9.9.13.1** define Literal Equation **9.9.13.2** write equations for given statements that involve several pronumerals	**8.** transpose each of the following formulas to make the required variable the subject. **(a)** $A = 2\pi rh$, transpose to make r the subject **(b)** $100I = PRT$, transpose to make T the subject **(c)** $v = u + at$, transpose make a the subject **(d)** $V = L^2H$, transpose to make L the subject **(e)** $V = \pi r^2h$, transpose to make r the subject.
9.9.14 know how to solve given equations with several pronumerals ***(k)***	**9.9.14.1** solve Literal Equations	
APPLYING FORMULAS **9.9.15** understand Formula and how they are put together to relate several variables that are represented by pronumerals ***(u)***	**9.9.15.1** define the term Formula **9.9.15.2** identify different formulae	
9.9.16 know how to solve for Pronumerals by substituting values to replace variables in given formulae ***(k)***	**9.9.16.1** solve by substituting values into given formulas to find the answers to the remaining pronumerals	

Subject: MATHEMATICS	Year: 9	
Strand: ALGEBRA		
Sub-strand: 9.9 LINEAR EQUATIONS AND FORMULAS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
TRANSPOSING FORMULAS **9.9.17** understand how formulae can be re-arranged to all the pronumerals become the subject ***(u)*** **9.9.18** know how to rearrange a formula to make a variable become the subject and solve for the required variable by substitution ***(k)***	**9.9.17.1** define Transposing Formula **9.9.17.2** identify different formulae **9.9.18.1** re-arrange formulas to make a pronumeral to become the subject **9.9.18.2** transpose a given formula to make a variable become the subject **9.9.18.3** solve equations by substituting values to formulae	**9.** when an amount of money P (the principal) is invested in an account that pays R per cent per annum compound interest, the amount A that it grows to after n years is given by the formula $A = P\left(1 + \frac{R}{100}\right)^n$ If $1000 (P) grows to $1210 (A) after 2 years (n), find the compound interest rate R.

Subject: MATHEMATICS **Year: 9**

Strand: ALGEBRA

Sub-strand: 9.10 LINEAR GRAPHS (10 periods)
A linear graph is a graph that will always have a straight line graph. To sketch the graph a minimum of two points are needed. All other points will fall on the line that drawn through those two points. A linear equation can be written in the form of $y = mx + c$ where m is the gradient and c is the y – intercept (graph cuts through the y axis at (0, c). The following are the methods that can be used to graph a linear graph: Graphing lines using x and y Intercepts and the Gradient and y – Intercept method. Gradient can be determined by looking at rate of Rise over the rate of Run.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
PLOTTING POINTS ON THE CARTESIAN PLANE **9.10.1** understand how the Cartesian plane is used to locate the positions of points in the plane ***(u)***	**9.10.1.1** name and identify parts of the Cartesian Plane: - ***x and y axes*** The **Origin** (0,0) **9.10.1.2** find the coordinates of the points that are given in the Cartesian plane using the x and y axis (x,y)	**1.** on a set of axes of your own, sketch the following straight lines using the intercept method: **a.** y = x + 1 **b.** y = x + 2 **c.** y = x + 4
9.10.2 know how to draw set of axes on the Cartesian plane and use x and y axis to find the positions of points in the plane ***(k)***	**9.10.2.1** draw Cartesian planes and find the coordinates using x and y of given points on the plane **9.10.2.2** plot coordinates (x,y) pairs on to the grid	**2.** write down the equations for each of the following lines: **a.** 
PLOTTING STRAIGHT LINE GRAPHS **9.10.3** understand that an equation would create relationships between points that y- value would always have corresponding x-value that would create straight lines graphs ***(u)***	**9.10.3.1** define and identify Straight Line Graphs **9.10.3.2** find the corresponding y value for x that are given in tables	
9.10.4 know how to graphs equations that are derive from practical questions ***(k)***	**9.10.4.1** plot coordinate points that are given in tables on to the plane **9.10.4.2** plot the graph for practical problems using x and y values	
USING THE *X* AND *Y* INTERCEPT **9.10.5** understand that straight line graphs can be graphed by using the x and y Intercepts ***(u)***	**9.10.5.1** calculate the values for x and y Intercepts **9.10.5.2** graphs equations by plotting the x and y intercepts and join them with a straight line	
HORIZONTAL AND VERTICAL LINES **9.10.6** understand that there are graphs that do not have slope (gradient) that are given in the form of x = c , and y = c which have vertical and horizontal lines (u)	**9.10.6.1** find the equations for given vertical and horizontal lines **9.10.6.2** sketch and graph equations that are given in the form of y = c and x = c	

Subject: MATHEMATICS	Year: 9	
Strand: ALGEBRA		
Sub-strand: 9.10 LINEAR GRAPHS (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
GRADIENT OF STRAIGHT LINES **9.10.7** know that the steepness of the straight line graph is the rate at which the straight line rises or fall ***(k)***	**9.10.7.1** define Gradient of a linear graph	**3.** draw a set of Cartesian axes on graph paper. Let 1 centimetre represent 1 unit, and allow the values on both the x- and y-axes to run from –6 to +6.
9.10.8 know how to find the gradient of a straight line graph ***(k)***	**9.10.8.1** find the gradient of graphs by getting two points on the graph **9.10.8.2** find the gradients of graphs using the formula: $\frac{y2 - y1}{x2 - x1}$	**(a)** plot the points (0, 2), (3, 3), (4, 5) and connect these points to form a triangle. **(b)** reflect the points in part a across the x-axis and draw the image of the triangle. Clearly label the coordinates of the vertices.
THE GRADIENT AND Y - INTERCEPT **9.10.9** know that linear graphs that are given in the form of ***y = mx + c*** can be graphed using the gradient and y – intercept method ***(k)***	**9.10.9.1** sketch Linear Graphs for given equations in the form of: $y = mx + c$ by finding two points: the ***Y – Intercept*** and the ***Gradient***, join those two points with a straight line	**(c)** next draw the reflection of the triangle in part a about the line y = x and label the coordinates of the vertices. **(d)** finally, draw the reflection of the triangle in part a about the y-axis and label the coordinates of the vertices.
9.10.10 know how to identify gradients of given linear equations then graph them ***(k)***	**9.10.10.1** find the Gradients for given linear graphs **9.10.10.2** find the gradients and y-intercepts for given equations **9.10.10.3** find the equations when gradients and y-intercepts are given **9.10.10.4** re-arrange given equations into the form $y = mx + c$ then find the gradient, y-intercept and then graph the equations	**4.** on a set of axes, sketch the following straight lines by using the intercept method: **(a)** y = x + 2 **(b)** y = –2x + 4 **(c)** 3y + 4x = 12 **(d)** 2x − 3y = 6 **(e)** 5x + 2y − 10 = 0 **(f)** 3x − 5y − 30 = 0
FINDING THE EQUATION OF A LINE **9.10.11** know that the equations of straight line graphs can be calculated by finding the y – intercept and the Gradient of the graph ***(k)***	**9.10.11.1** find the equation of given linear graphs by finding the y – intercepts and the Gradient **9.10.11.2** finding the equation of lines that pass through given points	

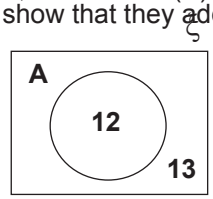
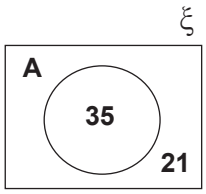
Subject: MATHEMATICS **Year: 9**

Strand: PROBABILITY AND STATISTICS

Sub-strand: 9.11 PROBABILITY (15 periods)
Probability is a way of expressing knowledge or belief that an event will occur or has occurred. Probabilities can be calculated by considering all the equal chances of an event to occur. In mathematics, a probability of an event *A* is represented by a real number in the range from 0 to 1 and written as P(*A*), p(*A*) or Pr(*A*). An impossible event has a probability of 0, and a certain event has a probability of 1. The probability of a random event can be determined by finding the relative frequency of occurrence of an outcome of an experiment when repeated. Probability of events can be determined by adding and multiplying with their complementary and mutually exclusive events.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
EVENT SPACES **9.11.1** understand that Probability can be used to find the chance of an event to occur ***(u)***	**9.11.1.1** define Probability **9.11.1.2** define Event Space **9.11.1.3** identify the Formula that is used to calculate the probability of an event *Prob of Event =* *no. of favourable outcomes* *Total no of Possible Outcomes*	**1.** when two dice are thrown, what is the probability that: **(a)** they both show a 6? **(b)** they show the same number? **(c)** the sum of the numbers shown is greater than 8? **(d)** the difference between the numbers is less than 2?
9.11.2 know how to display sample space of an event and calculate probability of given events using Tree and Lattice Diagram ***(k)***	**9.11.2.1** identify the two (2) methods used to display total possible outcomes (event space) for one or more events - *Lattice Diagram (Grid)* - *Tree diagram* **9.11.2.2** display sample space of events using Grid (Lattice diagram) and Tree diagram **9.11.2.3** find the probability of events using the above Probability Formula	**2.** what is the probability that the answers to two multiple-choice questions with five possible answers A–E: **(a)** are both C? **(b)** are the same? **(c)** are different? **3.** what is the probability that when two people are selected at random: **(a)** they are both Taurean? **(b)** they are the same star sign? **(c)** only one is a Taurean? **(d)** they are different star signs?
COMPLEMENTARY EVENTS **9.11.3** understand that Complementary Events only work for events that have two equal likely outcomes ***(u)***	**9.11.3.1** define Complementary Events **9.11.3.2** identify events that must have two outcomes that Complement to each other	**4.** what is the probability that when two people randomly select a playing card: **(a)** they both select a red card? **(b)** they both select a heart? **(c)** only one selects a heart? **(d)** only one selects a black card? **(e)** they select cards of the same suit? **(f)** they select cards of a different suit?
9.11.4 know how to find events that would occur and would **not** occur ***(k)***	**9.11.4.1** calculate the probability of events that are Complementary to each other •***Probability of an event + Probability of its complement = 1*** *so complement of **A** is **A*** *Therefore* **Pr(*A*) = 1 Pr(*A*) or Pr(A) = 1 – Pr(A')**	**5.** when three coins are tossed, what is the probability of: **(a)** three heads? **(b)** no heads? **(c)** at least one head?
9.11.5 understand how Venn Diagram is used to display complementary events ***(u)***	**9.11.5.1** use the Venn Diagram to show or display complement events with regards to the number of outcomes in a set	**6.** in a three-child family, what is the probability of: **(a)** three girls? **(b)** two boys? **(c)** a boy and a girl?

Subject: MATHEMATICS	Year: 9
Strand: PROBABILITY AND STATISTICS	
Sub-strand: 9.11 PROBABILITY (15 periods)	

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
THE ADDITIONAL LAW OF PROBABILITY **9.11.6** understand that two (2) sets can be added when they are in Union ***(u)***	**9.11.6.1** identify the Symbols that are used for Union: ∪ and Intersection: ∩ **9.11.6.2** Add sets using Additional Law: If "OR" is used it means "ADD" *Two (2) Approaches* *- find the probabilities and add them together* *- use formula:* $Pr(A \cup B) = Pr(A)+Pr(B)-Pr(A \cap B)$	**7.** for each Venn diagram shown below, calculate Pr(A) and Pr(A′) and show that they add to 1. **(a)** 
MUTUALLY EXCLUSIVE EVENTS **9.11.7** understand that Two events are mutually exclusive if it is impossible for them both to happen and they do not over-lap ***(u)***	**9.11.7.1** define Mutually Exclusive Events **9.11.7.2** identify events that are Mutually Exclusive	**(b)** 
9.11.8 know how to calculate the probability of events that are mutually exclusive ***(k)***	**9.11.8.1** find probabilities using Venn Diagrams that represent sets that are Mutually Exclusive **9.11.8.2** calculate probabilities of events that are Mutually Exclusive	**8.** Copy the diagram and shade the area that corresponds to each of the following. **(a)** A **(b)** B **(c)** (A ∩ B) **(d)** (A ∪ B)
MULTIPLICATION LAW **9.11.9** understand that Two or more events are **independent** if the result of one event does not have an effect on the other events ***(u)***	**9.11.9.1** define and identify Independent Events **9.11.9.2** identify the general equation for two events that occur Independently **Pr(*A* and *B*) = Pr(*A*∩*B*) = Pr(*A*) × Pr(*B*)**	**9.** a student is asked to choose a number between 10 and 30 inclusive. (a) what is the probability that the number is: i. a prime number? ii. an even number? iii. an odd number? iv. divisible by 3? v. divisible by 5? vi. divisible by 7?
9.11.10 know how to calculate probabilities of events that occur independently of each other ***(k)***	**9.11.10.1** calculate the probability of events that occur independently of each other	**(b)** What is the probability that the number is: i. a prime or an odd number? ii. an even number or divisible by 7? iii. an even or a prime number? iv divisible by 3 or 7? v divisible by 5 or 7? vi divisible by 3 or 5?

Subject: MATHEMATICS	Year: 9	
Strand: PROBABILITY AND STATISTICS		
Sub-strand: 9.11 PROBABILITY (15 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
ODDS **9.11.11** know that Odd probabilities are estimations that are done based on past results and experiences ***(k)***	**9.11.11.1** define Odd probability. High Odds mean that event is less likely to occur **9.11.11.2** identify events where Odd probability is being used	**(c)** which of the situations in part b are mutually exclusive? Explain your answer.
9.11.12 know that Odds are expressed in the form of Ratio ***(k)***	**9.11.12.1** express Odd Probabilities in Ratio Form **ways to lose : ways to win**	
9.11.13 know how to find Odds and Probability and Vice Versa ***(k)***	**9.11.13.1** convert probabilities to Odds and vice versa *To convert Odds to probabilities, use the formula given below:* **Pr (win)** = ways to win / ways to win + ways to lose	
9.11.14 know how to determine the Payout on a bet with the given Odd ***(k)***	**9.11.14.1** use formula to calculate Unit Payout Unit Payout = Payout / Original bet **9.11.14.2** calculate the expected return using the formula Payout = Bet x Odds + Bet	

Subject: MATHEMATICS **Year: 9**

Strand: NUMBERS

Sub-strand: 9.12 INDICES (10 periods)
Exponentiation is a mathematical operation, written as a^n. It involves two numbers: the **base "*a*"** and the **exponent "*n*".** When ***n*** is a positive integer, exponentiation corresponds to repeated multiplication: a^3 = a x a x a. The exponent is usually shown as as superscript to the right of the base. The exponentiation a^n can be read as: *a raised to the n-th power*, *a raised to the power [of] n* or possibly *a raised to the exponent [of] n*. Some exponents have their own pronunciation: for example, a^2 is usually read as *a squared* and a^3 as *a cubed*.

General Learning Outcomes	Specific Learning Outcomes	Suggested Assessment Events
Learners should	***Learners should be able to***	***Learners can be assessed on***
INDEX NUMBERS **9.12.1** know that numbers can be expressed or written in many ways such as *Index Form* and *Factor Form* ***(k)***	**9.12.1.1** define and identify the following terms: *Index numbers*, *Exponential numbers, Factor form* and *Basic numeral* ***Index or Power or Exponent*** 5^3 means $\underline{5 \times 5 \times 5} = \underline{125}$ ***Base*** ***Factors*** ***Basic numeracy***	**1.** write each of the following in factor form and then evaluate to a basic numeral: **(a)** 3^5 **(b)** $(-2)^4$ **(c)** -7^2 **(d)** $\left(\frac{2}{3}\right)^3$
9.12.2 know how to express numbers in different forms: index notation and factor forms ***(k)***	**9.12.2.1** change Index numbers into factor form and evaluate and vice versa **9.12.2.2** evaluate Index numbers to give basic numbers	**2.** write in index form, simplifying where possible: **(a)** 2ab × 3ba × 5c × bc **(b)** 7xy × 3yz × yz× 4xy **(c)** 3pq × 6qr × 3pr × 2qp **(d)** –4yx × 2zx × 5zy **(e)** 3ab × –bc× –2ac **(f)** –st× 2tr × –4srt × 3rs
APPLYING THE INDEX LAWS **9.12.3** recognise and apply the Index Laws that deal with multiplication and Division of Indices ***(s)***	**9.12.3.1** identify Index Laws that deal with Multiplication and Division of Index Numbers **9.12.3.2** simplify Indices using multiplication and division laws for indices **-Index Law 1: $b^x \times b^y = b^{x+y}$** ***Multiply: ADD Powers*** **-Index Law 2: $b^x \div b^y = b^{x-y}$** ***Divide: SUBTRACT Powers***	**3.** simplify the following. **(a)** $5x^2y^3 \times 6x^2y^2$ **(b)** $2x^1y^3 \times 7x^2y^4$ **(c)** $2x^2y^2 \times 5x^2y^2$ **(d)** $\frac{-25m^3n^2}{-5m^2n}$
MANAGING BRACKETS AND THE ZERO POWER **9.12.4** recognise Index Laws that deal with expansion of brackets by multiplying outside powers to inside powers ***(s)***	**9.12.4.1** identify and recognize Index Laws that expand (remove) brackets - **Index Law 3:** $(x^p)^q = x^{p \times q}$ - **Index Law 4:** $(xy)^p = x^p y^p$ - **Index Law 5:** $\left(\frac{x}{y}\right)^p = \frac{x^p}{y^p}$ **9.12.4.2** simply expressions and evaluate them **9.12.4.3** simplify expressions by removing brackets	**4.** simplify the following as far as possible. **(a)** $\frac{12x^3}{2y} \times \frac{8y^2}{4x}$ **(b)** $\frac{-16b^7x^5}{3a^4b^2} \times \frac{9a^9b^4}{-4b^3a^6}$

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.12 INDICES (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
9.12.5 understand that any base to a Power of ZERO is equal to 1 ***(u)***	**9.12.5.1** identify Index Law that deal with a base that has its Powers equal to ZERO ***Any base to the power of zero Equals to one (1).*** $b^0 = 1$ **9.12.5.2** simplify and evaluate expressions with powers including those with power of zero	**5.** simplify the following. **(a)** $(8y)^0$ **(b)** $9(8y^4)^0$ **(c)** $(2a^2b^0c^1)^4$ **(d)** $\left(\frac{-4r^2s^1t}{u^2v^3w}\right)^3$
NEGATIVE INDICES **9.12.6** understand that Negative Indices are bases with negative powers ***(u)***	**9.12.6.1** Identify Index Laws that deal with Negative Indices **In General:** $b^{-p} = \frac{1}{b^p}$ **so:** $\chi^{-3} = \frac{1}{\chi^3}$ **therefore;** $b^{-p} = \frac{1}{b^p}$ *and* $\frac{1}{b^{-p}} = b^p$	**6.** simplify the following expressions. **(a)** $\left(\frac{m^2}{8n^2}\right) \times \left(\frac{4m^1}{m^2}\right)^3$ **(b)** $\left(\frac{m^3}{5n^2}\right)^2 \times \left(\frac{10n^3}{m^2}\right)^2$
9.12.7 know how to simplify indices with negative powers to Basic Numerals and Positive Powers ***(k)***	**9.12.7.1** simplify negative indices to basic numerals **9.12.7.2** simplify negative indices by removing brackets **9.12.7.3** simplify negative indices to give Positive Powers	**7. s**implify the following, writing the answers as basic numerals. **(a)** 4^{-1} **(b)** $\frac{1}{3^{-3}}$ **(c)** $\frac{2}{4^{-2}}$ **(d)** $\left(\frac{3}{4}\right)^{-3}$
SIMPLE FRACTIONAL INDICES **9.12.8** understand that bases with fractional powers are simply the root of the denominator of the powers for given bases ***(u)***	**9.12.8.1** identify a Base with a power of ½ is the same as taking the square root of that base ***Example:*** $49^{\frac{1}{2}} = \sqrt{49}$ In general $\chi^{\frac{1}{2}} = \sqrt{\chi}$ for any non-negative	
9.12.9 know how to simplify fractional indices problems ***(k)***	**9.12.9.1** simplify Indices with fractional powers to basic numerals	

Subject: MATHEMATICS	Year: 9	
Strand: NUMBERS		
Sub-strand: 9.12 INDICES (10 periods)		
General Learning Outcomes	**Specific Learning Outcomes**	**Suggested Assessment Events**
Learners should	***Learners should be able to***	***Learners can be assessed on***
STANDARD FORM **9.12.10** understand that Standard Form is a special way of writing or expressing very big or small numbers using decimal and 10 as the Base ***(u)***	**9.12.10.1** write or express large numbers in standard form **9.12.10.2** express small number in standard form **9.12.10.3** express standard form numbers as basic numerals	**8.** simplify the following, writing the answers with positive powers. **(a)** $\frac{z^3x^{-1}}{y^{-4}}$
9.12.11 know that standard form can be calculated using index laws ***(k)***	**9.12.11.1** calculate standard form problems using index laws	**(b)** $\left(\frac{4m^{-1}}{n^{-2}}\right)^{-3} \times \left(\frac{8n^{-1}}{m}\right)^{2}$ **9.** simplify the following, writing the answers as basic numerals. **(a)** $81^{\frac{1}{2}}$ **(b)** $64^{\frac{1}{3}}$ **(c)** $81^{-\frac{1}{4}}$ **10.** simplify the following, writing the answers with positive powers. **(a)** $(16t)^{\frac{1}{2}}$ **(b)** $(64x^6)^{\frac{1}{3}}$ **11.** write the following basic numerals in standard form. **(a)** 500 000 **(b)** 120 000 000 **(c)** 80 000 **(d)** 22 000 000 **12.** write the following standard form numbers as basic numerals. **(a)** 1.7 × 104 **(b)** 4.07 × 103 **(c)** 3.6 × 106 **(d)** 7.25 × 108

Section 13. LEARNING AND TEACHING RESOURCES

This section contains a list of learner's books, teacher's guides and other learning and teaching resources for effective teaching and learning of Secondary Mathematics syllabus for years 7 to 9.

Resources	Year 7	Year 8	Year 9	Sources
Learner's Resources	▪Year 7 Learner's Book ▪ Ruler ▪ Compass ▪ Protractor ▪ Three Figure Table	▪ Year 8 Learner's Book ▪ Ruler ▪ Compass ▪ Protractor ▪ Three Figure Table	▪ Year 9 Learner's Book ▪ Three Figure Table	▪ Curriculum Development Division (CDD)
Teacher's Resources	▪ Year 7 Teacher's Guide ▪ 1 Metre Trundle Wheel ▪ 1 Metre Ruler ▪ Three Figure Table	▪ Year 7 Teacher's Guide ▪ 1 Metre Ruler ▪ Three Figure Table	▪ Year 9 Learner's Book ▪ Three Figure Table	▪ Curriculum Development Division (CDD)

Section 14. TOOLS AND EQUIPMENT

This section contains a list of tools and equipment for effective teaching and learning of Secondary Mathematics syllabus for years 7 to 9.

Items (Descriptions)
Calculators
Clock
Scale (Fish)
Bathroom Scale
Protractor
Tape Measure
Trundle Wheel
1 Metre Ruler
Measuring cups
Clinometer
Thermometer
Compass
Scissors
Stop Watch
Measuring Cylinders
Set Square
Counters, marbles and stones
Stationeries
Cellotape
Glues
Glue stick
Scissors

Section 15. FORMATIVE AND SUMMATIVE ASSESSMENT

The Secondary Mathematics Syllabus for Years 7 – 9 is written using the outcomes - based approach to education in Solomon Islands. This syllabus is based on an outcomes - based curriculum framework with a philosophy of a learner centred teaching pedagogy. It is based on learning outcomes as *curriculum standards*. These are *curriculum requirements* that should guide the planning for effective teaching and learning strategies as well as designing and setting of valid, fair and reliable assessments. These standards or curriculum requirements will become the *assessment benchmarks* for assessment at the school and national levels using both the formative and summative form of assessments.

Assessment is defined as a continued planned process of gathering, analysing and interpreting information and data about students learning. It is a process of seeking and interpreting evidences used by learners and their teachers, to identify where the learners are in their learning, and where they need to go to and how best to get there. It is important that teachers diagnose and identify learning abilities of the learners in order for them to develop and implement intervention strategies to improve both the learning process of learners and teaching approaches of the teachers. Teachers should support learners who have acquired the learning outcomes or curriculum requirements in order to maintain their level of performance and similarly assist leaners who have not acquired the requirements with remedial tasks. This is to enable learners to acquire curriculum requirements and progressed on with their learning. Therefore such assessment strategy is aiming towards improving learning and teaching processes and should focus more on a learner centred teaching pedagogy.

The assessment component in this syllabus involves both internal and external assessments and national examinations. Such an assessment approach is sometimes referred to as formative and summative assessments. However, assessment of learning outcomes differs in some ways from the traditional way of assessing objectives using the norm – referenced assessment. Assessment of learning outcomes focuses more on the criteria – referenced assessment and will allow learners to compete against set and agreed curriculum standards. The emphasis is more on formative and diagnostic form of assessments because it is an ongoing assessment in the classroom. The assessment of learning outcomes will be based on achievement levels. These levels have descriptors of possible performance abilities or skills at different intellectual and hierarchical competencies for each of the learning outcome assessed. Teachers will then be able to identify achievement levels for each student and be able to set remedial tasks to assist underachieving learners. The assessment data and information should be recorded and kept in a systematic and orderly manner as learning records in the schools.

The assessment information and data gathered from such assessments can be used for improving the learning and teaching processes in the classroom and for making informed decisions regarding assessments in the schools and national assessments and examinations. Furthermore, such information and data will also inform the Curriculum Development Division (CDD) and National Examination and Standards Unit (NESU) of the Ministry of Education and Human Resources Development (MEHRD) as well as the School of Education and Humanities (SOEH) of the Solomon Islands National University (SINU) on how the prescribed or the intended curriculum was taught and learnt in schools and how best to improve both the teaching and learning processes and implementation of valid, fair and reliable formative and summative assessments.

It is the Ministry's plan to examine *all subjects* at the end of Year Nine (9), the final year level at the end of the Universal Basic Education in Solomon Islands. It would mean that all subjects offered in the national curriculum would need to offer school base assessment (SBA) as part of the formative or continuous/internal assessment. The SBA should be implemented as part of the teaching and learning processes and is focussed more on learner centred teaching philosophy. The purpose of having an SBA is for assessing skills that are not assessable in the summative and national examinations at the end of the term, semester or a year. Furthermore, such an assessment approach is required to strengthen key components of the formative assessment, that is, to be

more valid, fair and reliable in terms of having common assessment tasks (CAT) in a more organized manner as well as creating provisions for teacher designed assessment tasks (TDAT) to meet the learning needs of learners within the school context and learning environment.

Detailed information, guidelines and appropriate weightings for SBA and internal assessment for Secondary Mathematics can be obtained from the subject prescription handbook.

Achievement Levels

Particular levels in the development of a learner towards a learning outcome; where the top level in the outcome.

Aims

Broad statement of what the curriculum of syllabus hopes that learners will achieve as a result of the learning processes

Algebraic Manipulations

Moving and shifting of variables and pronumerals in an equality with the intention of finding missing values that are represented by those pronumerals.

Assessment

Judging and describing the learning outcomes that learners have achieved.

Attitude

Ideas or beliefs in what is right and wrong, good or bad. The way think or feel about something.

CDD

Curriculum Development Division.

Concept

A cognitive unit of meaning—an abstract or idea of a mental symbol sometimes defined as a "unit of knowledge," built from other units which act as a concept's characteristics.

Competency Levels

Similar to achievement levels but usually referring to a stage in the development towards command of a particular skill.

Entrepreneurship Thinking

considering and planning to start or organise a commercial enterprise involving a financial risk.

GLO

General Learning Outcomes.

Indicator

statement of an observable behaviour which shows that a learner has achieved some level of competence on a learning outcome.

Learner Centred

An approach where the focus is on the learner or group of learners rather than on the teacher. Outcome – Based is learner centred.

Learning Outcomes

A statement which specifies what the learner is expected to know, understand or be able to do, or the attitude or values expected to have developed as a result of a learning process.

MEHRD

Ministry of Education Human Resources Development.

Numerical Calculations

Refers to the abilities to think and working with numbers using various mathematical operations to give an outcome value or quantity.

NZAid

New Zealand Aid.

Outcome Based

A curriculum or Syllabus that based on the setting and achievements of the outcomes.

PCDO

Principal Curriculum Development Officer.

Program Planner

A tool which gives an overview of the planned course of study – showing the strands and sub – strands of the overall course.

Processes

An action of taking something through an established and usually routine set of procedures or steps to convert it from one form to another, such as converting computer data from one form to another etc. A process involves steps and decisions in the way work is accomplished.

Process Skills

An action or reaction which a person performs in a competent way – with four component activities namely; perception, planning, recall of pre-requisite knowledge and execution

Rationale

Statement of the principles or reasons for the inclusion of a particular subject in the curriculum.

Scope

The extent of the understanding, concepts, skills, and attitudes or values to be acquired by a learner as a consequence of a particular course of study at a particular grand level.

Sequence

the order of the introduction or teaching of concepts and skills with in a subject, which reflect the progression of understanding or competence over a period of time.

SLO

Specific Learning Outcomes.

Spatial Visualisation

The ability to mentally manipulate 2 - dimensional and 3 - dimensional figures. It is typically measured with simple cognitive tests and is predictive of user performance with some kinds of user interface

Strand

The areas of learning into which a course is divided. Each syllabus is divided into a number of Strands which continue throughout each year of the course. Each Strand focuses on a different topic or theme within this area of learning each year. Each strand is further divided into sub – strands.

Strand Statement Concept

An overall statement of understanding, concepts, skills and attitudes intended to be acquired by learners for a particular strand of a course over a whole period of the course.

Sub – Strand

A Sub – division of a strand dealing with a particular topic within that strand.

SWG

Subject Working Group.

Syllabus

An outline and summary of topics to be covered in an education or training course. It shows the strands, sub-strands and other guidance to the teacher of how those units are covered in weeks, terms and year.

Values

Moral standards of behaviour, principles which govern a person's actions.

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