The New Senior Secondary Curriculum for Sierra Leone

Subject syllabus for Functional Mathematics
Subject stream: Mathematics and Numeracy

This subject syllabus is based on the National Curriculum Framework for Senior Secondary Education. It was prepared by national curriculum specialists and subject experts.

SSSC
Senior Secondary School Curriculum

Curriculum elements for Functional Mathematics – an everyday subject

Subject definition

Functional Mathematics (Using and Applying Mathematics in Daily Context) aims to provide skills to students which will be of use to them in their everyday lives and careers. The thematic approach will ensure that students acquire useful skills in a friendly and supportive environment where they are putting to immediate use the skills they acquire.

Rationale for the Inclusion of Functional Mathematics (Using and Applying Mathematics in Context) in the Senior Secondary School Curriculum

Functional Mathematics (Using and Applying Mathematics in Context) is part of a suite of Mathematics subjects which focuses on developing fundamental mathematics skills for life and applying these effectively in meaningful contexts. Its inclusion in the senior secondary school curriculum provides students with the opportunity to continue their mathematical education and improve their basic numeracy skills. It allows students to develop their number sense, use measures, shape and space effectively, understand and handle data, solve problems and use technology in a range of contexts. The subject allows students to further develop and apply their knowledge, skills and understanding in real-life situations, further increasing the relevance of the subject for students in their everyday lives and careers.

General Learning Outcomes

Students will be able to:

- use the strategies and processes needed to solve a wide variety of problems
- use a variety of technologies, demonstrate an understanding of technological applications, and apply appropriate technologies for solving problems
- understand and use whole numbers, fractions, decimals, and percentages
- develop understanding of ratio and proportions in real-life situations
- understand and use patterns and relationships in solving problems
- understand and use direct and indirect methods to estimate and measure
- describe the characteristics of two-dimensional shapes and simple three-dimensional objects
- find perimeters and areas of two-dimensional shapes and volumes of simple three-dimensional objects
- understand and use measures of time, including elapsed time and planning timetables
- collect, represent, and analyse data to solve problems
- use experimental or theoretical probabilities to represent and solve problems involving uncertainty

Proposed Structure of the Syllabus Over the 3-Year Senior Secondary Cycle

- A thematic syllabus bringing together the subject content of several broad themes and topics in each unit.
- Below are suggestions for unit themes and corresponding topics, which can be modified as required.
- The units are intended to focus on real-life contexts for the learning outcomes of the topics either in part or in full. They are not intended to be taught discretely but interwoven together in the units in meaningful ways.
- Several units may be needed to fulfil all the learning outcomes of a topic, with the full content to be covered by the end of the year
- Each unit to culminate with a mini-project, based on the theme, which will make use of problem solving strategies and technology where appropriate

SSS Year 1-Year 3	UNIT THEME	TOPICS
First to Third Term	**PROBLEM SOLVING** Students use a problem-solving framework to solve problems. They will understand and explore a given problem; find a strategy; use the strategy to solve the problem and look back and reflect on the solution	Problem Solving Method
	USE OF TECHNOLOGY Students use calculators and mathematical and other application software to analyse and solve problems	• Calculators • Spreadsheets • Mathematics Application Software • Drawing Application Software • Mobile Phone / Tablet Applications (Apps)
SS1	**UNIT THEME**	**TOPICS**
First Term	**MAKING CHOICES** Students make choices in daily life, for example, what to eat for lunch, what film to watch or music to listen to, what subjects to study at senior secondary school, sports and hobbies to take part in, and so on. They explore the types of data needed to make informed decisions, and collect, represent and analyse data in these and similar situations. They also explore the chance or likelihood of identified events happening in their own lives.	• Whole Numbers • Fractions and Decimals • Units Conversion • Estimate and Measure • Time • Collect, Represent and Analyse Data

	NUMBER RELATIONSHIPS Students investigate number relationships, for example what makes a set of numbers similar or different to each other and to other sets of numbers. They examine, for example, patterns in multiples or factors of numbers, and on addition and subtraction of odd and even numbers. They analyse matchstick patterns to find relationships between numbers and explore number puzzles and games. They design a (board) game, establish the rules of the game, and trial and evaluate the game against the agreed rules	• Whole Numbers • Types of Numbers • Fractions and Decimals • Shape Patterns • Number Patterns • Relationships
	SHAPING UP Students investigate two-dimensional shapes (or polygons) and their properties. They create a resource booklet with the information they gather on the following polygons: equilateral triangle, isosceles triangle, right angled triangle, scalene triangle, square, rectangle, rhombus, trapezium, kite, pentagon, hexagon, heptagon, octagon. They draw each shape and label and mark them to show properties such as equal sides, parallel sides, equal angles, right angles, etc. They label the shapes and write the formulas for their perimeter and area. They separately (i.e. not in the resource booklet) calculate missing sides, missing angles, perimeters and areas of given shapes, including composite shapes.	• Whole Numbers • Shape and Space • Estimate and measure
Second Term	**HEALTHY LIVING** Students work through a variety of activities around the theme of healthy living – nutrition, diet and exercise. Students use given information sheets and data to analyse food content and then plan healthy meals. They calculate how much calories someone of a given height and weight must consume in a day and make meal plans for them for a set budget. Students collect data from classmates, family and friends on current eating habits and exercise. They create diet and exercise plans for different people for healthy living.	• Whole Number • Fractions, Decimals and Percentages • Ratio and Proportion • Relationships • Estimate and Measure
	GROUNDS FOR FOOTBALL Students investigate the ground capacities and match attendances for various	• Whole Numbers • Percentages

	football grounds. They research on the internet to collect data such as the ground capacity for national and international stadiums, (i.e. the grounds used by football clubs), match attendances at each of the grounds for a chosen season and the record attendance (i.e. highest match attendance of all time) in each of the grounds. Students choose the most appropriate ways to represent the data collected, including rounding large numbers, before representing and analysing the data. Students find average (mean, median, mode) of ground capacities and match attendances and make comparisons between the clubs for a particular season. This unit can be adapted for other sports or appropriate athletic activity.	• Estimate and measure • Collect, Represent and Analyse Data
	3-D OBJECTS Students explore different three-dimensional objects to find out the relationship between their faces, edges and vertices. They collect everyday examples or pictures of objects, e.g. cubes (dice, sugar cube), cuboids (textbook, match boxes), regular prisms (wooden wedges), spheres (balls), pyramids (wooden or plastic), cylinders (toilet rolls, pens), cone (traffic cones, ice cream cones). Students work in pairs to sort the objects into the different types and create a table of observations for the face, edge and vertex for each type of object. Students discuss their results and try to deduce a general relationship between the face, edge and vertex of three-dimensional objects. Students draw the nets of three-dimensional objects, cut and fold to construct the shape. Students look at cubes, cuboids and other regular prisms in more detail. They define regular prisms and explore the different unique shapes of nets which make the same regular prism. Students find the volume and surface area of given prisms.	• Whole Numbers • Shape and Space • Relationships
Third Term	**ENVIRONMENTAL MATTERS** The environment is one of the most topical issues at present. Issues such as sanitation and waste management, water scarcity, deforestation, pollution in different sectors and communities, e.g. mining, fishing, agriculture, urban, town and village. Students to choose an issue to investigate from a selection provided to them.	• Whole Numbers • Percentages • Ratio and Proportion • Estimate and Measure (including

	They collect data, e.g. waste management, water availability and usage, population growth or decline in their community. Students will be guided to answer questions, present their data graphically and draw conclusions based on their data.	Temperature) • Time • Collect, Represent and Analyse Data
	OUT AND ABOUT IN THE COMMUNITY Students go on a Maths trail to find the mathematics in their home, school and community. They examine the exterior of buildings, bridges, road signs, natural environment, etc. They make diagrams, take pictures, measure angle, distances and heights of shapes they encounter, and calculate perimeters, areas and volumes of shapes and objects. They design and create a picture such as a logo, or a physical object such as a gift box, using given parameters for two-dimensional shapes and three-dimensional objects.	• Whole Numbers • Fractions and Decimals • Shape and Space • Units Conversion • Estimate and Measure (excluding Temperature) • Design and Create
	PLANNING A PARTY Students work in pairs or small groups (not more than 4) to plan a party. They decide on the number of guests (≥ 50), and determine the venue, tables and chairs, decoration, plates, cutlery and cups, food and drinks, photographer, music/DJ and other entertainment. Students create a floor plan for the venue and a seating plan for the number of guests. They include the perimeter and area and calculate the amount of space (in square metres) per guest. Students compare prices for the various items, including any discounts, and make choices according to a set budget. Students can include an events programme, with timings, for speeches and to present awards and certificates. Students can also include how to set up a dance floor area for the venue. Students can implement the plan by contributing to and throwing an end of year party based on their plan. Spreadsheets, drawing software and other technologies can be used as appropriate.	• Whole Number • Fractions, Decimals and Percentages • Ratio and Proportion • Estimate and Measures • Shape and Space • Financial Literacy • Time
SS2	**UNIT THEME**	**TOPICS**

First Term	**MARKET PRICES** Students undertake a variety of activities to build financial literacy. They design tracking sheets to investigate the changes in market prices on a number of goods over a period of several months to a year. They visit markets and supermarkets, using both local and standard measures for which to collect data. They represent the data graphically to show the trend of prices over the period under investigation. They analyse the data, for example, percentage change in the price of an item, and make predictions on future prices. Students also explore how to find and compare unit rates of various goods in the markets and supermarkets they visit to determine the "best buy" at any given time.	▪ Financial Literacy • Fractions, Decimals and Percentages • Ratio and Rates • Estimate and measure • Time • Handling Data
	TRAVEL A group of four students plan to go on an adventure to visit every district headquarter town in the country (including the capital), visit one place of interest, spend one night and then move on to another. Working in small groups, students brainstorm what it would cost to go on such an adventure. They look at issues such as cost of food, accommodation, transportation, and other expenses for four people. They plan the optimum travel route to minimise journey times and ensure they are in a different headquarter town by nightfall. After working out the cost and itinerary for the trip, students decide they want to find ways of being sponsored on the trip so they do not have to spend any money themselves, and also to raise money for charity. They develop a plan on how to go about raising funds for the adventure and sponsorship for charity. Students can implement the plan, if possible.	• Whole Number • Financial Literacy • Ratio and Rates • Units Conversions • Estimate and measure • Time
	AGRICULTURE Students investigate how mathematics is used in the agricultural sector. They first brainstorm in what areas they think mathematics is used and then choose at least two particular food crop or agricultural activity, e..g. rice, cocoa, coffee, livestock, etc. to explore in detail. Either through information sheets, internet research or visits to the relevant agencies, students find how much land, both numerically and in percentage terms, is devoted to a particular crop or activity. They find out how many workers are employed and/or required for the activity; the amount of fertilisers and other materials used; and what sort of yield farmers get from the activity.	• Whole Numbers • Fractions, Decimals and Percentages • Financial Literacy • Ratio and Proportion • Unit Conversions • Estimate and Measure (including Temperature)

	Students further explore the weather and other conditions that affect agriculture of the area, for example, amount of rainfall, availability of water, wildlife damage (e.g. elephant or locusts), drought and so on. Students will be guided to use any international figures available to quantify the costs of addressing these issues. This unit can be adapted to be more relevant to the location of the school, for example, fishing, mining, urban/town farming, etc.	• Time • Collect, Represent and Analyse Data
Second Term	**IN THE NEWS** Students collect a selection of newspaper articles which have numerical or statistical data and graphs. They work in pairs to review the data from at least 5 articles and explore questions such as: • What is the story about (e.g. health, agriculture, education)? • How is the numerical or graphical data presented (e.g. as fractions or percentages, ratios, plain numbers, etc.)? • Is it clear and easy to understand? • Is it misleading? • Has another newspaper written the story more clearly? • How can the information be improved? • etc. Students choose to improve on a number of articles (up to three), making the information and numerical data clearer and easier to understand.	• Whole Numbers • Fractions, Decimals and Percentages • Financial Literacy • Collect, Represent and Analyse Data
	KEEPING TRACK Students work through a number of activities on time. They use a conversion chart for time to convert between different times, e.g. minutes to hours or seconds, hours to days or weeks, etc. Students explore different scenarios to estimate and calculate elapsed time for everyday activities. Students use a simple timetable, for example, to plan for a journey knowing the arrival time.	• Estimate and Measure • Time
	LEISURE ACTIVITIES Students brainstorm leisure activities that they either know about or take part in	• Whole Number

	themselves. They create a recording sheet to survey classmates and other schoolmates, (≥ 50), to gather data for the leisure activities they have undertaken in the last month and how long they spent on it. Students represent and analyse the data in varying ways, for example, to show the number of students doing each activity or to show the average time they spent doing it. This investigation can be used to introduce grouping data for better graphical representation, e.g. the length of time spent on an activity can be grouped into intervals of 10 minutes with the corresponding number of students. Students then are able to calculate averages of grouped data. They also make comparison between the data such as: which activity has the most / fewest students participating; or on which activity is the most / least time spent. Students also calculate probabilities of students participating (or not) in an activity.	• Fractions, Decimals and Percentages • Estimate and Measures • Time • Handling Data
Third Term	**DESIGNING ROOMS** Students choose a room or area to design, for example, their bedroom, school quiet zone, community centre or even a whole house. They estimate / measure room dimensions and create scale drawings of plans and elevations for their room. Students work out areas and perimeters and use to find out costs of paint and flooring needed to redecorate the room. They calculate the number of people required to carry out certain tasks together with the time taken and compare the effect of varying the number of people required or the time to be taken Students explore the types of furniture and other decorating items to put in their space. They investigate the costs of different items and make choices according to a set budget. Students can use technology, for example, a drawing software, to create and design their plans and room décor.	• Whole Numbers • Fractions, Decimals and Percentages • Ratio and Proportion • Estimate and Measure • Shapes And Space • Design and Create • Time
	FOOTBALL GOALS Students choose a national, regional or international football league to investigate the goal scoring record of its clubs for a season. They collect data such as the number of goals scored by each club in each game of the season, number of home and away goals, number of games won, drawn and lost and points at various stages of the season, etc. They represent the data using tables, charts	• Whole Numbers • Fractions, Decimals and Percentages • Ratio and Proportion • Time

	and graphs and analyse the data using the various averages. Students compare the results and draw conclusions about the clubs from the results. They use this to predict the positions of the clubs in the next season. This unit can be adapted for other sports or appropriate athletic activity.	• Handling Data
	GOING GLOBAL Students explore foreign exchange transactions. They collect foreign exchange data for at least three currencies from 3-5 banks and learn how to read and interpret them. Students work out the cost of given items in the various currencies and compare the amounts from each bank's exchange rate. They investigate what happens if the currencies exchange rates changes by given percentages and calculate the new costs in each currency. Students use the internet and choose, or are given, a basket of goods (e.g. television set, sports shoes,, motorbike, etc.) to find the cost in the different currencies and to calculate the corresponding cost in leones. They evaluate and decide which currency gives the best value for money.	• Whole Numbers • Fractions, Decimals and Percentages • Ratio, Rates and Proportion • Estimate and measure • Time
SS3	**UNIT THEME**	**TOPICS**
First Term	**MONEY, MONEY, MONEY** Students become familiar with the basic mathematics of work and earnings. They differentiate wages from salaries, and learn about the minimum wage, gross pay, net pay, income tax, National Social Security and Insurance Trust (NASSIT), Goods and Services Tax (GST), interest rates, treasury bonds, insurances and other financial matters. They explore the different types of jobs in the public and private sector and how remuneration differs between the two. Students investigate average (or typical) earnings in various industries, e.g. mining, farming, teaching, law, banking, etc. They calculate income tax for various levels of income, and work out pay rises and commissions as appropriate to the sector under consideration.	• Financial Literacy • Percentages • Ratio, Rates and Proportions
	MOVING ON Students learn about budgeting and its importance in planning for university. They estimate their income from scholarships, loans, earnings, family assistance, etc. They explore interest rates and the cost of credit as related to obtaining a loan for	• Whole Numbers • Fractions, Decimals and Percentages

	university expenses. Students calculate other expenses such as fees, housing, food, transport and other costs of attending university. Students then create a budget for university income, expenses and savings.	• Financial Literacy • Ratio, Rates and Proportion • Collect, Represent and Analyse Data
	ENTREPRENEURSHIP Students undertake a variety of activities to do with starting a business, (which can be online if necessary). They brainstorm different types of businesses and choose one to investigate in more detail. Students visit premises of the identified business, if possible, and use prepared recording sheets to record information gathered Local entrepreneurs for each business type are invited to give insights to the business, costs involved, benefits and potential pitfalls of the business. Students learn about business plans, market research, capital investment, location, fixed and running costs, employee costs (if any), cash flow, marketing, etc. Students use the information to draw up their own business plan, including projected income and expenditure for up to 3 years. They use guided activity sheets, spreadsheets and any other appropriate technology in preparing their business plans.	• Financial Literacy • Percentages • Ratio, Rates and Proportion • Time • Collect, Represent and Analyse Data
Second Term	**PLANNING A STUDY TIMETABLE** Students plan a study timetable for their final examinations, taking into account the number of subjects, the hours available, rest time and other commitments. Students use technology, including apps which gives alerts for start and end times of study sessions, to create their timetables.	Time
	REVISION Revision for exam	All topics

Teaching Syllabus

Topic/Theme/Unit	Expected learning outcomes	Recommended teaching methods	Suggested resources	Assessment of learning outcomes
SENIOR SECONDARY SCHOOL – YEAR 1				
NUMBERS AND NUMBERS OPERATIONS Whole Numbers	Students will be able to: Read and write whole numbers up to one million in numeral and word form Order and compare whole numbers up to one million in everyday texts or simple tables Use multiplication and related division facts Add, subtract, multiply and divide whole numbers up to one million Follow the order of operations to evaluate numerical expressions Multiply and divide whole numbers by 10, 100, 1000 Round numbers to the nearest 10, 100, 1000	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Read numbers in everyday documents and contexts, e.g. tables, diagrams, charts, articles, advertisements Use both positive and negative numbers in simple multi-step calculations Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the thematic unit booklets

	Recognise positive and negative numbers and use them in calculations Use simple formulae expressed in words for one or two-step operations Apply whole numbers to solve real-life problems			
NUMBERS AND NUMBERS OPERATIONS Types of Numbers	Students will be able to: Identify and use odd and even numbers Identify and use factors and multiples whole number Identify and use the divisibility rules for numbers less than 10 Identify and use prime and composite numbers Find the least common multiple of three or more whole numbers Find the highest common factor of three or more whole numbers			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	Calculate the squares of one- and two-digit numbers			
NUMBERS AND NUMBERS OPERATIONS Fractions, Decimals and Percentages	Students will be able to: Read and write common fractions, mixed numbers and decimals up to three decimal places in numeral and word form Order and compare common fractions, mixed numbers and decimals up to three decimal places in everyday texts or simple tables Simplify fractions to lowest terms Find fractions of whole number quantities or measurements Add, subtract, multiply and divide common fractions and decimals up to two decimal places Multiply and divide decimals by 10, 100, 1000 Follow the order of			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	operations to evaluate numerical expressions Round decimals to a whole number or to one or two decimal places Estimate answers to calculations using fractions and decimal Find percentages of quantities or measurements Calculate simple percentage increases and decreases Convert between fractions, decimals and percentages Apply fractions, decimals and percentages to solve real-life problems			
PATTERN AND RELATIONSHIPS Shape Patterns Number Patterns	Students will be able to: Describe and predict the next term of a spatial pattern Create a spatial pattern Describe and predict the	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	next term of a simple number pattern Create a simple arithmetic number pattern	the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's contexts		
PATTERN AND RELATIONSHIPS Relationships	Students will be able to: Identify and state the relationship in words between two given number sets Find corresponding elements of one set given elements from the other Find and use the rule connecting two related sets of numbers Identify, describe and represent a variety of relationships between numbers			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
FINANCIAL LITERACY Simple Money Calculations	Students will be able to: Perform simple calculations using money Understand simple fractions as applied to spending money	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format:	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	Estimate and calculate correct change in simple personal financial transactions	• Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context		
FINANCIAL LITERACY Consumer Transactions	Students will be able to: Know and use the formula for calculating simple interest Compare the price of a set of goods purchased at a number of similar markets or shops Track and give examples of change in cost of goods over time in identified marketplaces			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
RATIO AND PROPORTION Ratio	Students will be able to: Use ratio to describe relationships between two quantities Understand the difference between fractions and ratios Simplify ratio to lowest terms Find the ratio of two quantities in various	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct	Calculators Computers Thematic Unit booklets Textbooks Measuring Instruments, e..g metre	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	contexts Divide a number into a given ratio find values of individual terms in a ratio	teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context	rule, scales	
RATIO AND PROPORTION Direct Proportion	Students will be able to: Identify and find missing elements in equivalent ratios Understand direct proportion and use equivalent ratios to solve for proportions in different contexts Apply ratios and proportions to solve real-life problems			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
MENSURATION Estimate and Measure Unit Conversions	Students will be able to: Estimate and measure length, distance, mass and weight in everyday situations Use and convert between units of length, weight and capacity in the metric system Choose the most	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the	Calculators Computers Thematic Unit booklets Textbooks Two-dimensional shapes	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	appropriate unit to measure objects Use and convert between Celsius and Fahrenheit *temperature* scales	activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context relevant to the students' and community's context	Three-dimensional objects Scales	
MENSURATION Shape and Space Design and Create	Students will be able to: Describe, name and draw common two-dimensional shapes Understand and apply the properties of common two-dimensional shapes Calculate the perimeter and area of common and composite two-dimensional shapes Describe, name and draw common three-dimensional objects. Design and construct nets for common three-dimensional objects			

	Calculate the volumes of cubes, cuboids and regular prisms			
MENSURATION Time	Students will be able to: Convert between units of time Estimate the time taken for daily activities Calculate elapsed time for everyday activities Create a timetable for a simple event			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Collect Data	Students will be able to: Understand different types of data (qualitative and quantitative, primary and secondary, discrete, and continuous) Collect simple data using observations, questionnaires and surveys Record simple data using tally charts and simple tables	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Represent Data	Students will be able to:			Students are able to:

	Recognise features of charts to summarise and compare sets of data Represent simple data in tables, diagrams and charts	misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context relevant to the students' and community's context		Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Analyse Data	Students will be able to: Extract and interpret information from tables, diagrams and bar charts Find the mean of a set of data Find the range of a set of data			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Probability	Students will be able to: Discuss events as likely or unlikely Describe the degree of likelihood of an event occurring in informal terms (e.g. unlikely, very unlikely, certain, impossible) Understand probability on a scale from 0 (impossible) to 1 (certain) Use simple experiments to			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	estimate and describe probabilities of events. Use sample space to illustrate and find the theoretical probabilities of simple events			
SENIOR SECONDARY SCHOOL – YEAR 2				
NUMBERS AND OPERATIONS Whole Numbers	Students will be able to: Read and write positive and negative numbers of any size in numeral and word form Order and compare positive and negative numbers of any size in familiar and unfamiliar contexts Add, subtract, multiply and divide positive and negative numbers (up to one million) Understand and use approximation, rounding, estimation and reverse operations to check calculations Substitute values for variables in a formula or expression and evaluate	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	Follow the order of operations to evaluate formulae, expressions and multi-step calculations Apply positive and negative numbers to solve real-life problems	activities relevant to the students' and community's context		
NUMBERS AND OPERATIONS Fractions, Decimals and Percentages	Students will be able to: Read and write proper and improper fractions, mixed numbers and decimals numbers of any size in numeral and word form Order and compare proper and improper fractions, mixed numbers and decimals of any size in everyday texts or simple tables Simplify proper and improper fractions and mixed numbers to their lowest terms Express one number as a fraction of another Add, subtract, multiply and			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	divide proper and improper fractions and decimals of any size Understand and use approximation, rounding, estimation and reverse operations to check calculations Substitute fraction and decimal values for variables in a formula or expression and evaluate Follow the order of operations to evaluate formulae, expressions and multi-step calculations Find percentages of quantities and measurements Express one amount as a percentage of another Calculate percentage increase and decrease of any size Calculate the original value after a percentage change			

	Convert between fractions, decimals and percentages Apply fractions, decimals and percentages to solve real-life problems			
PATTERNS AND RELATIONSHIPS Number Patterns	Students will be able to: Describe and predict the next *n* terms of arithmetic number patterns Create an arithmetic number pattern and list the first *n* elements of the pattern Describe and predict the next *n* terms of simple geometric number patterns	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's contexts	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
PATTERNS AND RELATIONSHIPS Relationships	Students will be able to: Complete a table of values connecting an element and its position in an arithmetic number pattern Use a table of values to find a rule for the relationship between an element and its position in an arithmetic number pattern			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	Draw a graph showing the type of relationship between an element and its position in the arithmetic number pattern Use the rule or graph to predict the value of any element given its position in the arithmetic number pattern Identify, describe and represent a variety of relationships between numbers			
FINANCIAL LITERACY Personal Money Calculations	Students will be able to: Perform money calculations with confidence, including transactions with mobile money Find fractions and percentages of money amounts, including percentage increases and decreases in different contexts Estimate and calculate savings on simple	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	discounted purchases Estimate and construct a simple personal budget for a specific goal Use a spreadsheet or budget app to keep track of spending and savings plans	• Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context		
FINANCIAL LITERACY Consumer Transactions	Students will be able to: Know and use the formula for calculating compound interest Identify the range of common credit and debt products from banking institutions Understand and apply the basic goods and services tax on consumer products Track and give examples of change in cost of goods over time in identified marketplaces use foreign exchange rate information to make calculations, including calculations for currency			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	exchange with commission or a fee			
RATIO, RATES AND PROPORTION Ratio Rates	Students will be able to: Extend understanding of ratio to unit ratios Describe unit rate and explain its uses Calculate unit rate in various real-life contexts	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for each activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
RATIO, RATES AND PROPORTION Direct Proportion Indirect Proportion	Students will be able to: Identify direct and indirect proportions Understand how variables are related in direct and inverse proportion Understand the role of the constant in direct and inverse proportion Solve real-life problems involving direct and inverse proportion			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
MENSURATION Basic Concepts	Students will be able to: Recall basic concepts to estimate, measure and use units of length, distance,	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied	Calculators Computers	Students are able to: Complete activities specified in the Thematic Unit booklets

Unit Conversions Discrete and Continuous measures	mass and weight in the metric system Use a scale given as a ratio and convert between units Recognise and make use of simple scales on maps and drawings Understand and use discrete and continuous measures	by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context relevant to the students' and community's context	Thematic Unit booklets Textbooks Measuring Instruments, e.g., metre rule, scales	Complete assessments as directed in the Thematic Unit booklets
MENSURATION Shapes And Space Design and Create	Students will be able to: Find the perimeter and area of simple and composite two-dimensional shapes Calculate the volume of three-dimensional shapes, using given formulae where necessary Calculate the surface area of cubes, cuboids and regular prisms Calculate using correct units to a required level of accuracy Calculate actual dimensions			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	from given scale diagrams Create a scale diagram using actual measurements			
MENSURATION Time	Students will be able to: Convert between digital and analogue time Compare 12- and 24-hour time systems and convert between them Calculate elapsed time for everyday activities Use bus timetables to compare different ways of making the same journey Create a timetable for an event			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Collect Data	Students will be able to: Collect specified data using observations, measurements, questionnaires, surveys, or experiments Record data using tally charts, tables and forms	The mathematical content for this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes		Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA	Students will be able to:			Students are able to:

Represent Data	Represent discrete data in tables, diagrams, bar charts and pie charts Group discrete data and represent grouped data graphically	• Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context relevant to the students' and community's context		Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Analyse Data	Students will be able to: Extract and interpret information from tables, diagrams, charts and graphs Calculate the mean, median and mode of a set of discrete data Estimate the mean of grouped data Identify the median and modal group of grouped data Use the real or estimated averages to compare two or more sets of data			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
Probability	Students will be able to: Find the probability of combined events			

	Use sample space and simple tree diagram to illustrate and find the theoretical probabilities of simple events			
SENIOR SECONDARY SCHOOL – YEAR 3				
FINANCIAL LITERACY Personal Money Calculations	Students will be able to: Use percentages to solve financial problems including gross pay, net pay, income tax, NASSIT, pay rises and commissions Discuss the implications of credit as related to obtaining a loan for university expenses Understand the fundamentals of a budget, including income, expenses, and savings Create a budget for university income, expenses, and savings Substitute numerical values into formulae, spreadsheets and financial expressions Follow the order of	The mathematical content of this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources • Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	operations to evaluate numerical expressions Find approximate solutions to problems in financial contexts			
FINANCIAL LITERACY Consumer Transactions	Students will be able to: Recall and apply simple and compound interest to financial transactions			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Collect Data	Students will be able to: Recall and extend understanding of qualitative and quantitative data, primary and secondary data, discrete, and continuous data Collect and record data using observations, measurements, questionnaires, surveys, or experiments	The mathematical content for this syllabus is taught through thematic activity booklets. Each Thematic Unit booklet will be accompanied by a detailed Teacher Guide which will follow the same format: • Notes to the teacher outlining the activity (or activities), its context and learning outcomes • Underpinning skills for the activity which may include direct teaching, discussions, demonstrations and exercises • Clearing common misconceptions • Thematic Unit and resources	Calculators Computers Thematic Unit booklets Textbooks	Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Represent Data	Students will be able to: Represent grouped discrete and/or continuous data in the appropriate formats			Students are able to: Complete activities specified in the Thematic Unit booklets

	(tables, diagrams, bar charts and pie charts, histograms, cumulative frequency graphs, etc.) Understand that representation of data can be used to mislead or misinform.	• Extension opportunity The teaching guide will provide a framework for teachers to plan their own appropriate additional teaching, learning and assessment activities relevant to the students' and community's context relevant to the students' and community's context		Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Analyse Data	Students will be able to: Extract and interpret information from tables, diagrams, charts and graphs Calculate or estimate the appropriate averages of a set of data Use the averages to compare sets of data Identify which average is the best fit for a given set of data			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets
HANDLING DATA Probability	Students will be able to: Recall and find the probability of combined events (including the use of diagrams and tables)			Students are able to: Complete activities specified in the Thematic Unit booklets Complete assessments as directed in the Thematic Unit booklets

	Recall and use sample space and simple tree diagram to illustrate and find the theoretical probabilities of simple events			

RESOURCES

- Problem Solving guide
- Teacher guides
- Thematic Unit booklets
- Calculators
- Computers
- Spreadsheet application
- Mathematical application software e.g. Microsoft Mathematics
- Drawing application software e.g. Sketcher
- Mobile phone or tablet application, e.g. Khan Academy, Photomath
- Two-dimensional shapes
- Three-dimensional objects
- Measuring Instruments, e.g., metre rule, scales